DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Submitted in support of an Application for a Mining Right and Environmental Authorisation

PREPARED ON BEHALF OF:

NAKEDI SOLUTIONS (PTY) LTD

AS PER SECTION 79(4) OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 OF 2002) AND SECTION 21 OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998).

DMRE REFERENCE NUMBER: LP30/5/1/1/3/2/1/10218MR

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JUNE 2022

mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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).

NAME OF APPLICANT: NAKEDI SOLUTIONS (PTY) LTD

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FILE REFERENCE NUMBER SAMRAD: LP30/5/1/1/3/2/1/10218MR

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 proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify 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

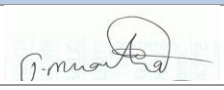
(cc) can be avoided, managed or mitigated;

i. identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

ii. identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

iii. identify suitable measures to manage, avoid or mitigate identified impacts; and (h) identify residual risks that need to be managed and monitored.

Document Control Section

Report Issue	Draft	
Reference Number	LP30/5/1/1/3/2/1/10218MR	
Title	Nakedi Solutions (Pty) Ltd Application for a Mining Right at Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR, situated at approximately 170 km North-West of Mokopane Town as well as at approximately 15 km north east of Baltimore Town which is along N11, in the Limpopo Province.	
	Name	Signature
1. Document Authorisation (Reviewed)	Mantsepuoa Bolofo	
Credentials	N. Dip Environmental Sciences, Risk Assessment Certificate, Hydropedology & Wetlands Certificate and SAMTRAC.	
Area of Experience:	Environmental Impact Assessments (BAR and Scoping & EIR), Water Use License Applications, EMPr, Environmental Monitoring and Evaluation as well as Section 24G Rectifications.	
Number of Years' Experience:	7	
Date	13-June -2022	
2. Document Authorisation (Compiled)	Name	Signature
Credentials	Murendeni Neluvhalani	
Credentials	Bachelor of Earth Sciences in Mining and Environmental Geology (Hons)	
Area of Experience:	WUL, EIA, EMP, BAR, Exploration, Geotechnical Investigations and Mining Prospecting Rights Applications	
Number of Years' Experience:	11	
Date	15-June -2022	

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PART A

1. SCOPE OF ASSSSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1.1 Contact Person and correspondence address

a) Details of EAP

i) Details of the EAP

Table 1-1: EAP details

EAP	Mantsepuoa Bolofo	Murendeni Neluvhalani
Qualifications	N. Dip Environmental Sciences	Bachelor of Earth Sciences in Mining and environmental Geology
Telephone Number	067 027 8059	076 977 9312
Fax	086 272 4330	086 272 4330
E-mail	Mnbholdings17@gmail.com	Mnbholdings17@gmail.com
Number of Years in field	**7**	11
Field of Expertise	EIA, EMP, Public Participation Processes, Section 24G, Rectifications, ECO, Mining Permits, Prospecting and Mining Rights applications.	Geology, Environmental Sciences, Geotechnical Engineering, Public Participation, EIA, Basic Assessment Reports.

ii) Expertise of the EAP.

(1) **The qualifications of the EAP**

(with evidence).

Ms Bolofo and Ms Neluvhalani have a combined experience of more than 17 years amongst the two of them. Their experiences range from conducting and compiling:

Environmental Impact Assessment Reports (BAR, EIA, Scoping report) Environmental Audits and Monitoring, Biodiversity, Geotechnical Engineering, Exploration, Conducting Public Participation Process, Environmental Authorization, Water Use Licence, Mining & Prospecting Rights and Mining Permit applications.

(2) **Summary of the EAP's past experience**.

Kindly see annexure 10 for the CV

Executive Summary

Nakedi Solutions (Pty) Ltd (hereafter referred to as "Nakedi Solutions", the Applicant) is a 100% black owned organization and would like to enter the mining sphere and environment in order to develop and be a role player in the mining sphere but more specifically in the Granite/ Syenite and General Dimension Stone industry. This will also deal with the stereotype that mining is for the elite few while also building the ficsus of the country, creating employment and revenue. Nakedi Solutions holds a prospecting right and as such proposes to establish an open pit mine which will involve the development of open pits and associated mine infrastructure. Commodities to be mined include Iron ore, Manganese, Gemstone and Silica.

In order to undertake the proposed mining and associated activities, Nakedi Solutions requires a Mining Right (MR) in terms of Section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002, as amended) (MPRDA). In accordance with the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) and Waste Regulations as well as the National Water Act, 1998 (Act 36 of 1998) (NWA), the following environmental permitting and licensing processes are required:

- Undertaking the Public Participation Process;
- Compilation of an Integrated Environmental Authorisation Application;
- Compilation of Scoping and Environmental Impact reports;
- Development of an Environmental Management Programme;
- Submission of an Integrated Water Use License Application; as well as

Nakedi Solutions has therefore appointed MNB Holdings (Pty) Ltd (herein referred to as MNB Holdings) as their independent Environmental Assessment Practitioner (EAP), to conduct an Environmental Impact Assessment (including the identification of all related specialist studies) as well as obtain an Environmental Authorisation (EA) with respect to the applied Mining Right; in terms of the MPRDA and NEMA regulations.

MNB Holdings has then submitted an application for a Mining Right and Environmental Authorisation to the Department of Mineral Resources and Energy (DMRE), Limpopo Regional Manager in May 2021. This application was allocated the Mining Right reference number LP 30/5/1/1/3/2/1/10218 MR and subsequently accepted on the 30th of November 2021.

Nakedi Solutions has applied for a mining right covering 2 662Ha in size for various commodities; namely Iron ore, Manganese, Gemstone and Silica within the area of Baltimore. The applied Mining Right covers Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR.

MNB Holdings is set to conduct a Public Participation process for the EIR & EMPr phase and this will include a public meeting on behalf of Nakedi Solutions. The process will be subjected to a 30 days public participation process in order to include and also receive views of the I&APs views and comments.

To cater for both affected communities in the surrounding vicinity of the applied Mining Right area, two Public Participation Process (PPP) meetings were held on the 24th April 2022at Baltimore Primary School as well as at Sekhung Combined School (Tolwe) respectively. While site notices were placed on the affected Farms as well as adjacent locations on the 27th March 2022, the newspaper advertisement relating to the foresaid meeting has been advertised on the Beeld Newspaper. Individual letters to various Interested and affected parties were sent out. Comments and views from various I&APs will be incorporated into the Final EIR & EMPr and subsequently be submitted to the DMR.

There were various specialist studies identified and some of which were conducted while others are on-gong or yet to be conducted, these are:

- Water Use Licence (*pending*)
- Ecological Studies *(Draft Completed)*
- Heritage Studies *(Draft Completed)*
- Ground and Surface Water Studies (*pending*)
- Traffic Assessment Report *(Draft Completed)*
- Air Quality and Dust Management *(Draft Completed)*
- Blasting and Vibration *(Draft Completed)*
- Geotechnical Studies *(Draft Completed)*

The general recommendations of these studies show that the project can go on with certain conditions which must be imposed and/or implemented. See the attached summarised studies on the EIA document as well as a comprehensive report attached on the Annexures

Legal requirements and legislative process

As part of the proposed Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Project, listed activities defined under the National Environmental Management Act, Act 107 of 1998 (NEMA, 1998) and the regulations there under will take place. Relevant listed activities triggered by the proposed activities are described further in this EIA Report. It is the intention of this EIA Report to provide the necessary information pertaining to the proposed activities associated with the project, as required in terms of the Environmental Impact Assessment Regulations (EIA Regulations R543: EIA Regulations in terms of Chapter 5 of the NEMA, 1998, dated June 2010) under the NEMA, 1998.
This Report intends to highlight information relevant to the proposed Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Project. The compilation of an Integrated Water Use License Application (IWULA) for the relevant water uses under Section 21 of the National Water Act, 1998 (NWA), associated with the operation is yet to be conducted and will be submitted to the Department of Water Affairs (DWA) as well as the various I&APs for comments and inputs.

Nakedi Solutions submitted an application for a mining right in terms of Section 39 and of Regulations 50 and 51 of the Mineral and Petroleum Resources Development Act (MPRDA), 2002, (Act No. 28 of 2002). The Environmental Management Programme (EMP) report is being submitted to the Department of Mineral Resources (DMR) on 13 May 2021. The diagram below provides a visual representation of the Scoping- and EIA approach followed in terms of NEMA, 1998 and the Environmental Impact Assessment Regulations, dated 2010.

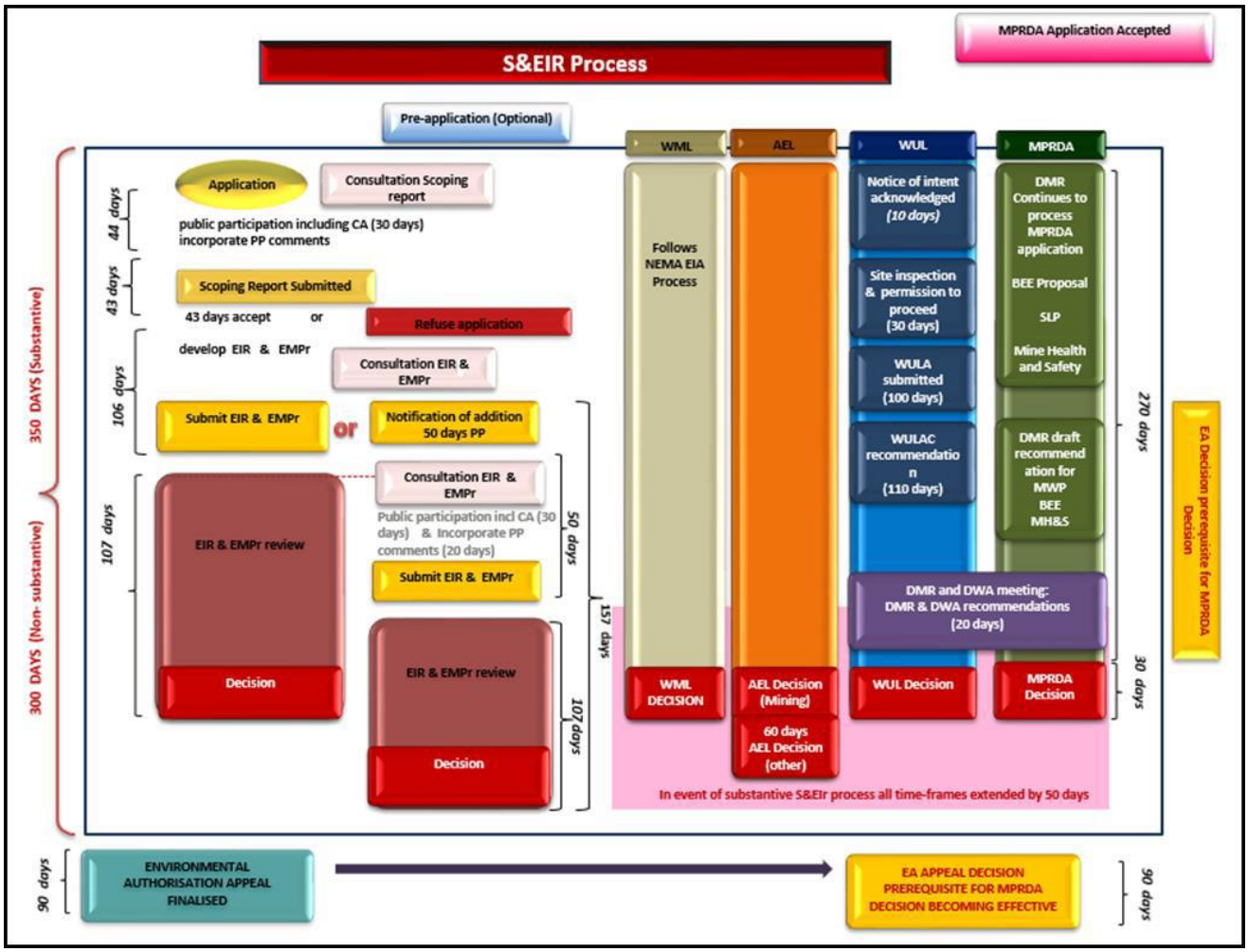


Figure 1: The EIA process

Definitions

The National Environmental Management Act (NEMA) and the National Environmental Management Waste Act (NEM: WA) provide definitions which are pertinent to the management of waste.

‘‘**acceptable exposure’’** means the exposure of the maximum permissible concentration of a substance to the environment that will have a minimal negative effect on health or the environment.

“**Activity**” means an activity identified in any notice published by the Minister or MEC in terms of section 24D (1) (a) of the Act as a listed activity or specified activity.

“**best practicable environmental option**” means the option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term.

“**Commence**” means the start of any physical activity on the site in furtherance of a listed activity.

“**Community**” means any group of persons or a part of such a group who share common interests and who regard themselves as a community.

‘‘**Constitution**’’ means the Constitution of the Republic of South Africa, 1996.

‘‘**containe**r’’ means a disposable or re-usable vessel in which waste is placed for the purposes of storing, accumulating, handling, transporting, treating or disposing of that waste, and includes bins, bin-liners and skips;

“**cumulative impact**”, in relation to an activity, means the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

‘‘**disposal**’’ means the burial, depositing, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.

“EAP” means an Environmental Assessment Practitioner as defined in section 1 of the Act;

“Environment” means the surroundings within which humans exist and that are made up of:

I. the land, water and atmosphere of the earth;

II. micro-organisms, plant and animal life;

III. any part or combination of (i) and (ii) and the interrelationships among and between them; and

IV. the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

“Environmental authorisation”, means the authorisation by a competent authority of a listed activity in terms of this NEMA;

“environmental impact assessment”, means a systematic process of identifying, assessing and reporting environmental impacts associated with an activity and includes

basic assessment and S&;EIR;

‘‘environmentally sound management’’ means the taking of all practicable steps to ensure that waste is managed in a manner that will protect health and the environment; **‘‘extended producer responsibility measures’’** means measures that extend a person’s financial or physical responsibility for a product to the post-consumer stage of the product, and includes:

a) waste minimisation programmes;

b) financial arrangements for any fund that has been established to promote the reduction, re-use, recycling and recovery of waste;

c) awareness programmes to inform the public of the impacts of waste emanating from the product on health and the environment; and

d) any other measures to reduce the potential impact of the product on health and the environment;

‘‘general waste’’ means waste that does not pose an immediate hazard or threat to health or to the environment, and includes:

a) domestic waste;

b) building and demolition waste;

c) business waste; and

d) inert waste;

‘’hazardous waste’’ means any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment;

‘‘high-risk activity’’ means an undertaking, including processes involving substances that resent a likelihood of harm to health or the environment;

‘‘holder of waste’’ means any person who imports, generates, stores, accumulates transports, processes, treats, or exports waste or disposes of waste;

“Independent”, in relation to an EAP or a person compiling a specialist report or undertaking a specialised process or appointed as a member of an appeal panel, means—

a) that such EAP or person has no business, financial, personal or other interest in the activity, application or appeal in respect of which that EAP or person is appointed in Final Environmental impact report for the than fair remuneration for work performed in connection with that activity, application or appeal; or

b) that there are no circumstances that may compromise the objectivity of that EAP or person in performing such work;

‘‘inert waste’’ means waste that:

a) does not undergo any significant physical, chemical or biological transformation after disposal;

b) does not burn, react physically or chemically biodegrade or otherwise adversely affect any other matter or environment with which it may come into contact; and

c) does not impact negatively on the environment, because of its pollutant content and because the toxicity of its leachate is insignificant;

“Listed activity”, means an activity identified in terms of section 24(2) (a) and (d) of the

NEMA;

Nakedi Solutions (Pty) Ltd” means the Mining Right Applicant for the project

‘‘MNB Holdings (Pty) Ltd’ means the Environmental Consulting Company (EAP) for the project

“plan of study for environmental impact assessment” means a document contemplated in [regulation 28(1)(l)] regulation 28(1)(n), which forms part of a scoping report and sets out how an environmental impact assessment must be conducted;

“Pollution” means any change in the environment caused by -

i. substances;

ii. radioactive or other waves; or

iii. Noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or wellbeing or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future;

‘‘priority waste’’ means a waste declared to be a priority waste in terms of section 14 of the

NEM: WA;

“Registered interested and affected party”, in relation to an application, means an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 55;

“Significant impact” means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment;

“Specialised process” means a process to obtain information which—

a) is not readily available without undertaking the process; and

b) is necessary for informing an assessment or evaluation of the impacts of an activity, and includes risk assessment and cost benefit analysis;

"State department" means any department or administration in the national or provincial sphere of government exercising functions that involve the management of the environment;

"Sustainable development" means the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure that development serves present and future generations;

''storage'' means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste;

''waste'' means any substance, whether or not that substance can be reduced, re-used, recycled and recovered—

a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;

b) which the generator has no further use of for the purposes of production;

c) that must be treated or disposed of; or

d) that is identified as a waste by the Minister by notice in the Gazette, and includes waste generated by the mining, medical or other sector, but—

i. a by-product is not considered waste; and

ii. any portion of waste, once re-used, recycled and recovered, ceases to be waste;

''waste disposal facility'' means any site or premise used for the accumulation of waste with the purpose of disposing of that waste at that site or on that premise;

''waste management activity'' means any activity listed in Schedule 1 of the NEM: WA or published by notice in the Gazette under section 19;

''waste management control officer'' means a waste management control officer designated under section 58(1) under NEM: WA;

''waste management licence'' means a licence issued in terms of section 49 of the NEM:

WA;

''waste management services'' means waste collection, treatment, recycling and disposal services

List of Acronyms/Abbreviations

AEL – Air Emissions License

AMD –Acid Mine Drainage

ADT- Articulated Dump Truck

ASAPA – Association of Southern African Professional Archaeologists

AQIA – Air Quality Impact Assessment

AQMP – Air Quality Management Plan

AOD – Argon Oxygen Decarbonisation

ASU – Air Separation Unit

BID – Background Information Document

BPG – Best Practice Guide

CDM – Capricorn District Municipality

CEMPr – Construction Environmental Management Program

CM-Correct Medium

CPI – Consumer Price Index

DM – Dilute Medium

DFFE – Department of Forestry, Fisheries & Environmental Affairs

DMRE – Department of Mineral Resources & Energy

DWA – Department of Water Affairs

DOT – Department of Transport

DSR-Draft Scoping Report

EAF – Electric Arc Furnace

ECO- – Environmental Control Officer

EIR – Environmental Impact Report

FEL – Front End Loader

GDP – Gross Domestic Product

HCS – Hazardous Chemical Substances

HDPE-High Density Polyethylene

I&AP – Interested and Affected Party/ies

IPPC – Integrated Pollution Prevention Control

IWMP - Industrial Waste Management Plan

LEDET – Limpopo Department of Economic Department, Environment and Tourism

LOM-Life of Mine

LIHRA-Limpopo Heritage Resources Authority

MPRDA – Mineral and Petroleum Resources Development Act

NAAQS – National Ambient Air Quality Standards

NEMA- National Environmental Management Act

NHRA –National Heritage Resources Act

PCD-Pollution Control Dams

PPE-Personal Protective Equipment

PPP-Public Participation Process

PVC- Polyvinyl chloride

ROM-Run of Mine

SAHRA – South African Heritage Resource Agency

SANS- South African National Standards

SEP – Stakeholder Engagement Plan

TIA – Traffic Impact Assessment

TSP – Total Suspended Particulate

TOPS – Threatened or Protected species

WWTW – Wastewater Treatment Works

b) Description of the property, in particular area where EA is done

The proposed Iron ore, Manganese, Gemstone and Silica mining right application covers 2 662Ha in total on all the mentioned Properties; Baden Farm Baden 90LR; and Portion of portion 0 of the farm Bronkhorsfontein 42LR respectively.

The proposed study area is accessible via a tarred N11 National road, the R561 tar road into Tolwe then into gravel roads leading into the farms.

Farm Name:	• Farm Baden 90LR; and • Portion of portion 0 of the farm Bronkhorsfontein 42LR	
Application area (Ha)	2 662 Ha	
Magisterial district:	Capricorn District Municipality	
Distance and direction from nearest town	The proposed mining area is situated at approximately 170 km North-West of Mokopane Town as well as at approximately 15 km north east of Baltimore Town respectively.	
21 digits Surveyor General Code for each farm portion	**Farm Name/Portion:**	**SG Codes:**
	Baden 90LR	T0LR00000000004200000
	Portion of portion 0 of the farm Bronkhorsfontein 42LR	T0LR00000000009000000
Locality map	Attach a locality map at a **scale not smaller than 1:250000 and attach as Appendix-Maps**	

c) Locality map

(Show nearest town, scale not smaller than 1:250000).

The proposed mining area is located at approximately 170 km North-West of Mokopane Town as well as at approximately 15 km north east of Baltimore Town which is along N11, in the Limpopo Province. This falls under the jurisdiction of the Blouberg Local Municipality of the Capricorn District; Limpopo Province.

Figure 2: Locality map indicating the applied farms/ portions

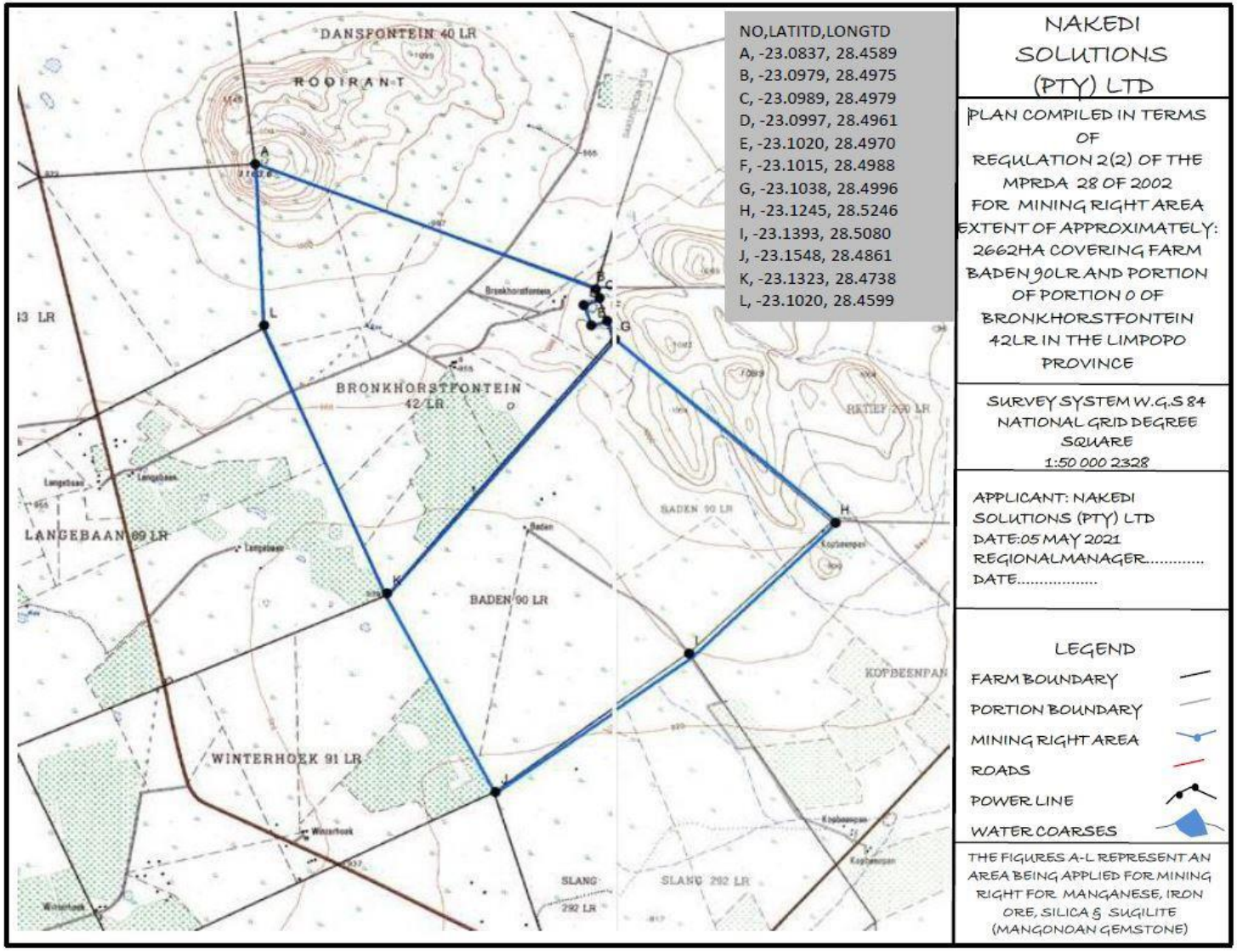


Figure 3: Reg. 2.2 map indicating the application area (refer to Appendix D for an enlarged map).

d) Description of the scope of the proposed overall activity.

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

The map below illustrates the extent of the farms to be affected by the proposed mining activities.

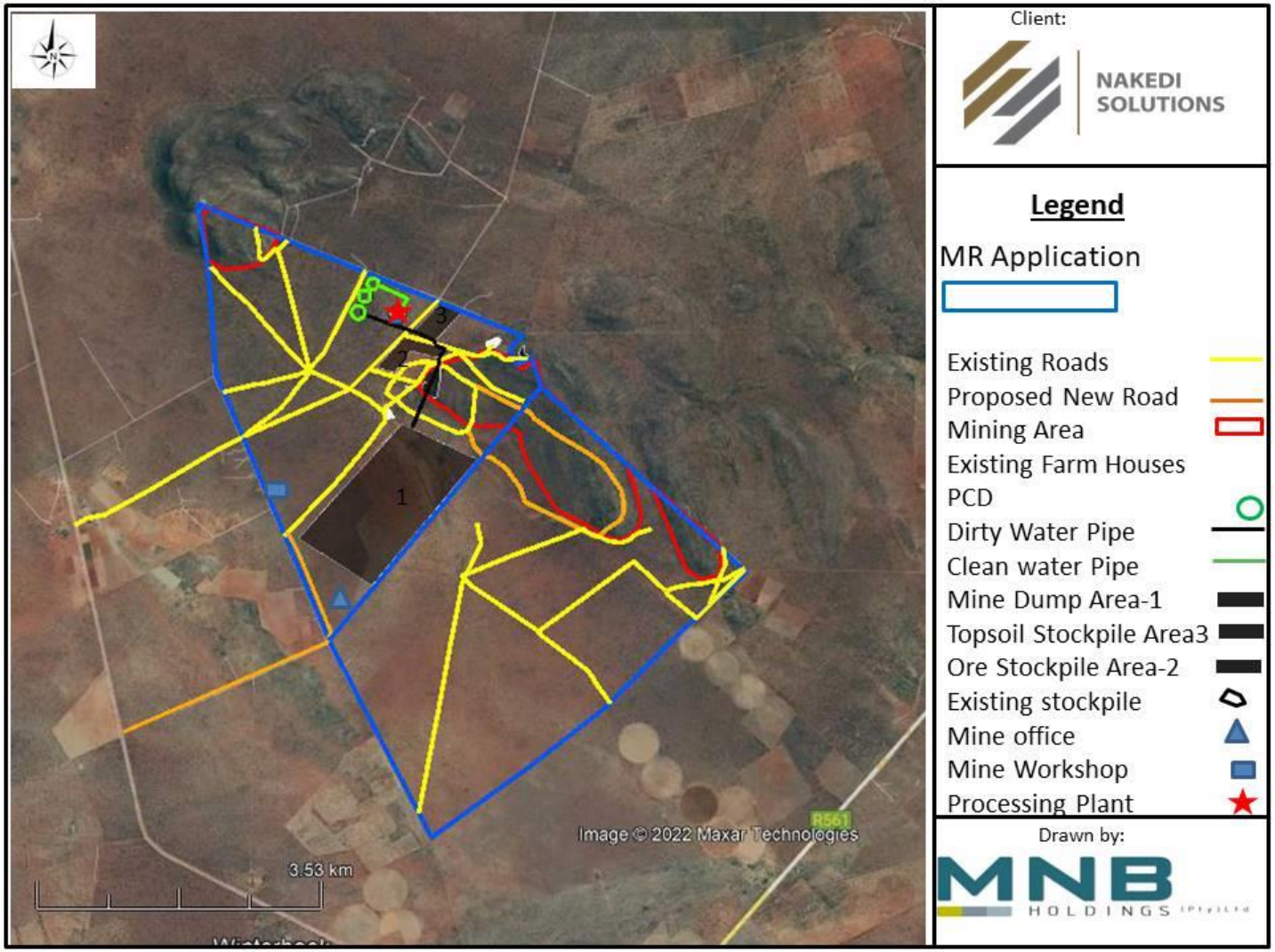


Figure 4: Activity Map

(i) Listed and specified activities

Name of activity	Arial Extent of the activity (Ha or M^2)	Listed Activity (mark with an X)	Applicable Listing Notice (GNR 327, GNR 326 or GNR 985/Not Listed
Clearance of Vegetation	110Ha	x	Activity 15 of Listed Notice 2 GNR 325
Removal of Topsoil and overburden	105Ha	x	Activity 15 of Listed Notice 2 GNR 325
Mining	100-300Ha	x	Activity 17 of Listing Notice 2 GNR 325
Topsoil Stockpile	5Ha		Not Listed
Construction of a road	300m	x	Activity 56 of Listing Notice 1 GNR 327
Crushing and Screening of Material		x	Activity 21 of Listing Notice 2 GNR 325
Usage of Chemical Toilets			Not Listed
Earth works: Stripping and stockpiling topsoil and sub-soil and the establishment of a topsoil stockpile area and berm	Vary in size	x	GNR 327 (Activity 27, 28 and 30) GNR 325 (Activity 15 and 17)
Civil Works: General Building Activities Foundation Excavations and compaction Mixing of concrete Steel works	Vary in size	x	As Above
Blasting and Mining		x	GNR 35 (Activity 17 and 19)

Transport: • Establishment of main and internal access and maintaining roads		x	GNR 325 (Activity 17 and 27) GNR 327 (Activity 24 and 28)
Water Supply use and Management: • Establishment of water supply boreholes • Establishment of sewage and water Treatment plants		x	GNR 327 (Activity 27 and 28) GNR 325 (Activity 15 and 17) GNR 327 (Activity 10, 25, 27 and 28) GNR 325 (Activity 15 and 17)
Power Supply and Use: • Use of Generators • Establishment of proposed Sub-station		x	GNR 327 (Activity 2) GNR 325 (Activity 17) GNR 327 (Activity 11) GNR 325 (Activity 15)

(ii) Description of the activities to be undertaken

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

- ***Description of Mining Method***

Nakedi Solutions intends to mine Iron ore, Manganese, Gemstone and Silica (high grade and medium grade) as the main mineral/ore with various ores which will be found on site and which have been applied for.

The process will start by the vegetation clearance, removal of the topsoil and overburden and the topsoil/overburden will be stockpiled for the purpose of rehabilitation once mining ceases. The quarrying process is conducted by means of drilling, blasting, diesel-electric haul trucks, hydraulic and possible electric rope shovels and other associated mining equipment.

This mine is going to be an open pit mine with the main activity of mining being drill and blast method. Creating initial free faces by making a box cut,

- Drilling and blasting of overburden,
- Loading and hauling of overburden to waste dumps or backfilling after Iron ore, Manganese, Gemstone and Silica extraction,
- Drilling and blasting of waste rock,
- Loading and hauling of waste rock to waste dumps or backfilling after Iron ore, Manganese, Gemstone and Silica extraction.
- Drilling and blasting of Iron ore, Manganese, Gemstone and Silica lodes,
- Loading and hauling of the Iron ore, Manganese, Gemstone and Silica to primary crusher/ ROM stockpile.

After the drill and blast Nakedi Solutions will crush with the primary crusher of the Iron ore, Manganese, Gemstone and Silica while the waste rock will be transported to the rock dump (about 200Ha). The crushed material will be transported via conveyor/trucks to a secondary crusher out of the pit.

Nakedi Solutions plans to mine in the applied area. Should there be a desire to mine nearby areas, another Environmental Impact Assessment will be conducted in terms of another Environmental Authorization which must be subjected to public participation as well as specialist studies for that particular area.

The final pit is planned with four push backs. The production benches are 5-12m high based on the mining consideration.

The pushbacks and final pit selection were based on:

- • Incremental pit based on pit shells which sit at inflection points of Figure 23.
- • Maximising life of mine (“LOM”) tonnage

Production will be ramped up over a period of 3 years as the pit space increases and the waste rock mining decreases. Waste dumps (200Ha) will be designed for safety as well as minimum environmental

(a) Explosives

An explosive store shall be established as well as warehousing (stores) for the consumables (i.e. fuel, tyres, ground engaging and explosives) and maintenance spares (i.e. engine parts, filters, and steel for fabrication) needed for all the equipment, all these will be located in the office area/site.

The proposed mine will have a contract for Down-Hole explosives services, and will receive bulk delivery into magazines and silos as, if and when required by trucks. The logistics function for the ordering, receiving and distribution of explosives will be the responsibility of the Down-Hole Service supplier.

(b) Mining Equipment of Site

The site is estimated to have an average of eight (8x) B50 Articulated Dump Trucks (ADTs) , one (x) diesel bowser, one (1x) water bowser, two (2x) Front End Loaders (FEL), two (2x) 70 Ton exactors as well two (2) dozers.

(c) Anticipated Mining Output

These are the anticipated volumes of material for the maximum or the most material that will be moved on this site at a maximum stripping ratio of 1:3. Any increase in the below output will require either additional equipment and/or to have a 24hour production mine (this has been calculated at a maximum of one (1x) 10 hour- shift).

Table 0-1: anticipated ROM and waste outputs

	ROM Output		Waste - Output	
	Monthly	**Yearly**	**Monthly**	**Yearly**
Tonnes (t)	30 000	360 000	90 000	1 080 000
Cubic Meters (m^3)	8 956	107 472	26 868	322 416

(d) Mine and plant residue

There will be a waste rock dump during operational phase adjacent to the open pit. Free dumping from the surface or ground will take place. A final slope angle of 32.5° is assumed with a bulking factor of 1.3 for broken waste rock. The proposed design caters for 23 588 060 m³ of waste rock.. The overburden and rock dump (200Ha) and discard dump will be located a few meters south of the pit area on the applied mining area.

(e) Commodities to be mined:

- Manganese, Iron Ore, Gemstone and Silica respectively.

(f) Ore processing activities

The proposed mine will produce a combination of high grade ROM ore, direct shipping ore ("DSO"), which will not require beneficiation, as well as DMS ore which will benefit from beneficiation. The crushing and screening facilities will be designed to process both ore types and deliver these onto two separate -32 mm stockpiles.

The DMS beneficiation plants will process up to 400 000tpa of input using a single 610mm DMS cyclone for the +1 mm fraction and spirals for the fines.

The DMS product and DSO will be combined in the product handling area, before classifying the product into a lumpy (-32mm +6.3mm) and fines (-6.3mm) fraction. The ultra-fine product will be combined with the fine product before stacking on a conical stockpile, with the lumpy product being stacked on a separate conical stockpile; the ore stockpile will be approximately 15Ha

Waste from the two beneficiation areas will be combined before disposal. Water recovery will be done by means of a thickener, with the thickener underflow being dewatered by a belt press filter before disposal on the waste dump.

- ***Primary and Secondary Crushing***

A ROM bin will be required into which the ore will be tipped by front end loader ("FEL") or haul trucks. The capacity of the bin should be at least three haul truck loads. An apron feeder will be located below the bin and will feed the ore directly into the jaw crusher. The jaw crusher has been sized to handle a top size of 1000mm. A mobile hydraulic hammer unit will be required to break oversize material causing blockages to the jaw crusher. The jaw crusher will operate with a closed side setting of 175mm. From the jaw crusher, the crushed ore will be fed onto a scalping screen which will remove undersize material prior to the oversize reporting to a secondary cone crusher. The screen oversize will feed into a bin from which the feed to the secondary crusher will be controlled. The secondary crusher will operate at a closed side setting of 40mm. The screen undersize and crusher product will then be stockpiled using a radial stacker.

- ***Tertiary Crushing and Stockpiling***

From the stockpile, ore will be recovered using FELs. The ore will be fed onto a scalping screen to remove undersize material prior to tertiary crushing. The screen oversize will feed into a bin from which the feed to the tertiary crusher will be controlled. The crusher product will be recycled back to the scalping screen. The screen undersize will be 32mm. A flopper gate system will be installed on the screen undersize. The flopper gate will be used to direct the ore to a direct shipping ore stockpile or a beneficiation feed stockpile using radial stackers.

- ***Beneficiation plant***

DMS Beneficiation

Fresh feed will first be deslimed using a prewash screen with spray water to remove any fines. As the ore has been sprayed, it will retain water when it leaves the screen. The amount of water is typically 7-10% of the volume of the solids, depending upon the particle size range and screen operation. This material will then be mixed with a circulating medium of the required density in a mixing box. The combined ore plus the medium will then be pump fed to the dense medium cyclone. Within the cyclone, the ore splits into a light fraction (floats) and a heavy fraction (sinks). The split is determined by the densimetric properties of the ore and the circulating medium density.

The floats and sinks fractions will then be passed through a medium recovery circuit. The sinks fraction first passes over a static screen. The majority of the medium will pass through the screen and the ore with the remaining medium will pass over the static screen onto the drain and rinse screen.

The drain and rinse screen is a vibrating screen which is divided into two sections, being the drain section (normally 1/3 of the screen length) and the rinse section (the remaining 2/3 of the screen length). In the drain section, most of the remaining medium, which was not recovered over the static screen, is recovered to the screen undersize. The screen undersize from the drain section and the undersize from the static screen are fed to the correct medium ("CM") sump.

In the rinse section of the screen, water is used to wash off any medium which still adheres to the ore particles. The diluted stream containing medium and spray water is then fed to the dilute medium ("DM") sump. The floats fraction undergoes exactly the same process to recover the medium. From magnetic fraction will be recovered and fed back to the correct medium sump. The effluent from the magnetic separator consists primarily of water, non-magnetic particles and some magnetic medium. A portion will be re-used as spray water on the rinse screens and the balance will be sent to thickener. The density of the correct medium is measured and control water is added to maintain the correct medium at the required set point.

- ***Spirals beneficiation***

The pre-wash screen undersize will be minus 1mm and in the absence of magnetic properties, gravity separation will be used to beneficiate this size fraction. The screen undersize will be fed to a desliming cyclone. The function of the de-sliming cyclone is twofold. Firstly, ultrafine material (minus 30 micron) will be removed to the overflow as this fraction does not beneficiate on spirals and if present could adversely affect both the yield and quality of beneficiated material from the spiral circuit.

Secondly, the de-sliming cyclone dewaters the screen undersize enabling the rougher spiral to be fed at a controlled slurry density. The cyclone overflow is sent to the thickener.

The rougher spiral produces two streams, a concentrate and a tails. The concentrate stream will not be at the final product quality, and the tails will still contain some recoverable haematite. The rougher concentrate stream will be fed to a cleaner spiral. The cleaner concentrate stream will be of the

required quality for final product. The cleaner tails will be dewatered using a dewatering screen to produce a conveyable product. The cleaner tails will be recycled to the scavenger circuit to recover any haematite that may still be present. The rougher tails is combined with the cleaner tails and fed to a dewatering cyclone. The function of the cyclone is to remove water so that the scavenger spirals can be fed at the required density. The cyclone overflow will be sent to the thickener. The scavenger spiral concentrate will be recycled back to the cleaner spiral and the scavenger spiral tails will be fed to a dewatering screen to produce a conveyable waste stream.

- ***Product Handling***

The DSO will be combined with the product of the dense medium circuit and then screened at 6mm into a lumpy (-32mm +6mm) and fines (-6mm) fraction. The lumpy fraction will be stockpiled using a radial stacker. The concentrate from the spiral circuit will be combined with the fines fraction and stockpiled using a radial stacker.

- ***Water recovery***

The magnetic separator effluent and cyclone overflow from the spiral circuit will be fed to the thickener. With the aid of flocculent, a high density underflow will be produced and clear water will be recycled to the process water tank for re-use in the plant.

- ***Slimes Disposal***

Typically a filter press will be used to settle out the fine material and recover additional water for use in the plant. A filter press is an alternative which eliminates the need for a slimes dam. For the capital estimate it has been assumed that a belt press filter will be used to dewater the slimes.

- ***Spiral plant waste***

The dense medium and spiral plant waste will be combined for disposal on the discard dump.

- ***Product and run of mine***

The ROM will be stockpiled on a ROM stockpile in close proximity to the ROM Primary crusher to be used for blending purposes and to eliminate production fluctuations.
The Product Stockpile will be located at the plant and will consist of a Lump stockpile and a Fines stockpile.

(g) Auxiliary Services

Sewerage Waste

It is estimated that a staff compliment of between 50-150 will be required for the project. Sewerage is expected to be generated at 88 litres per person per day, resulting in a total of between 4 400L (for 50people) to 13 200 (for 150 people) litres per day. Two separate systems shall be constructed. One serving the administration offices, workshops and stores that is expected to account for 50% of the sewerage generated, and the second serving the production area, accounting for the remaining

50%. Peak flow generated for each of these areas will be approximately 1.4l/s. It is proposed that the sewer be gravity fed to two central treatment plants where it will be processed, generating minimal outfall. For maintenance purposes, 160mm diameter uPVC pipes, laid underground at a minimum slope of 1:80, are to be utilised. From the preliminary layout, a total pipe length of approximately 2,865m is expected. Two Lilliput SBC 48000 FK BT CL sewerage effluent treatment plants, equipped with pre-digestion, balancing, bio-reactor and clarifier and disinfection stages are proposed. The sewage from the septic tanks (pre-digestion) shall be pumped at a constant rate to the Lilliput Bio-Reactor. The effluent shall enter the bio-reactor below the AWW Mark Two fixed-growth media where it mixes with an air diffuser. The effluent shall rise through the media where the microbial population attached to the media shall remove and aerobically degrades the organic material contained in the aerated effluent.

(h) Mechanical Servicing of mine plant

The equipment on site needs to be regularly inspected and checked of any oil leaks as well as the oil changed regularly as per the manufactures manual so as to reduce the over emission of fumes which will cause air pollution. This is done in-line with the environmental consideration.

- ***Roads***

i) Access Road

Widening of the current gravel road is proposed in the long run, which will be constructed from the existing gravel road that turns into the farm entrance from the main gravel road that connects from the R561 road through the farm Langebaan which is a private farm of which the access must be obtain first; the current proposal is a 12m wide road which is 2.5km long along the eastern edge of the farm as an access route with storm water earth channels and mitre drains to protect the road structure from flood damage. A detailed structural pavement design, taking into account current and future traffic loading, will be completed during the prefeasibility phase and possible geotechnical studies done for this road which may be surfaced by Tar. Bronkhor currently has over 17km of gravel roads that already exist while Baden has just over 14km of gravel road making it a combined of over 31Km of road network that is existing. Given the latest proposal, a 14km road for the access as well as as the mine is proposed.

Intersections will be properly designed to provide safe entry and exit into the mining complex. The access road that turns to the mine will be extended to reduce the congestion of traffic on the current gravel road though it is not that busy. While the access roads will have a 2-lane road both for incoming and outgoing section into the mine. The gate will have a total of 4 lanes. The first lane will be for visitors (which will also be used by employees when there is a congestion on the employees side). The second/middle lane will be used by employees and sub-contractors on site who have access cards and will be used by mine trucks and plant

ii) Internal Mining Complex Roads

The internal roads will be 6m wide surfaced tar roads with semi mountable kerbs and non-mountable kerbs on both sides of the road as required. A detailed structural pavement design, taking into account current and future traffic loading, will be completed during the detail design phase.

These roads will be equipped with all the required stormwater systems and structures to prevent any possible flooding. Bronkhor currently has over 17km of gravel roads that already exist while Baden has just over 14km of gravel road making it a combined of over 31Km of road network that is existing. Given the latest proposal, a 14km road for the access as well as as the mine is proposed.

Roads will be created and graded regularly, some areas will either be tarred or pavement installed, especially the area from the gate to the office and parking area for the cars. The areas which are common for trucks to travel on will be regularly graded and sprayed with water to reduce dust. This will be done or considered during the maximum production and not in the initial stage

iii) Haul Roads

Dedicated haul roads for the rigid dump trucks will be 16 m wide with safety berms on either side. The road pavement structure and geometric design will be based on the largest vehicle to be used in operations. Dust from these roads will be controlled by applying road binders and regular watering with water tankers.

Storm water drainage and culverts are designed to protect the road structure itself, and to divert the water to natural water courses where possible.

iv) Pit bound Light Delivery Vehicle Roads

- ❖ A 6m wide gravel dedicated mine vehicle roadway on the side with a safety berm between the mine vehicle roadway and the haul road will be constructed.
- ❖ Dust from these roads will be controlled by applying road binders and regular watering with water tankers.
- ❖ Storm water drainage and culverts are designed to protect the road structure itself, and to divert the water to natural water courses where possible.

- ***Water Supply***

Nakedi Solutions' Mine is anticipated to require a volume of approximately 4 400L-13 200L/day (the exact quantities will be revised and incorporated based on the findings of the WULA) to ensure an effective and efficient mining operation. This portion of the report proposes a best practice approach to acquire all information necessary to complete a hydrogeological investigation that investigates the sustainability of water resource in the local aquifers; whose investigations are yet to be conducted.

i) Industrial Water Requirements:

Bulk water supply has the potential to be one of the biggest non-commercial influences on the viability of the Project. No bulk water supply currently exists in the vicinity of the site. Investigations will be conducted to quantify and qualify the exact amounts of water available as well as predict the difference so as to identify and propose the most suitable source of water to address the shortfalls

and ensure sustainability of water resources.. Initially (at the beginning of the mining operations), Nakedi Solutions will t source water from the current and pre-existing pits on site (the water will then be pumped then collect the water into various collection ponds and recycle the very same water for the environmental consideration). As it stands, there is only one known borehole on the applied area and depending on the availability of underground water; additional boreholes will be drilled to increase the water capacity. Provided there are positive findings and recommendations of the WULA process, ground water may be extracted from additional boreholes established in the area, as this method of water supply seems to be the most viable for the Project as things stand.

The groundwater specialist studies that will be conducted will determine if the current water as well as borehole on site are sufficient for the operation or not. The use of any natural or groundwater will be subject to the WULA process as per Section 21 of the NWA that will be lodged with DWS issuing permission.

ii) Surface Run-Off Water:

Run-off water from disturbed areas will be collected and stored in holding ponds located near the pits. The water will be routed to the holding area, utilising a series of diversion berms. Collected water will be used for the mining and treatment processes after treatment.

All water generated by the mining activities will be stored in a High-Density Polyethylene (HDPE) - lined Pollution Control Dam (PCD) and re-used in the beneficiation plant as well as for dust-control purposes on the haul roads.

- ***Mine Closure:***

It is predicted that the pit will start decanting post closure. Monitoring will be implemented post closure according to DWA WULA and NEMA closure recommendations. The closure of the mine must bring some form of relief to both the project owners and the workers, the pit which has been created need to be planned and carefully thought of after the mine. The are some proposals on the table such as an open pit theme park and/or restaurant, creating a water reservoir for the near by farmers or backfilling the whole pit with the dump rock which is inside. However, backfilling the area has a more environmental benefit as compared to the theme park but it does not create employment for the employees in numbers.

Figure 5: Typical old Open pit being used as a restaurant

Figure 6: An example of an old copper mine pit turned into a music conference venue

- ***Surface Infrastructure***

i) Brake Test Ramp

A brake test ramp has been included to test the braking capabilities of vehicles into the pit. The gradient of the brake test ramp will be similar to the maximum gradient experienced at the opencast pit. There will be a dedicated parking area for the rigid dump trucks with safety berms and the vehicles will be approached from the rear in the parking area. The brake test ramp is located at the exit of the parking area to ensure the brakes are functional immediately after start up.

ii) Storm and Polluted Water Management:

Storm water cut – off drains and deflection berms will be designed and constructed on site, according to site topographic conditions. The principal of separation of clean and dirty water systems will be adhered to, and where possible and practical, storm water runoff will be routed around the site, and away from potential contamination areas. Clean water drains and berms will be redirected towards the natural watercourses in the area. Clean water drains are earth lined (velocities permitting).

Areas such as workshops, fuel storage bays, conveyor routes, discard dumps, wash down areas, stockpiles and the tip areas are regarded as contaminated/polluted. These areas will have a network of concrete lined drains and pipe culverts that will gravitate towards a PCD. All inflows will be routed through a silt trap and oil separation system to ensure dam capacity is not compromised through sediment deposition.

The PCD (dirty water dam) will be HDPE lined and sized to accommodate a 1:100 year storm period with an 800mm freeboard. The full design capacity of the dam will be maintained at all times, with zero allowance for environmental flows at or below the design storm intensity. Water contained within the dam subsequent to a rainfall event will be used to augment mine water. And emphasis will be placed on maximum recovery and reuse of all water (where practical and permissible).

iii) Security Fencing – Perimeter

2.4 meters high galvanized high security fencing will be used as perimeter fencing. One point of access will be provided, this makes access control easier.

iv) Bus Terminal

Bus shelter and sufficient turning areas with separate disembarking and embarking areas provided at the terminal.

v) Parking Area

Sufficient Parking for visitors, office personnel and mine vehicles. Covered parking will be available for office personnel. The parking layout is structured to allow for future expansion requirements and such layout is not finalized yet, especially given the fact that it does not require any authorization.

vi) Conveyors

Given the size of the operation, conveyor belts have not been considered yet but should they fit the operations they will be totally enclosed with security fencing. Armco or similar safety barriers will separate the service road from conveyors, where required.

- ***Buildings***

i) Change House

The change house will accommodate a total of 150 people and this is because of the possibility of having a 24/7 hour operation a three (3) shift rotation system in the long run or at some point. The philosophy used is one of clean and dirty flow separation. However as it stands, a 10 hour shift is proposed currently.

The change house split caters for both male and female as well as for officials and skilled labour. Lockers design caters for a split between personal clothing and Personal Protective Equipment (PPE).

ii) Workshop

A workshop with dedicated areas for the various machineries including mine vehicles will be constructed at the mining complex area. This will be an open-sided, steel portal building.

iii) Store

A storage building will be dedicated to stores and parts for the machinery on site including various spares, PPE and equipment to be used on site. It will have a dedicated workers who keep an inventory of what has been purchased, dispatched and still kept on the store..

iv) Offices

The offices will comprise of brick and mortar building which will be used in the long run, however during the beginning of the project, prefab offices maybe used. There is an old house in the southern side of the previously mined out pits which may be renovated to be an office with some extension of the building which may be required. . This building shall include the control room, green rooms, boardrooms, offices, kitchen and a small change house for visitors and senior management, ablution facilities for male and female as well as disabled facilities.

v) Gate House

The Gate house will consist of a main security room with a reception hatch, ablution facilities and turnstiles.

vi) Diesel and Wash bays

A diesel and wash bay is provided for re-fuelling and washing of vehicles and equipment and such diesel and hydrocarbon must be well kept or stored.

vii) Substations and electrification

A bulk power supply will be needed to deliver via two dedicated Overhead Power lines to the site Sub-Station which will need to be constructed. Based on the position of the resources, there is some form of Eskom infrastructure in the immediate vicinity to the site. A high-level review was undertaken to establish where there is current infrastructure. It was found that Baltimore and Tolwe would be the nearest town to draw electricity from.

Eskom's Limpopo division will be engaged to establish various scenarios for the power supply to the site. There is an option to connect into the existing national grid at 132 kilovolts (kV) or 88 kV high voltage level at the existing Eskom substations. The power would be conveyed to the sites by single overhead lines. A diesel generator will be used on the mean time

The reticulation concept for the site would comprise the following:

- A continuous connected supply from the national grid, generated, and controlled by
- Eskom at a 'Notified Maximum Demand' level; and
- 'Onsite automated standby 'power supply generators that would be sufficient to maintain operation of critical machines, emergency plant operations, and essential lighting and security requirements of the mine site.

Figure 7: Existing Eskom power-lines on site

- **Policy and Legislative Context**

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	RELEVANCE OR REFERENCE
Mineral and Petroleum Resources Development Act, 2002 (MPRDA, No. 28 of 2002).	THROUGH OUT THIS DOCUMET
National Environmental Management Act, 1998 (NEMA, No. 107 of 1998).	
Environmental Impact Assessment regulations (Government Notice Regulation (GNR) 326, 327, 325 and 985, published 4 December 2014) (EIA Regulations in terms of NEMA.	
DEA (2010), Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9, Department of Environmental Affairs.	
DEA (2010), Public Participation 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs.	
SANBI Grasslands Programme's Mining and Biodiversity Guideline (2012)	
National Environmental Management: Biodiversity Act, 2004 (NEM:BA No 10 of 2004)	
Conservation of Agricultural Resources Act, 1327 (CARA, No. 43 of 1327);	
National Veld and Forest Fire Act No. 101 of 1998	
SANBI Wetland Inventory (2006)	
International Union for Conservation of Nature (IUCN)	
National Protected Areas Expansion Strategy 2008 (NPAES)	
South African National Botanical Institute (SANBI) Integrated Biodiversity Information	
National Heritage Resources Act, 1999 (NHRA, No 25 of 1999);	
Local Municipality Environmental Laws	
Blouberg Local Municipality , Land Use Management By-law published in terms of section 13(a) of the Local Government Municipal Systems Act, 2000 (Act 32 of 2000).	
The Environmental Impact Assessment Regulation GNR. 326 dated 04 December 2014.	
The Environmental Impact Assessment Regulation. Listing Notice 1. GNR. 327 dated 04 December 2014.	
The Environmental Impact Assessment Regulation. Listing Notice 2. GNR. 325 dated 04 December 2014.	
Guideline on Need and Desirability in terms of the Environmental Impact Assessment (EIA) Regulations, 2010. Government Notice 891 of 2014.	
Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector	
Limpopo Environmental Management Act, 2003 (Act No.7 of 2009).	
The National Environmental Management: Air Quality Act (Act No 39 of 2004).	
SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments	
DMRE Guideline for Consultation with communities and Interested and Affected Parties. As required in terms of Sections 16(4)(b) or 27(5)(b) of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources	
Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.	
Blouberg, Capricorn IDP	

i. The South African Constitution: Act 108 of 1996

This section provides an overview of the legislative requirements applicable to this project and it includes the Acts, guidelines and policies considered in the compilation of this report. The legislative motivation for this project is underpinned by the Constitution of South Africa, 1996 (Act No. 108 of 1996), which states that:

The State must, in compliance with Section 7(2) of the Constitution, respect, protect, promote and fulfil the rights enshrined in the Bill of Rights, which is the cornerstone of democracy in South Africa. Section 24 of the Constitution:

24. Environment

-Everyone has the right-

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

Section 24 of the Constitution of South Africa (Act No. 108 of 1996) requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs or the relevant provincial Ministers to identify:

- new activities that require approval;
- areas within which activities require approval; and
- existing activities that should be assessed and reported on.

Section 28(1) of the Constitution of South Africa (Act No. 108 of 1996) states that: *"every person who has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".* If such pollution or degradation cannot be prevented then appropriate measures must be taken to minimise or rectify such pollution or degradation. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution or degradation; and
- Remedying the effects of the pollution or degradation.

Applicability: Public participation process and consultation at every stage of both the Scoping and EIA phase. A public participation process was followed and consultations was done regarding the proposed project. Both the Scoping and EIA was shared and circulated during these phases.

ii. National Environmental Management Act: Act 107 of 1998

The NEMA Act under sections 24(2), 24(5), 24D and 44, read with section 47A (1) (b) of National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2014, is regarded as one of the important pieces of general environmental legislation as it provides a framework for environmental law reform. The main objective of this act is to ensure that ecosystem services and biodiversity are protected and maintained for sustainable development. Furthermore,

Section 28 (1) of the NEMA requires that "every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".

NEMA strives to regulate national environmental management policy and is focussed primarily on cooperative governance, public participation and sustainable development. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will promote co-operative governance and procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith.

A scoping report addressing the requirements of GNR 326 of the NEMA was compiled and submitted to the DMRE in July 2021. The Scoping Report contained information necessary for the understanding of the process, including all preferred alternatives location alternatives, the scope of the assessment. A description of the consultation process undertaken during the

Scoping phase and to be undertaken through the environmental impact assessment process was also included. The DMRE accepted the Scoping Report and Plan of study contained therein and requested that the applicant commence with the EIA phase of the assessment, including the detailed specialist studies.

(i) details of-
    I. the EAP who prepared the report; and
    II. the expertise of the EAP, including a curriculum vitae;

(ii) the location of the activity, including-
    I. the 21 digit Surveyor General code of each cadastral land parcel;
    II. where available, the physical address and farm name;
    III. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;

(iii) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-

I. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or

II. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;

(iv) a description of the scope of the proposed activity, including-

I. all listed and specified activities triggered;

II. a description of the activities to be undertaken, including associated structures and infrastructure;

(v) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;

(vi) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

(vii) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including-

I. details of all the alternatives considered;

II. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;

III. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;

IV. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

V. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts;-

(a) can be reversed;

(b) may cause irreplaceable loss of resources; and

(c) can be avoided, managed or mitigated;

VI. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;

VII. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;

VIII. the possible mitigation measures that could be applied and level of residual risk;
IX. the outcome of the site selection matrix;
X. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and
XI. a concluding statement indicating the preferred alternatives, including preferred location of the activity;

Applicability: Baseline environmental information of the project area has been assessed in form of specialist reports. Mitigation measures and recommendations where provided according to best practice standards. This scoping and EIA/EMP report complies with the requirements of the NEMA act.

iii. Mineral and Petroleum Resources Development Act: Act 28 of 2002

The MPRDA makes provision, for persons to apply for a mining right. A mining right granted in terms of the MPRDA is a limited real right in respect of the type of resources and the land to which the right relates. The holder of a mining right is entitled to the rights referred to in the MPRDA or any other law.

The applicant requires a mining right and environmental authorisation from the DMRE. Acceptance of the application by DMRE only permits the applicant to continue with the necessary process and does not constitute authorisation. The acceptance details the outstanding requirements for the application, which includes:

(a) the submission of an EMP; and
(b) notification and consultation with IAPs, including land owners or lawful occupiers of land, on which the proposed mining is to be conducted;
(c) Details on how the applicant will substantially and meaningfully expand opportunities for historically disadvantaged persons**.**

Applicability: A mining right was lodged with the DMRE and is still pending the outcome as various reports have been submitted.

iv. National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)

The overarching aim of the National Environmental Management: Biodiversity Act, 2004 (NEMBA), within the framework of NEMA, is to provide for:

- The management and conservation of biological diversity within South Africa as well as for the components of such biological diversity;
- The use of indigenous biological resources in a sustainable manner and
- The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting
- Involving indigenous biological resources.

As part of its implementation strategy of NEMBA, the National Spatial Biodiversity Assessment was developed. This assessment classifies areas as worthy of protection based on its biophysical

characteristics, which are ranked according to priority levels. The approach used for biodiversity planning is systematic and entails the following three key principles:

- The need to conserve a representative sample of biodiversity pattern, such as species and habitats (the principle of representation);
- The need to conserve the ecological and evolutionary processes that allow biodiversity to persist over time (the principle of persistence); and
- The need to set quantitative biodiversity targets that quantifies the degree of conservation required for each biodiversity feature in order to maintain functioning landscapes and seascapes.

Furthermore, the South African National Biodiversity Institute (SANBI) was established by the NEMBA, its purpose being (*inter alia*) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems. NEMBA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a "restricted activity" involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 8 of the Act. Lists of critically endangered, endangered, vulnerable and protected species have been published and a permit system for listed species has been established.
It is also appropriate to undertake an Ecological (Fauna and Flora) Impact Assessment for developments in an area that is considered ecologically sensitive and which requires environmental authorisation in terms of NEMA, with such assessment taking place during the Scoping or EIA phase. The Applicant is therefore required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required.

v. National Forest Act: 1998 (Act 84 of 1998)

The purposes of National Forest Act, 1998 (act 84 of 1998) (NFA) includes *inter alia:*

(a) provide special measures for the protection of certain forests and trees:

(b) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

Applicability: An Ecological study has been done (refer to Annexure: Specialist Reports-) to determine the tree species in the project area and specify if there are any endangered species.

vi. National Environmental Management: Air Quality Act (Act No 39 of 2004)

Section 28 (1) of NEMA places a general duty of care on any person who causes pollution, to take reasonable measures to prevent such pollution from occurring. The objective of the National Environmental Management: Air Quality Act, 2004 (NEM:AQA) is to regulate air quality in order to protect, restore and enhance the quality of air in the Republic, taking into account the need for sustainable development. Furthermore, the provision of national norms and standards regulating air

quality monitoring, management and the control by all spheres of government determine that specific air quality measures should be adhered to. Dust created during the construction and operational phases of the proposed Nakedi Solutions Lime Mine could influence air quality and thus make this legislation relevant to this development. Air quality management and mitigation measures during the mining phase will be considered to be a measure to exercise this duty of care, since it aim to minimise volumes of dust emissions emanating from the operational activities.

An air emission license will not be required for the application process but air quality monitoring will be implemented.

Applicability: All phases of the project will result in dust production which will have an impact on ambient air quality. Refer to Annexure 11-A for the Baseline Air Quality Assessment.

vii. Conservation of Agricultural Resources: Act (Act 43 of 1327)

The aim of the Conservation of Agricultural Resources Act,1327 (Act 43 of 1327) (CARA) is to provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants and for matters connected therewith. The EIA phase of the project will take into account the requirements of CARA as well as determine the potential direct and indirect impacts on agricultural resources as a result of the proposed mining development.

Applicability: The project area is mainly used for Game Farming and the project has potential to impact on soils and land use in the area.

viii. National Environmental Management: Waste Act (Act 59 of 2008)

The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) and Waste Classification and Management Regulations, 2003 (GNR: 634 – 635): To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

The operational activities associated with the proposed mining program shall be in accordance with the requirements of National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) and Waste Classification and Management Regulations, 2003 (GNR: 634 – 635). Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine will manages its waste in a legally compliant manner, tailings – will be returned to the pit as backfill and is excluded from NEM:WA).

ix. Occupational Health and Safety Act: Act (Act 85 of 1993)

The aim of the Occupational Health and Safety Act, 1993 (act 85 of 1993) (OHSA) is to provide for the health and safety of persons at work and for the health and safety of persons in connection with 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 in connection with the activities of persons at work; to establish an advisory council for occupational health and safety as well as to provide for matters connected therewith.

Section 8 which deals with the general duties of employers and their employees states that:

1. *"Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of the employees."*
2. *''Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular:*

(a) *The provision and maintenance of systems of work, plant and machinery that, as far as reasonably practicable, are safe and without risk to health;*

(b) *Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety and health of employees;*

(c) *Making arrangement for ensuring as far as reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage and transport of articles or substances;*

(d) *Establishing, as far as reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as reasonably practicable, further establish what precautionary measures should be taken with respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;*

(e) *Providing such information, instruction, training and supervision as may be necessary to ensure, as far as reasonably practicable, the health and safety of employees;*

(f) *As far as reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store, or transport any article or substance or to operate any plant or machinery, unless precautionary measures contemplated in paragraph (b) and (d), or any precautionary measures which may be prescribed, have been taken;*

(g) *Taking all necessary measures to ensure that the requirements of this act are complied with by every person in his employment or on the premises under his control where plant and machinery is used;*

(h) *Enforcing such measures as may be necessary in the interest of health and safety;*

(i) *Ensuring that work is performed and that plant and machinery is used under the general supervision of a person trained to understand the hazards associated with it and who has*

the authority to ensure that precautionary measures taken by the employer are implemented and

(j) Causing any employees to be informed regarding the scope of their authority as contemplated in section 37(1)(b)."

x. National Heritage Resource Act, 1999 (Act No. 25 of 1999)

The proposed Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine project must comply with the requirements stipulated in the National Heritage Resources Act, 1999 (Act 25 of 1998) (NHRA). The NHRA legislates the necessity for cultural and Heritage Impact Assessment (HIA) in areas earmarked for development, which exceed 0.5 ha or linear development exceeding 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Section 38(1) of LPHRA, subject to the provisions of subsections (7), (8) and (9), requires that any person who intends to undertake a development categorised as:

*(a) The construction of **a road**, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*

(b) The construction of a bridge or similar structure exceeding 50m in length;

(c) *Any development or other activity which will change the character of a site*

(i) Exceeding 5 000 m2 in extent; or

(ii) Involving three or more existing or subdivisions thereof; or

(iii) Involving three or more or divisions thereof which have been consolidated within the past five years; or

(iv) The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) The re-zoning of a site exceeding 10 000 m2 in extent; or

(e) Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Archaeological impact assessments (AIAs) are often commissioned as part of the heritage component of an EIA and are required under Section 38(1) of the NHRA of 1999, Section 38(8) of the NEMA and the MPRDA.

The process of archaeological assessment usually takes the form of:

1. A scoping or initial pre-assessment phase where the archaeologist and developer's representative establish the scope of the project and terms of reference for the project;
2. A Phase 1 AIA;
3. A Phase 2 archaeological mitigation proposal; and

4. A Phase 3 heritage site management plan.

Phase 1: Archaeological Impact Assessment (refer to Annexure 11-E for the Heritage Impact Assessment).

A Phase 1 AIA generally involves the identification and assessment of sites during a field survey of a portion of land that is going to be affected by a potentially destructive or landscape altering activity. The locations of the sites are recorded and the sites are described and characterised. The archaeologist assesses the significance of the sites and the potential impact of the development on the sites and makes recommendations. It is essential that the report supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved.

Minimum standards for reports, site documentation and descriptions are clearly set out by the SAHRA and supported by the Association of Southern African Professional Archaeologists (ASAPA). The sustainable conservation of archaeological material (*in situ*) is always the best option for any sites that are deemed to be of importance. The report needs to indicate which sites these are, explain why they are significant and recommend management measures. In certain kinds of developments which involve massive intervention (mining, dam construction, etc.), it is not possible to reach a conservation solution other than to develop a programme of mitigation which is likely to involve the total or partial “rescue” of archaeological material and its indefinite storage in a place of safety.

Applicability: A Phase One Heritage study has been conducted and it is recommended that the project can go ahead as there were no sensitive areas found on site during the field work. Should such be found, all work must stop and the local police or the specialist called on site for investigation.

xi. National Water Act, 1998 (Act No.36 of 1998)

The National Water Act, 1998 (Act 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level.

The purpose of the NWA is to ensure that the nation’s water resources are protected, used, developed, conserved, managed and controlled in ways, which take into account:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;

- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations and
- Managing floods and droughts.

Applicability: Due to the nature of the activities a water use license will be required and the IWULA process is underway, a pre-application meeting and a site visit has been conducted by specialists and the granting of such is eminent from the DWS is eminent.

xii. Other Applicable National legislations

- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- Roads Ordinance Amendment Act, 1998 (Act No. 17 of 1998);
- South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998);
- The Limpopo Environmental Management Act (No. 7 of 2003);
- The Blouberg Local Municipality Integrated Development Plan;

Applicable Legislation and Approvals Required

The proposed Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica mining project requires the following main approvals before the project may commence:

- Mining Right and Environmental authorization from the Department of Mineral Resources in terms of the MPRDA (Act 28 of 2002) and National Environmental Management Act (Act 107 of 1998) and associated Environmental Impact Assessment Regulations, 2014.
- Approval of an Environmental Management Programme, in terms of the MPRDA DMRE.

In addition to the main legal approvals, the following approvals will be required:

- The South African Heritage Resources Agency needs to approve a heritage assessment, to be conducted as part of the overall EIA process, in terms of the **National Heritage Resources Act** (No 25 of 1999). Permits will be required for the destruction or removal of any heritage resources affected by the development.
- Prior to construction, a tree removal permit will have to be obtained prior to removal, relocation or destruction of indigenous and protected species. This is in terms of the **National Environmental Management: Biodiversity Act** (No 10 of 2004).

- **Need and desirability of the proposed activities.**

  (Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

The South African economy is experiencing a boost and boom especially in the mining and manufacturing sector. The more the country grows and expands, the more jobs are created. South Africa has a vast number of big projects that are in the pipeline, this range from mining to commercial, recreational and residential. The development of a mine which will also produce a number of industrial and household products will be helpful with the increase in the economy in the market as there is increased demand for steel among others. Higher Iron ore, Manganese, Gemstone and Silica grades are needed in improving auto markets, construction and other demanding types of specialised infrastructure. The global pandemic of Covid-19 has worsened the unemployment rate and by opening and operating the mine in the rural area of this area will create employment and community upliftment.

The Blouberg municipal area, as a predominantly rural municipality, encounters economic challenges such as high unemployment levels, high illiteracy levels, skills mismatch, and insufficient infrastructure to support job creation initiatives (Blouberg Local Municipality, 2021). With that being said, Nakedi Solutions is looking at various products such. The project site has been selected on the basis of the presence of economically mineable resources.

The proposed project plan and site layout has been based on limiting the project footprint and trying to avoid sensitive areas where possible from an environmental and social perspective, while still considering engineering feasibility and financial factors. Development of the mine supports the national SA economy at a macro level by gearing sales in the local markets by creating income to the country. Direct economic benefits will be derived from wages, taxes and profits. Direct economic benefits for locals will be derived from the procurement of goods and services and the spending power of employees. This is in line with the Blouberg Local Municipality which identifies mining as a strategic objective for economic development and job creation supporting and guiding development.
Mining diversifies and strengthens the local economy by providing a long term advantage to the creation of sustainable economies, communities and jobs. Further to this, through employment, persons at the proposed mine will gain skills in the construction and operation of a mine in keeping with the skills upgrading and development which contributes to the building of the nation.

Nakedi Solutions proposes to optimise resource extraction through applying for a Mining Right. The anticipated market prices in the medium and long-term are considered to be favourable for project development. The project is likely to contribute greatly to the socio-economic status quo in the form of increased income, employment and other benefits that would cascade through the local, regional and national levels.

- **Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.**

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

Nakedi Solutions has got an existing Prospecting right which they have done some work on including a lot of historic work.

i) Details of the development footprint alternatives considered.

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:

(a) **the property on which or location where it is proposed to undertake the activity;**

The activity will be taking on the applied Mining Right area, mainly Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR. These properties are situated at approximately 170 km North-West of Mokopane Town as well as at approximately 15 km north east of Baltimore Town which is along N11, in the Limpopo Province and cover approximately 2 662ha in extent.

(b) **the type of activity to be undertaken;**

In mining, the alternative in terms of mining is usually in terms of mining method. This will be in terms of underground or open-pit. All those factors in terms of mining method are taken into consideration when we usually look at the depth of the ore. In this particular instance, the ore is seating between 0-60m in depth. This means that it can be mined economically using open cast mining as it is a surface deposit. Underground mining will not be feasible as it is costly and it is recommended for ore seating at 90m and deeper.

(c) **the design or layout of the activity;**

Mining will strictly conform to the granted areas; Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR, respectively.

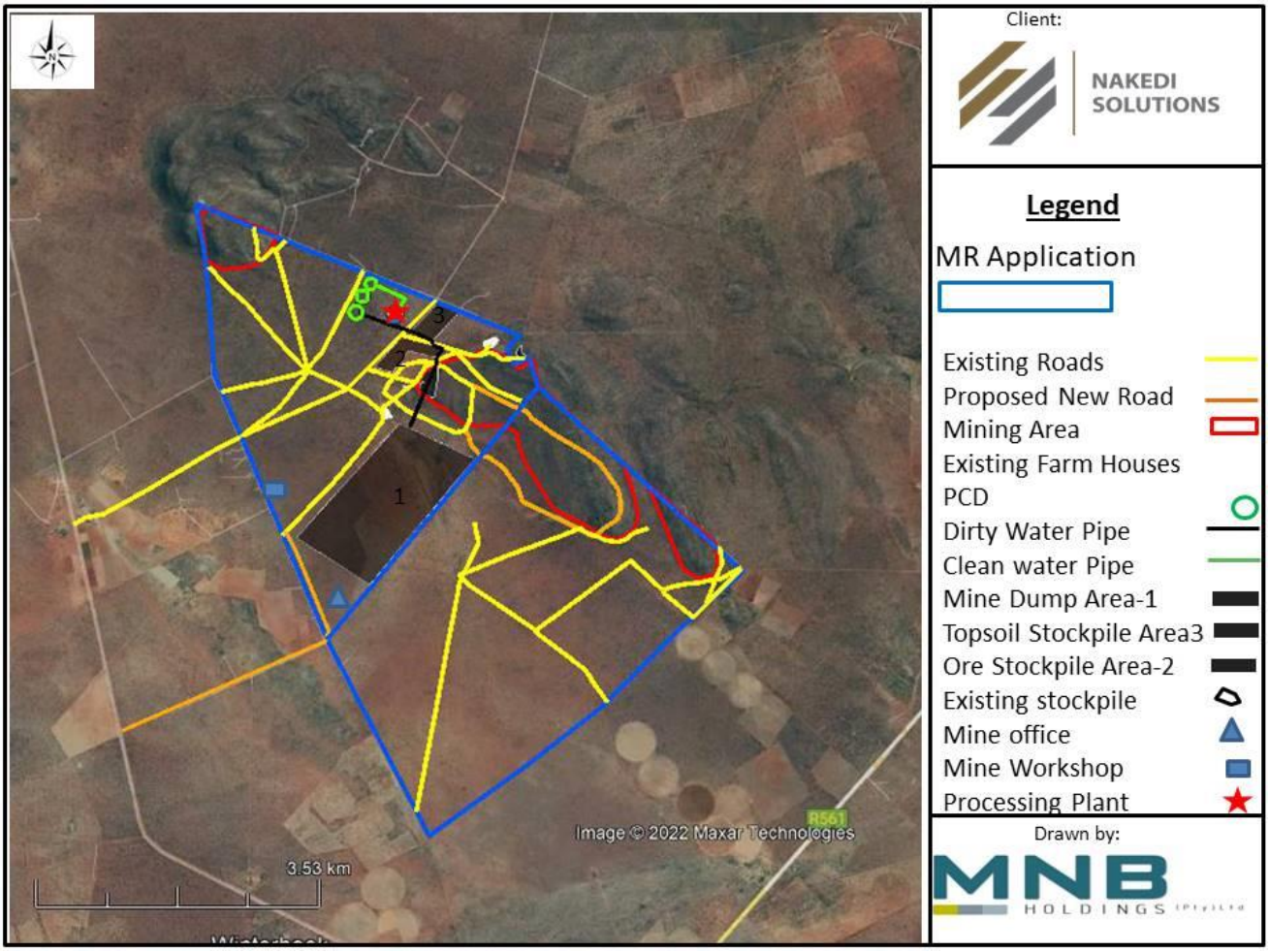


Figure 8: Proposed Nakedi Solutions Mine Activity

(d) **the technology to be used in the activity;**

Mining faces are drilled by means of a blast hole drill rig and drill holes are charged with explosives. The blast is initiated remotely (centralized blasting). The process begins by extracting the ore from the quarry, transport it to the primary crusher, where crushing and screening takes place. Various crushing and screening as well as and washing (where required) takes places. Depending on the product, some of the product is just crushed and screened then sold as it is. The site is estimated to have an average of 8x B50 ADT dump trucks, 1 x diesel bowser, 1 x water bowser, 2 x FEL, 2 x 70 Ton exactors as well 2 dozers. A drill rig for blast holes will also be required from time to time.

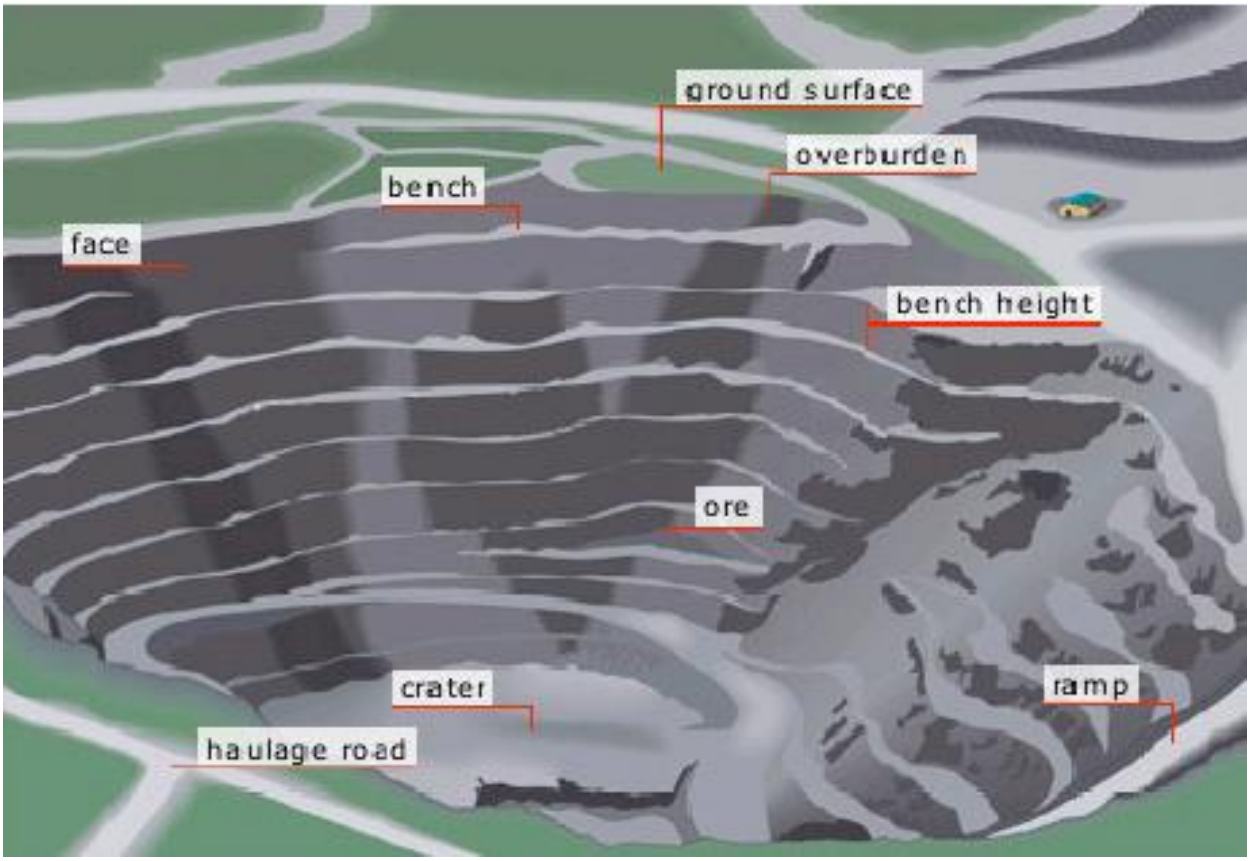


Figure 9: Schematic Open Pit Mine

(e) the operational aspects of the activity; and

Nakedi Solutions intends to mine Iron ore, Manganese, Gemstone and Silica (high grade and medium grade) as the main mineral/ore. The process will start by the vegetation clearance, removal of the topsoil and overburden and the topsoil/overburden will be stockpiled for the purpose of rehabilitation once mining ceases. In some areas as the area was previously mined, there will not be a need for vegetation clearance but only dewatering the pit of water.

Explosives

An explosive store shall be established as well as warehousing (stores) for the consumables (i.e. fuel, tyres, ground engaging and explosives) and maintenance spares (i.e. engine parts, filters, and steel for fabrication) needed for all the equipment, all these will be located in the office area/site.

The proposed mine will have a contract for Down-the-Hole explosives services, and will receive bulk delivery into magazines and silos every second day by trucks with 5t to 30t payloads. The logistics function for the ordering, receiving and distribution of explosives will be the responsibility of the Down the-Hole Service supplier, Nakedi will also look at the option of outsourcing in line with the new Mining Charter and empowerment of near-by communities

Mine and plant residue

There will be a waste rock dump during operational phase adjacent to the open pit. Free dumping from the surface or ground will take place. A final slope angle of 32.5° is assumed with a bulking factor of 1.3 for broken waste rock. The proposed design caters for 23 588 060 million m³ of waste rock. The overburden and rock dump (200Ha) and discard dump will be located a few meters south of the pit area on the mining area.

(f) the option of not implementing the activity.

By Nakedi Solutions not implementing the project, it risks loss of the money already spent on all processes taken thus far in order to obtain a Mining right as well as all the money spent to prospect together with the lodging of a Mining Right. Furthermore, the area is rich in varying grades of various ore which can be mined, processed and sold to the market for a profit. All these combined would mean that the country has lost in potential revenue (tax collection), failed our fellow country man by not developing the mine and creating jobs as well as potential loss of income for Nakedi Solutions combined with the SLP projects which will assist the communities in developing and providing school bursaries and learnerships for students so as to equip them with necessary skills.

There is an employment opportunity for the local skilled and unskilled as well a SLP obligation. The previous Mining operations in the area stopped long ago and it is assumed that it led to job losses, the introduction of a new mine will alleviate the stress on the unemployment.

ii) Details of the Public Participation Process Followed

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

The Public Participation Process will be conducted in terms of Chapter 6 of the NEMA together with the MPRDA, while the Public Participation is the involvement of all parties who are either potentially interested and/or affected by the proposed development. The principal objective of public participation is to inform and enrich decision-making which is also its key role in this Environmental Impact Assessment (EIA) process. Land-owners (affected and adjacent) were identified through a search conducted via online search engines (such as Windeed) accessing the Title Deed office database. Besides the land-owners, other relevant organisations were identified and notified of the application. This includes municipal and State departments (DWA, LEDET, SAHRA-Limpopo), Local & district Municipalities to name a few) with jurisdiction in the project area with an interest. All those whom were identified and registered during the Scoping phase will be automatically registered on the EIA Phase and sent notification for the meeting. (See consultation Annexure 1). These included the following:

1. Identification of key Interested and Affected Parties and other stakeholders including all relevant organs of state and other parties
2. Placement of site notices on farms, Tolwe & Baltimore areas, municipal area and other accessible public areas
3. Formal notification via E-mail of the application to key Interested and Affected Parties and other stakeholders including land owners and some of the neighbours;
4. Consultation and correspondence with I&AP's and Stakeholders and the addressing of their comments;
5. Draft Scoping Reporting consultation was done in July 2021, the final draft submitted on 04 November 2021 and the DMRE accepted it on the 30th of November 2021. This was done through notices on the farm gates, letters sent out as well as newspaper adverts with the meeting happening at Hunters Lodge/Sekhung Combined School in Tolwe (at 11h00) and also at Baltimore Primary School (at 13h30) on the 15th of August 2021.
6. EIA public participation meeting was conducted at the Sekhung Combined School in Tolwe (at 10h30) as well as at Baltimore Primary School (at 13h30) on the 24th of April 2022. All issues and responses from I&APs were documented by the Public Participation team and will be incorporated on the final EIA.
7. An advertisement was placed in Beeld Newspaper on the 25th of March 2022.

- **Scoping Phase Consultation**

The first Public Participation Process (PPP) meeting was held at Sekhung Combined School in Tolwe (at 11h00) and also at Baltimore Primary School (at 13h30) on the 15th of August 2021 while the newspaper of such meeting was advertised on the Beeld Newspaper (published on Thursday, the 29th July 2021). Individual letters to various Interested and affected parties were sent out as well as gate notice in each affected farm. Comments from the meeting were received and incorporated into the Scoping report before they were submitted to the DMRE. The Scoping report was subsequently accepted on the 30th of November 2021; with conditions.

- **EIA Phase Consultation**

The second public participation process is underway for the EIA and EMPr. The meeting was conducted on the 24th of April 2022, which was also subjected to a 30 days Public Participation period in which the I&APs had a draft EIA together with the draft specialist reports in order to gather views and incorporate them into the final report. Various I&APs were notified via E-mails (Letters), notices on their gates and newspaper adverts on Beeld Newspaper. Comments and views will be incorporated into the final EIAr before submitting them to the DMRE.

iii) Summary of issues raised by I&Aps

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

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.	Date Comments Received and Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
AFFECTED PARTIES	**THIS WILL BE ATTACHED ON THE FINAL EIA DOCUMENTAFTER THE CONSULTATION HAS BEEN CONCLUDED AND COMMENTS FROM I&APS HAVE BEEN RECEIVED.**		
Landowner/s			
Lawful occupier/s of the land			
Landowners or lawful occupiers on adjacent properties			
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA			
Communities			
Dept. Land Affairs			
Dept. Water and Sanitations DWS			
Other Competent Authorities affected			
OTHER AFFECTED PARTIES			
INTERESTED PARTIES			

iv) The Environmental attributes associated with the development footprint alternatives.(The environmental attributed described must include socioeconomic, social, heritage, cultural, geographical, physical and biological aspects)

(1) Baseline Environment

The baseline information provided here is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment.

- **Regional Setting**

The Limpopo Province is South Africa's northernmost province which shares borders with Mozambique, Zimbabwe and Botswana, making it the ideal entrance to Africa. Named after the great Limpopo River that flows along its northern border, this province is rich in wildlife, spectacular scenery and a wealth of historical and cultural treasures. Blouberg Local Municipality, which falls under the Capricorn District Municipality, is a Category B municipality situated in the northern part of South Africa, bordering Zimbabwe and Botswana. It is the largest of four municipalities in the Capricorn District, making up almost half of its geographical area. The Municipality takes its name from the Blouberg (literally meaning blue mountain), a mountain range located to the west of the western end of the Soutpansberg mountain range, north west of the town of Vivo. Blouberg is home to some of the most spectacular rock climbing in South Africa. The rock climbing destination is famous for its big wall natural climbing with route lengths up to 350m. The vegetation ranges from sub-tropical savannah at the base, to alpine near the summit.

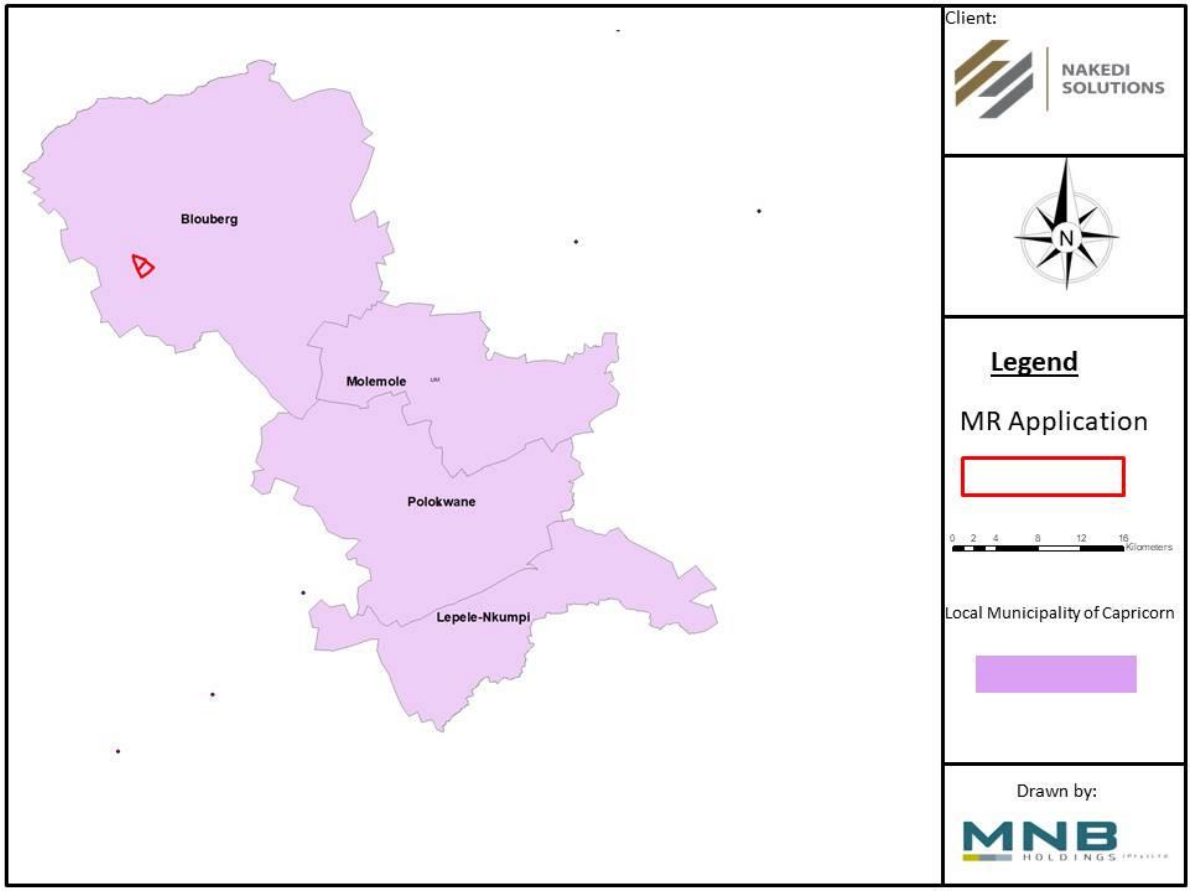


Figure 10: Map Location of Blouberg with reference to the Limpopo Province

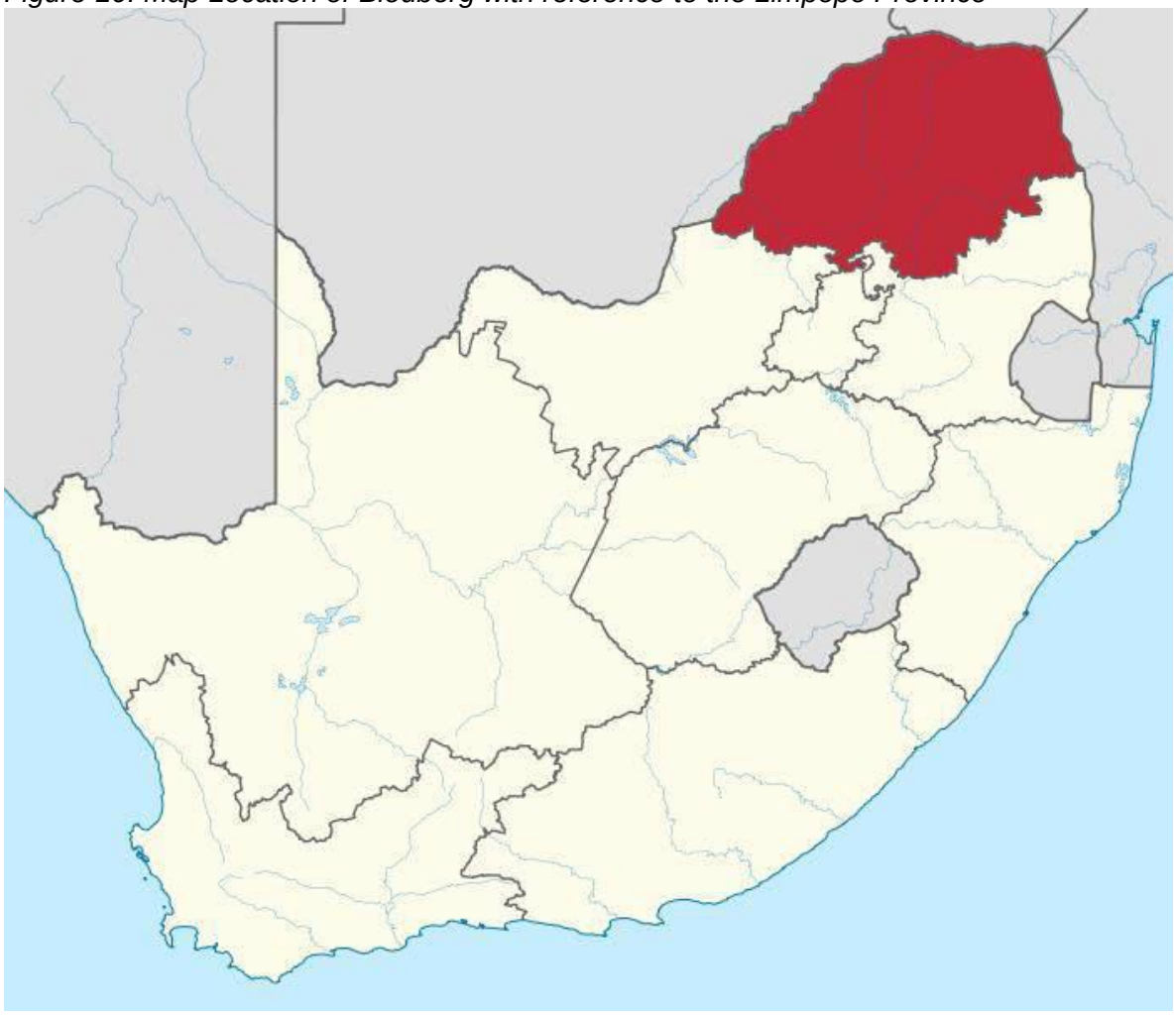


Figure 11: Limpopo Province Map

- ***Mining Industry***

Limpopo's rich mineral deposits include Platinum Group Metals (PGM), Iron Ore, Chromium, high- and middle-grade coking Coal, diamonds, antimony, Manganese, phosphate and copper, as well as mineral reserves such as gold, emeralds, scheelite, magnetite, vermiculite, silicon and mica. Base commodities such as black granite, corundum and feldspar are also found. Mining contributes to more than a fifth of the provincial economy.

The province is a typical developing area, exporting primary products and importing manufactured goods and services. It has a high potential for development, with resources such as tourism, rain-fed agriculture, minerals and abundant labour offering excellent investment opportunities.

❖ **Capricorn District Municipality**

Capricorn is one of the 5 districts of Limpopo province of South Africa. The district is named after the Tropic of Capricorn which runs through it. The capital of Capricorn is Polokwane. The vast majority of its 1,261,463 people speak Northern Sotho as their home language (2011 census). The district code is DC35. Since the what used to be the 5th municipality Aganang was amalgamated into other municipalities in 2016, the district remains with 4 municipalities, namely; Polokwane, Lepelle-Nkumpi, Blouberg and Molemole respectively.

The Blouberg forms part of the 'Vhembe Biosphere Reserve', named a biosphere reserve by UNESCO since 2009. This reserve also includes the neighbouring Makgabeng Plateau, the Soutpansberg, the northern part of the Kruger National Park, the Makuleke Wetlands and the Mapungubwe Cultural Landscape. The eastern and part of the central Blouberg prominences are enclosed and protected by the Blouberg Nature Reserve. A 4x4 track traverses Rapanyan's Neck, the defile that separates these easterly sub-ranges.

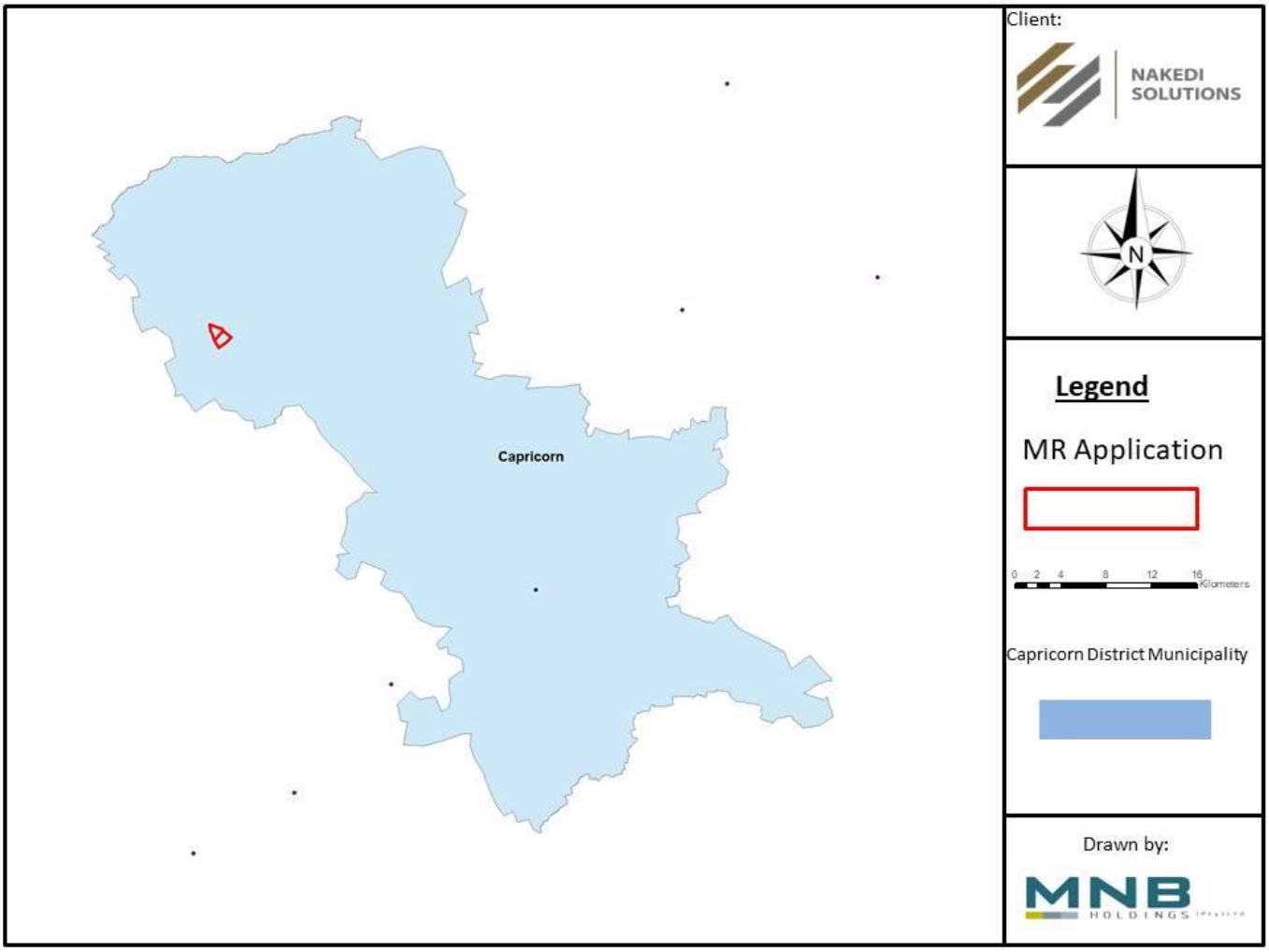


Figure 12: Capricorn District Municipality Map

- ***Agriculture***

According to the Blouberg Local Municipality's Local Economic Development Strategy; 2013, there is abundant land, which is mainly used for agricultural development. The area consists of two economies in the farming sector - the established and commercial white farming community and the less established and subsistence black farming community. The strategy identifies even game farming as one of the pillars of the agricultural sector especially the one practiced in areas around Alldays and the surrounding farms.

- ❖ ***Crop/Vegetable Farming***

According to the Limpopo Agro-Processing Strategy (2012) Blouberg Municipality is one of the biggest producers and exporters of tomatoes, onions and potatoes in the Limpopo Province alongside Molemole, and Makhado Municipalities and furthermore the strategy proposes that such production should be expanded. What is lacking is that the processing of these produce is not done in the respective municipalities but mainly in the province of Gauteng where finished products are sold at higher prices to these exporting municipalities. Furthermore, the strategy also identifies tobacco farming as one of the strong pillars of agricultural development in the Blouberg area.

Blouberg municipality is amongst others which have benefited from the Limpopo Industrial Development Corporation (IDC) Nguni Cattle Development Programme. The program me is a partnership between the Limpopo Department of Agriculture, IDC and University of Limpopo and to date the community of Juniors loop in ward 17 has benefited from the program me. However, institutional weaknesses on the programme for the benefitting community of Junior sloop have resulted in the collapse of the program me in 2017.

Other opportunities in farming involve game farming, which is also used for ecotourism in the south-western part of the municipality in areas such as Baltimore, Tolwe, Swartwater, and Maastroom, as well as in the regions northern and western parts of Alldays.

Some challenges encountered in the sector relate to poor skills, group approaches to the sector, which resulted in cooperatives running down established operations.. In terms of agricultural development, most white farmers farm on a commercial basis while most black farmers practice subsistence farming. Membership of organized commercial farmers. In the Blouberg area, white commercial farmers are affiliated to various organized farmers' unions such as Koedoesrand Landbou Unie (KDLU), Bo-Brakrivier Boerevereneging, Transvaal Agricultural Union, while black commercial farmers are affiliated to National African Farmers Union (Blouberg Local Municipality, 2021).

The total employment in the informal sector increased by 8.3% from 3511 people to 4233 between 2000 and 2010 and grew further by 7% to 5946 in 2016. The year on year growth in the informal sector reflects a growing economy that is however not able to accommodate all the economically active population.

- ***Eco Tourism***

Ecotourism is a form of tourism involving visiting fragile, pristine, and relatively undisturbed natural areas, intended as a low-impact and often small scale alternative to standard commercial mass tourism. It means responsible travel to natural areas, conserving the environment, and improving the well-being of the local people. Its purpose may be to educate the traveller, to provide funds for ecological conservation, to directly benefit the economic development and political empowerment of local communities, or to foster respect for different cultures and for human rights. Since the 1980s, ecotourism has been considered a critical endeavour by environmentalists, so that future generations may experience destinations relatively untouched by human intervention. This mainly refers to game hunting, trophy hunting, hiking, and game farms and nature reserves.

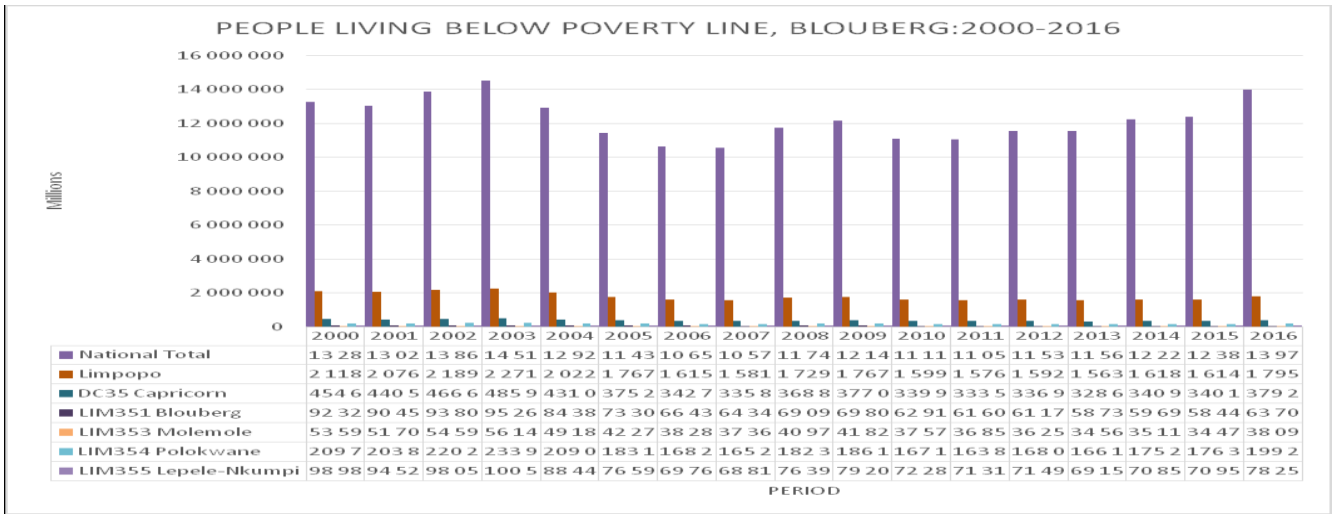
- ***Poverty levels***

The report conducted by Statistics South Africa in 2017 has revealed that despite the increase in the social wage sector covering almost 17 million of the population of South Africa poverty has worsened. Almost half of the population lives below the food poverty line and the number is expected to increase with the damage the Corona Virus has caused on the country's economy.

The report went further to mention that there is a gap between the social wage and the amount required to address the food poverty line challenge. The graph illustrates that the Capricorn district and its

constituent's municipalities have seen a decline in the number of people living below the food poverty line between the years 2000 and 2016. The number has declined from 92 329 in the year 2000 to 62 913 in the tear 2010 before rising to 63 913 in the year 2016.

The Blouberg local municipality has the highest proportion of people living below the food poverty line as compared to the other constituent municipalities.

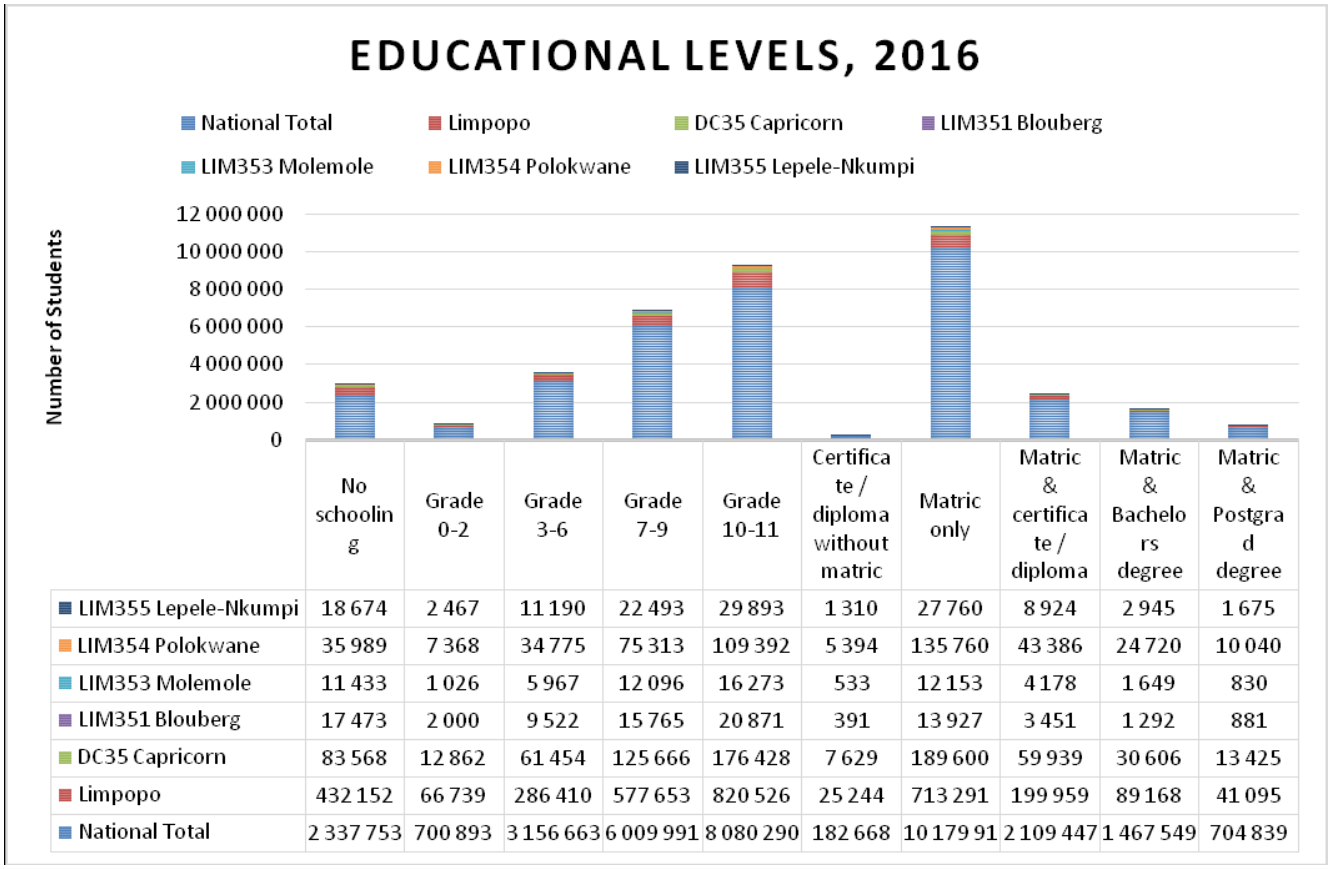


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
National Total	13 28	13 02	13 86	14 51	12 92	11 43	10 65	10 57	11 74	12 14	11 11	11 05	11 53	11 56	12 22	12 38	13 97
Limpopo	2 118	2 076	2 189	2 271	2 022	1 767	1 615	1 581	1 729	1 767	1 599	1 576	1 592	1 563	1 618	1 614	1 795
DC35 Capricorn	454 6	440 5	466 6	485 9	431 0	375 2	342 7	335 8	368 8	377 0	339 9	333 5	336 9	328 6	340 9	340 1	379 2
LIM351 Blouberg	92 32	90 45	93 80	95 26	84 38	73 30	66 43	64 34	69 09	69 80	62 91	61 60	61 17	58 73	59 69	58 44	63 70
LIM353 Molemole	53 59	51 70	54 59	56 14	49 18	42 27	38 28	37 36	40 97	41 82	37 57	36 85	36 25	34 56	35 11	34 47	38 09
LIM354 Polokwane	209 7	203 8	220 2	233 9	209 0	183 1	168 2	165 2	182 3	186 1	167 1	163 8	168 0	166 1	175 2	176 3	199 2
LIM355 Lepele-Nkumpi	98 98	94 52	98 05	100 5	88 44	76 59	69 76	68 81	76 39	79 20	72 28	71 31	71 49	69 15	70 85	70 95	78 25

Figure 13: Poverty levels within the Blouberg Local Municipality

- ***Education levels***

Blouberg Local Municipality has the second lowest number of people with matric and postgraduates degrees followed by Molemole as compared to Polokwane and Lepelle- Nkumpi municipalities within the Capricorn District Municipality. This level represents the highest level of skilled people in the population. Blouberg municipality has only 881 people in this segment compared to 13 325 people in the district. The Blouberg municipality's figure represents only 0.07% of the district percentage. ***f***igure below illustrates the number of years spent in schooling at the national, provincial, District as well as local level.



	No schooling	Grade 0-2	Grade 3-6	Grade 7-9	Grade 10-11	Certificate / diploma without matric	Matric only	Matric & certificate / diploma	Matric & Bachelors degree	Matric & Postgrad degree
LIM355 Lepele-Nkumpi	18 674	2 467	11 190	22 493	29 893	1 310	27 760	8 924	2 945	1 675
LIM354 Polokwane	35 989	7 368	34 775	75 313	109 392	5 394	135 760	43 386	24 720	10 040
LIM353 Molemole	11 433	1 026	5 967	12 096	16 273	533	12 153	4 178	1 649	830
LIM351 Blouberg	17 473	2 000	9 522	15 765	20 871	391	13 927	3 451	1 292	881
DC35 Capricorn	83 568	12 862	61 454	125 666	176 428	7 629	189 600	59 939	30 606	13 425
Limpopo	432 152	66 739	286 410	577 653	820 526	25 244	713 291	199 959	89 168	41 095
National Total	2 337 753	700 893	3 156 663	6 009 991	8 080 290	182 668	10 179 91	2 109 447	1 467 549	704 839

Figure 14: Illustration of the education levels in the area

- ***Employment profile***

The section analyses the employment trends within the provincial, Capricorn district and its constituent municipalities from a total employment and at the sectorial level on the dominant sectors of the Blouberg economy, which is the agriculture, mining, manufacturing and retail sectors.

Limpopo employment levels, which stood at 941 000 in 2016, contribute 7% to the total national employment of 15.78 million employed people. The Capricorn district with its employment levels of 267 000 employed people in 2016 constitutes 28.4% to the provincial employment whereas Blouberg employment which comprised 13 655 of employed people in 2016 constituted 5% of the district employment.

The economy of the municipality is growing by 1% annually. The municipality contributes 20% of the district GDP. The unemployment statistics stands at 24% with the youths and women mostly affected. The level of poverty is high and a person living under poverty line is 65 000. About 13 700 people are employed in the formal sector while about 6 000 are in the informal sector.

According to ***Figure 15*** below, employment rate of Blouberg declined by 1% from 9 178 to 9 130 between the years 2000 and 2010 before recovering by 6.7% to 13 655 in 2016. The year on year decline is in line with that of the economic activities.

The total employment in the informal sector increased by 8.3% from 3 511 people to 4 233 between the year 2000 and 2010 and grew further by 7% to 5 946 in 2016. The year on year growth in the informal

sector reflects a growing economy that is however not able to accommodate all the economically active population.

The agricultural sector employment trends in Limpopo and the Capricorn district reflects its performance at national level. The sector has been stagnant in the last 16 years and has only absorbed a few people. In the Blouberg the sector absorbed only 2 823 in 2016 noting that it had absorbed only 2 528 in 2000.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Limpopo	597 6	600 0	595 0	592 0	596 5	609 8	628 9	653 1	682 6	678 1	652 8	670 7	709 3	765 2	841 8	900 8	941 0
DC35 Capricorn	148 3	149 9	148 5	148 4	152 0	157 9	164 2	171 4	180 5	181 8	178 2	185 3	195 2	212 2	235 3	253 6	267 3
LIM351 Blouberg	9 178	9 256	8 991	8 720	8 678	8 814	9 014	9 289	9 710	9 590	9 130	9 359	9 844	10 70	11 89	12 89	13 65
LIM353 Molemole	19 95	19 83	19 43	19 19	19 46	20 08	20 84	21 64	22 43	22 12	21 07	21 41	22 45	24 34	26 92	28 93	30 41
LIM354 Polokwane	99 35	101 3	101 3	102 2	105 7	110 6	115 6	121 0	127 8	129 6	128 3	134 2	141 5	154 0	170 8	184 1	194 1
LIM355 Lepele-Nkumpi	19 81	19 50	18 78	18 28	18 17	18 38	18 78	19 46	20 49	20 49	19 75	20 32	21 35	23 15	25 67	27 70	29 17

Figure 15: Blouberg's employment profile

a. Type of environment affected by the proposed activity.

(Its current geographical, physical, biological, socio- economic, and cultural character).

Below are the key aspects of the baseline environment that are likely to impact on the scope of the impact assessment and management measures that are implemented, this is concluded based on the findings and recommendations of the specialist study reports and as well as other research conducted.

- **Air quality**

A change in ambient air quality will result in a range of impacts, which in turn, may cause a disturbance to nearby receptors. As a baseline, this section provides a short description of pre-

mining conditions in the area from which to measure changes as a result of the proposed project as per the Baseline Ambient Air Quality Assessment as conducted.

During the construction assessment phase it is expected that, the main sources of impact will result due to vehicle and machinery movement within the plant area and ground preparation. This is also the case during mining phase, where there will be huge dust generated during truck and vehicle movement, blasting and screening. This will involve the identification of possible sources of emissions and the provision of details related to their impacts. Construction and mining usually consists of a series of different operations, each with its own duration and potential for dust generation. Dust emission will vary from day to day depending on the phase of construction, the level of activity, and the prevailing meteorological conditions. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction operations at the site:

- Scraping;
- Debris handling;
- Emergency venting; and
- Truck transport and dumping of debris.

Limited air quality monitoring information is available in the Capricorn District, which makes it difficult to quantify the current state of the air quality in the District. The Air Quality Management Plan (AQMP) developed for the Capricorn District Municipality will ensure that the Municipality is proactive about their approach to air quality management and planning. Although overall air quality within the CDM is not considered to be poor, the introduction of measures to effectively manage and reduce air pollution will ensure that the air quality situation within the CDM does not deteriorate to unacceptable levels. One of the important air quality issues that the CDM needs to address is domestic fuel burning within many of the poorer areas within the CDM. Co-operation at all levels of government, as well as an informed public, is essential to the implementation of the AQMP as well as various strategies to improve the air quality situation with South Africa, and within the CDM (Walton, van Nierop, & Rautenbach, 2009).

To manage the environmental impacts and to ensure that the mine fulfill its legal obligations in regards to air quality, particularly dust emissions, a monitoring programme should be implemented which measures total suspended particulate and PM_{10}. Air Quality Management Plans should be developed and implemented. Recommendations made in the AQMP reports which may entail the upgrade of monitoring equipment, increasing the frequency of regular testing and calibration of new dust suppressant systems.

Results/Conclusion

Existing emission sources

Neighboring land-use in the surrounding of the proposed project area comprises predominantly of farming, game farming. These land-uses contribute to baseline pollutant concentrations via the following sources:

- *Ceased Mining sources:* Fugitive emissions from open cast mining operations mainly comprise of land clearing operations (i.e. scraping, dozing and excavating), materials handling operations (i.e. tipping, off-loading and loading, conveyor transfer points), vehicle entrainment from haul roads, wind erosion from open areas. The ceasing of the operations put some areas exposed to dust due to the fact that it is not being maintained like before.
- *Road Source:* The area applied for does not have a tar road beyond the R561 and as such, the locals use gravel road to move within their farms with no speed limit. During dry and hot times of the day, if vehicles drive at high speed would potentially generate a lot of dust.

➢ **Surface and groundwater**

- ***Surface Water***

There are no dams, rivers and ponds in the area which are natural except for the ponding which has been created by previous mining and due to rain over the years, the water has been found to have formed dams in the various pits.

Figure 16: The water pond as a result of previous mining activities

Quaternary Catchment

The applied Mining Right Area falls within quaternary catchment A63A of the Mogalakwena Catchment, and forms part of the Limpopo Water Management Area.

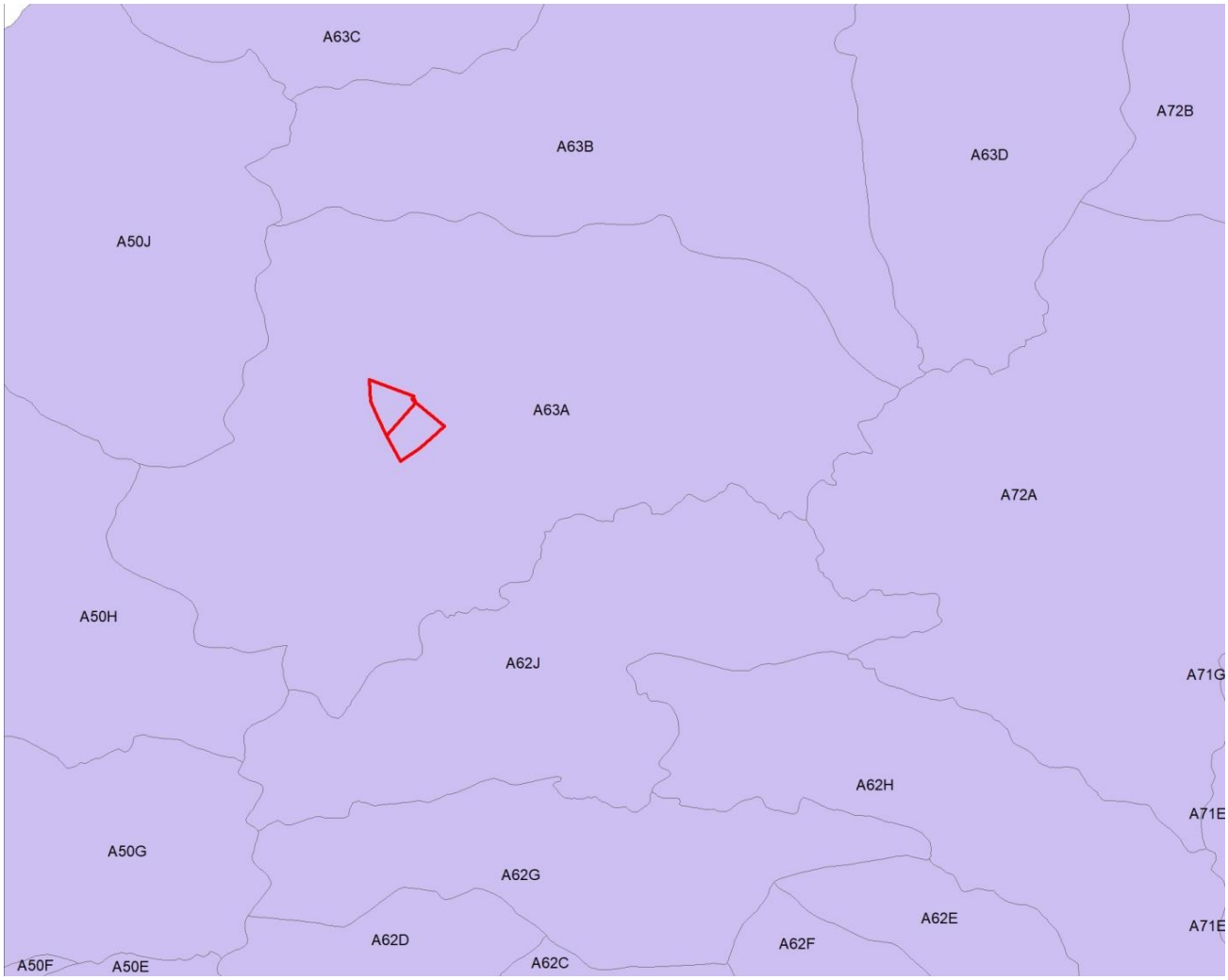


Figure 17: Quaternary Map

- ***Groundwater***

Possible contribution of groundwater contamination includes spillages hydrocarbons sourced from trucks and machinery, ablutions and domestic waste. The total cumulative impacts are low as this will be limited to the site. There is a possibility of impact on the water quality due to the ponding on old pits which were never rehabilitated; this will be confirmed during the hydrological studies phase when the qualities of ground and any surface water is tested. Silica, Manganese as well as Iron ore readings are expected to be slightly higher. The Groundwater Impact Assessment is yet to be conducted during the Water Use License (WUL) stage.

The report recommends that the Vadose zone for the mining area should be assessed and established. Furthermore, an erosion and erosion and sediment control and management plan should be considered. A detailed study in terms of Water Use License is yet to be conducted together with the related specialist studies, these are pending and will be made available to all registered once when the drafts are ready.

Geology

❖ Regional Geology

About 1 800 million years ago the Soutpansberg depositional basin was formed as an east-west trending asymmetrical rift or half-graben along the Palala Shear Belt. This belt formed between two major crustal blocks, e.g. the Kaapvaal craton in the south and the Limpopo Belt in the north. Deposition started with basaltic lavas and was followed by sedimentary rocks (syn-rift sequence). After an erosional period, pink massive quartzite was deposited (post-rift sequence) which covered a much larger area then the original rift. Until the deposition of the Karoo rocks the Soutpansberg rocks formed a flat featureless landscape. Only after sedimentation had ceased (about 150 million years ago) was the area strongly block-faulted and then uniformly tilted to the north. During the last ± 60 million years erosion formed the landscape as we see it today. The pink resistant quartzite was instrumental in shaping the present morphology. The Soutpansberg rocks which developed in a halfgraben subsided along a main border fault situated most probably some 10–20 km south of the present Soutpansberg mountainous area.

a. Stratigraphy

Although featuring so prominently in the landscape of the Limpopo Province, the Soutpansberg Group rocks did not attract much scientific attention in the past, since they are almost devoid of any economic mineralization. The rocks give rise to a mountainous, wedge-shaped terrain, which extends from the Kruger National Park in the east, where it is 40 km wide, to Blouberg in the west. Here it wedges out against the prominent Melinda and Senotwane Faults. Outliers occur west of Blouberg, on the banks of the Limpopo River, and in Zimbabwe. A correlate of the Soutpansberg rocks is the Palapye Group in Botswana.

The Soutpansberg rocks rest unconformably on gneisses of the Limpopo Belt and Bandelierkop Complex. Along the eastern and most of the northern margin the Soutpansberg outcrops are unconformably overlain by, or tectonically juxtaposed against, rocks of the Karoo Supergroup. The contact relationship between the Soutpansberg and Waterberg Group rocks is a tectonic one, though the latter rocks are believed to be younger. The Group is best developed in the eastern part of Soutpansberg, where the maximum preserved thickness is about 5 000 m.

The Soutpansberg Group represents a volcano-sedimentary succession which is subdivided into seven formations (Brandl, 1999). The basal discontinuous Tshifhefhe Formation is only a few metres thick, and made up of strongly epidotised clastic sediments, including shale, greywacke and conglomerate. The following Sibasa Formation is dominantly a volcanic succession with rare discontinuous intercalations of clastic sediments, having a maximum thickness of about 3 000 m. The volcanics comprise basalts, which were subaerially extruded and minor pyroclastic rocks. The basalts are amygdaloidal, massive and generally epidotised. The clastic sediments which include quartzite, shale and minor conglomerate, can reach locally a maximum thickness of 400 m. The overlying Fundudzi Formation is developed only

in the eastern Soutpansberg, and wedges out towards the west. It is up to 1 900 m thick, and consists mainly of arenaceous and argillaceous sediments with a few thin pyroclastic horizons.

Near the top of the succession up to four, about 50 m thick layers of epidotised basaltic lava are intercalated with the sediments. It is followed by the Wyllie's Poort Formation, which is an almost entirely clastic succession, reaching a maximum thickness of 1 500 m. Since the formation overlies, from east to west, progressively older units, its lower contact is interpreted to form a regional unconformity. Resistant pink quartzite and sandstone with minor pebble washes dominate the succession, with a prominent agate conglomerate developed at the base. The uppermost unit is represented by the Nzhelele Formation, which consists of a 400 m thick volcanic assemblage (Musekwa Member) at the base, followed by red argillaceous and then by arenaceous sediments. Maximum preserved thickness is of the order of 1 000 m. The volcanics consist of basaltic lava and several thin, though fairly consistent horizons of pyroclastic rocks of which one is copper-bearing.

North of the main Soutpansberg outcrop two additional units, the Stayt and Mabiligwe Formations, are recognized. The former succession which is preserved between two prominent faults has a maximum thickness of 1 800 m. Basaltic lava is developed at the base, followed by argillaceous sediments with thin interbeds of pyroclastic rocks. Agate conglomerate and pink quartzite are capping the top. Copper mineralization is known to occur in strongly fractured portions of the succession. The Mabiligwe Formation is confined to a small area along both banks of the Limpopo River, having a thickness of at least 50 m. It is entirely a clastic succession, with no volcanics developed except for a thin tuffaceous horizon (Barker, 1979; Brandl, 1981, 1986, 1987 & 2002).

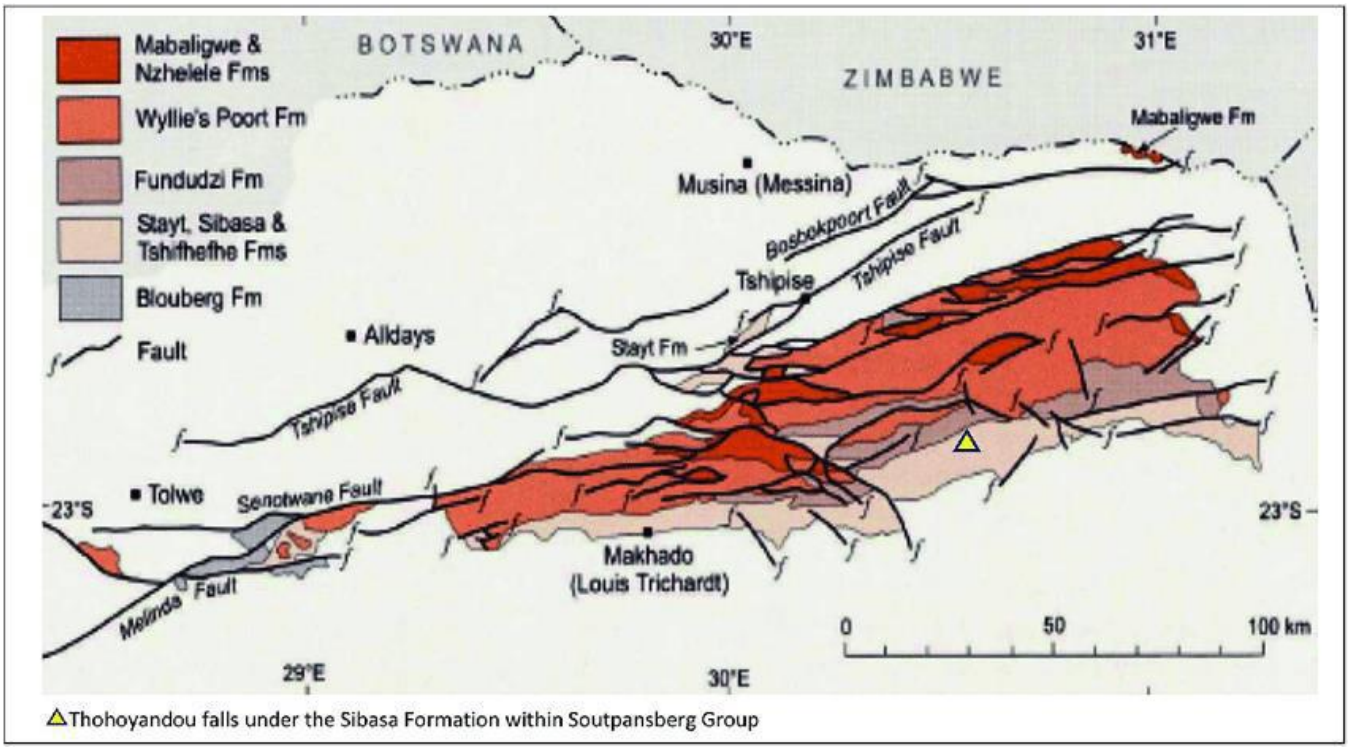


Figure 18: Illustration of the Simplified Geology of Wylliespoort Formation

❖ *Structural geology*

The Soutpansberg strata which are tilted gently towards the north are truncated by numerous extensional faults. Two fault systems are recognized, the dominant one trending ENE (parallel to the regional strike) and the other one NW to WNW. The structures generally delineate discrete elongated blocks. The majority of the faults are believed to have been initiated in pre-Karoo or even during Soutpansberg times, with most of the structures having been reactivated in post-Karoo times. The Soutpansberg rocks are unfoliated, but are in places strongly fractured.

a. Intrusive rocks

Dykes and sills of diabase are plentiful in the Soutpansberg rocks. The former intruded often along fault planes, whereas the sills were mainly emplaced along the interface of shale and competent quartzite. Some of the diabase intrusions are probably synchronous with the Soutpansberg volcanism.

❖ Local Geology

The project is exploiting the manganese from the Wylliespoort Formation. The Wyllies Poort Formation is composed of red-pink quartzite with minor pebble washes. The base is marked by a prominent agate pebble conglomerate, and in the east, minor basaltic and pyroclastic intercalations are present (Barker et aI.,in press). Jansen (1976) assigned all Soutpansberg Group strata in the Blouberg area to the Wyllies Poort Formation, which is characterised by light-coloured quartzite, with locally developed pebble washes, conglomerates and mudstone pellets. The presence of interbedded lavas, tuffs, argillaceous rocks and diabase sills was only inferred by the presence of rubble, as outcrop quality is exceptionally poor. Rarely outcropping lavas are coarse-grained, epidotised and often amygdaloidal. Significantly, Jansen (1976) assigns none of the lavas in the Blouberg area to the volcanic Sibasa Formation of the Soutpansberg Group. Meinster (1977) did not believe that the mature sediments of the Wyllies Poort Formation (typically re-crystallised to quartzite with well-rounded quartz pebble washes) could have formed within an active fault-bounded rift, and proposed that these sediments had been transported a considerable distance, rather than from the proximal edges of a graben. To account for such mature sediment, Meinster (1977) proposed that the Soutpansberg had been preserved, rather than having been deposited, in a graben type structure, hinting that the Soutpansberg Group may have been developed over a wider area than the present extent of outcrop suggested

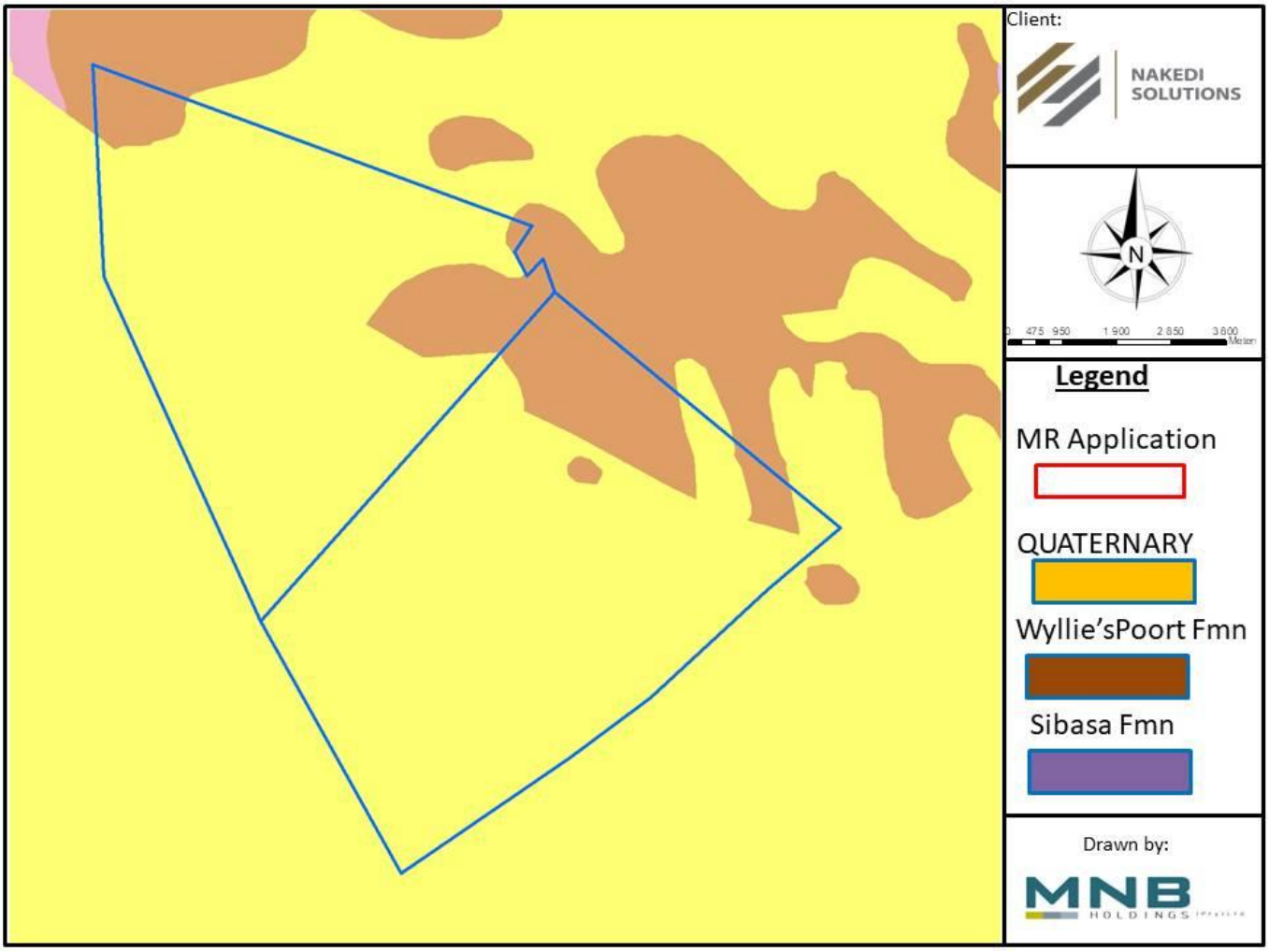


Figure 19: Geological Map of the applied Mining Right Area

- **Climate & *rainfall***

Mokopane's climate is a local steppe climate. During the year there is little rainfall. This location is classified as BSh by Köppen and Geiger. The average temperature in Mokopane is 19.0 °C. The annual rainfall is 550 mm. The area is characterized by summers are long, warm, and partly cloudy and the winters are short, cool, dry, and clear. Between the driest and wettest months, the difference in precipitation is 112 mm while throughout the year, temperature typically varies from 5.6°C to 28.9°C and is rarely below 2.8°C or above 33.3°C.

The climate for the overall Blouberg municipal area ranges between 18^0 C in the mountainous areas to 28^0 C in the rest of the area, with an average of 25.5^0 C. Maximum temperatures occur during the month of January while the minimum temperatures occur in July. The main period for rainfall is January to February with an annual rainfall of 450mm in the low-lying plains to 230mm in the Soutpansberg. The general average rainfall for the Municipal area ranges between 450mm to 800mm. The areas north of the Soutpansberg have less rainfall than the lower western foothills and central and eastern high lying areas of the mountain itself. In conclusion, higher rainfall occurs on the higher lying areas of the Soutpansberg and foothills of the mountain.

❖ ***Temperature***

The warm season lasts for 5.8 months, from September 27 to March 22, with an average daily high temperature above 27.2°C. The hottest day of the year is February 9, with an average high of 28.9°C and low of 18.3°C. The cool season lasts for 2.2 months, from May 30 to August 3, with an average daily high temperature below 22.2°C. The coldest day of the year is July 8, with an average low of 5.6°C and high of 20.6°C.

❖ ***Rainfall***

The rainy period of the year lasts for 7.3 months, from September 24 to May 3, with a sliding 31-day rainfall of at least 12.7mm. The most rain falls during the 31 days centred around December 1, with an average total accumulation of 73.66mm.

The rainless period of the year lasts for 4.7 months, from May 3 to September 24. The least rain falls around July 26, with an average total accumulation of 2.54mm.

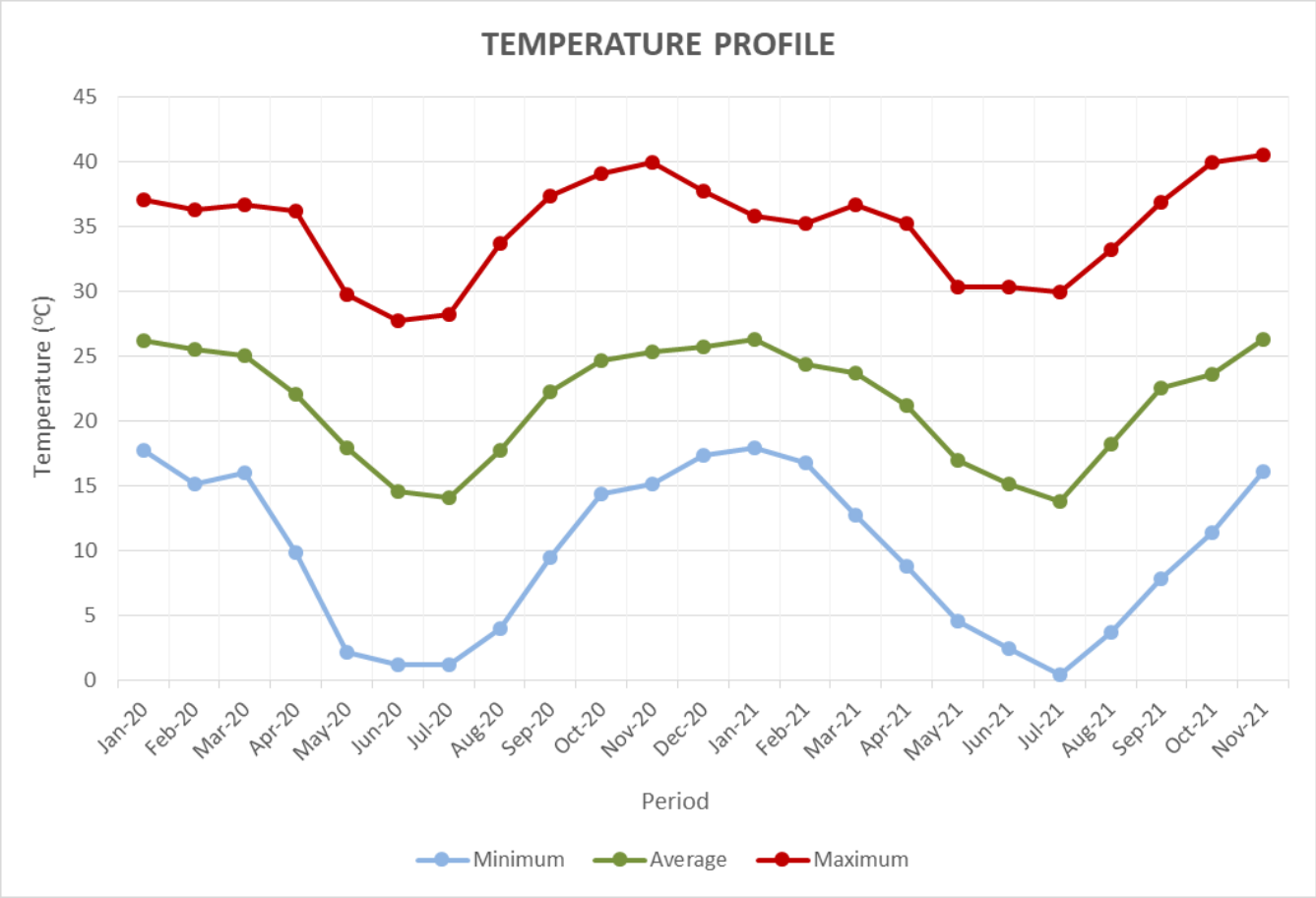


Figure 20: Average temperatures and precipitation for the Mokopane area

❖ ***Wind***

Dispersion is a term used to describe the combination of diffusion and advection, which takes place in the lower stratosphere (Elperin et al., 2016). According to Harrison and Hester (2015), a linear relationship exists between the concentration of a pollutant in the atmosphere and the rate at which the pollutant is emitted from the source. Topography, meteorological factors, and chemical

interaction between the PM and other components in the atmosphere plays a major role in the residence time and dispersion of pollutants in the atmosphere (Johnsson et al., 2013). Topography refers to the layout of the land with regards to presence of mountains, flat land, valleys and other man-made structures (Harrison & Hester, 2015). Tall structures have the ability to slow down or change the direction of the pollutants movement because they create “dead zones” or turbulence (Zeng & Zhang, 2017). Valleys can change the direction of the flow and the wind speed, resulting in the deposition of these pollutants (Tabinda et al., 2019).

Studies have shown that meteorological conditions can accumulate, dilute and even diffuse pollutants (Wang & Ogawa, 2015). Atmospheric temperature has an effect on the formation of PM. Higher atmospheric temperatures can promote photochemical reactions between the different compounds and PM in the atmosphere (Wang & Ogawa, 2015), which can result in the formation of complex compounds that could cause more damage to the environment and human health. A study conducted by Wang and Ogawa (2015) demonstrated a positive relationship between the increase in temperature and the concentration of PM2.5.

While the wind direction provides a pathway for the dispersion of pollutants in the atmosphere, wind speed determines the extent to which these pollutants are dispersed in the atmosphere (Zeng & Zhang, 2017). Several studies have shown that slow winds over a longer period result in higher concentrations of pollutants closer to the source or in the area where the wind speed is slow (Batterman et al., 2014; Wang & Ogawa, 2015; Duo et al., 2018). The rate of deposition is strongly influenced by the particle size and meteorological conditions such as convection, rainfall and humidity (Johnsson et al., 2013). When the humidity is high, the particles increase in size and can no longer stay afloat in the atmosphere (Zhao et al., 2014).

The meteorological data was obtained from the South African Weather Services’ weather station located in Lephalale. The data obtained include wind speed, wind direction, temperature, humidity, barometric pressure and rainfall.

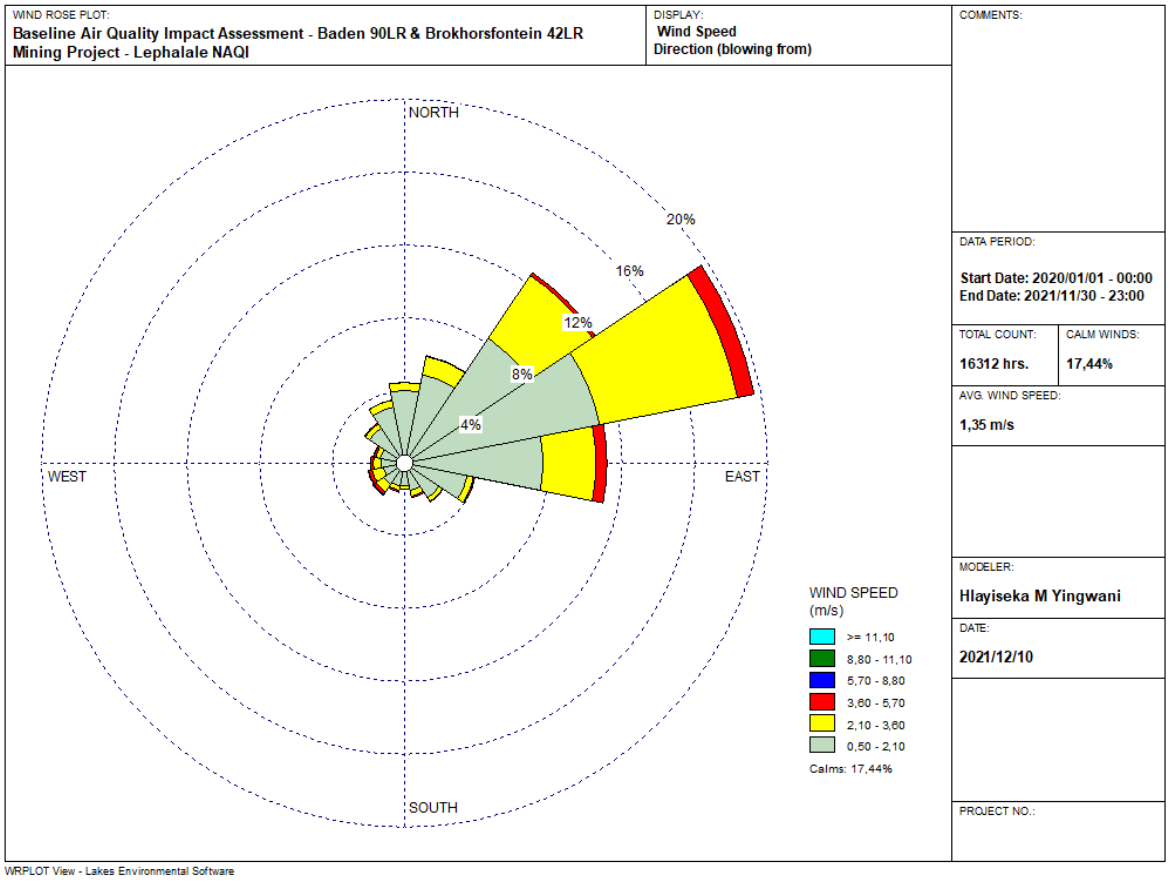


Figure 21: Wind rose, 24 Hours (January 2020 – November 2021)

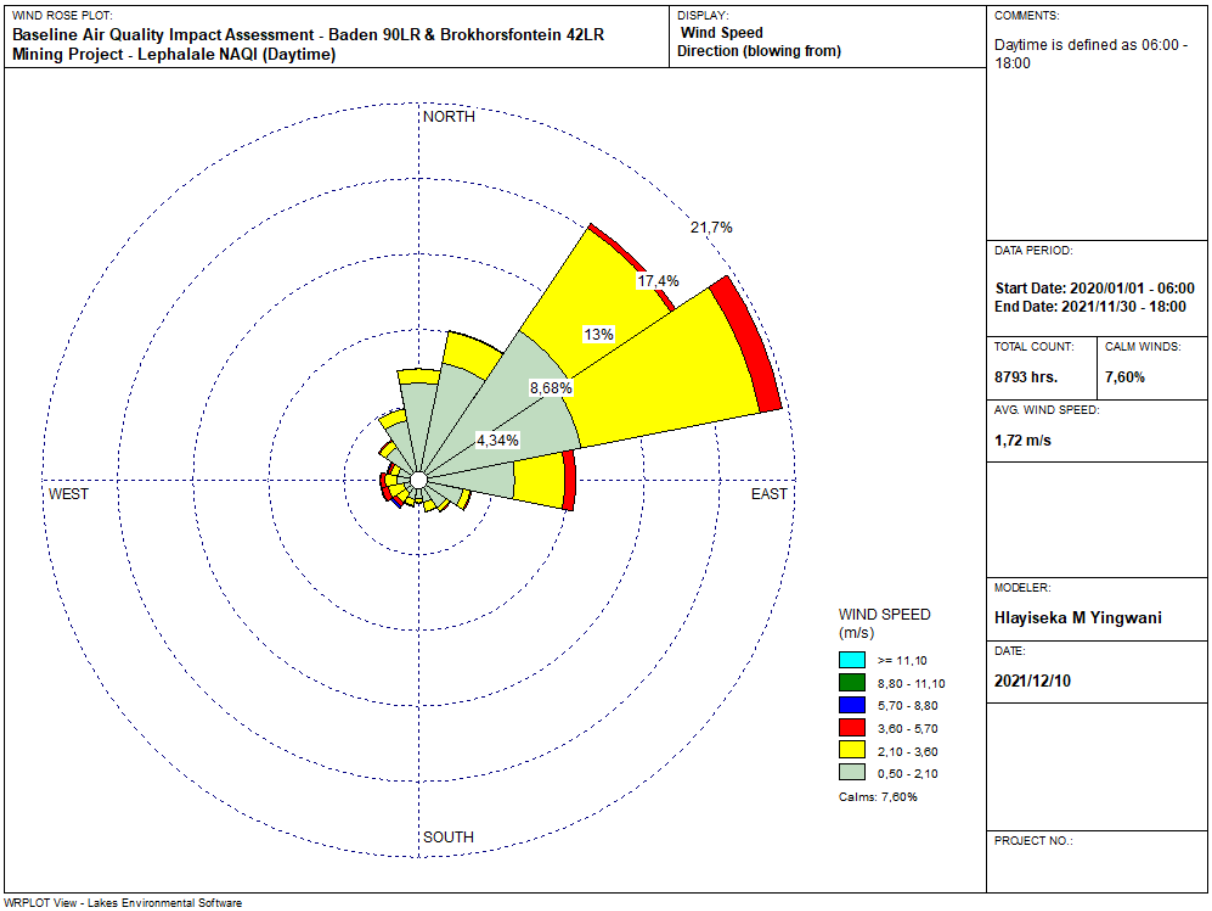


Figure 22: Wind rose, daytime (January 2020 – November 2021)

- **Soils**

The only comprehensive account of the soils of South Africa is that by Van der Merwe (1940). The classification of South African soils has nevertheless evolved, with the publication of numerous regional studies, through various approximations and is currently well established, with 73 soil forms constituting the highest level grouping (Soil Classification Working Group 1991). A new account is now available (Fey 2010) which covers geographic distribution, properties (including selected profile descriptions and analytical data), classification (including correlation with major international systems), genesis, and environmental significance.

The objectives of this project are to present a synopsis of the soil groups that were created as the basis for this general account, to show their distribution and frequency of occurrence, and to broadly indicate how they relate to the groups of the World Reference Base (IUSS Working Group WRB 2006). The fourteen soil groups have been created (Fey 2010) with the guiding principle being the identification of a diagnostic horizon, as defined by the Soil Classification Working Group (1991), so as to construct an eliminative key which is similar in operation to those employed by a number of international classifications.

A representative illustration of each group is provided in ***Figure 23*** below. If one of four special kinds of topsoil horizons is not present (i.e. the topsoil is orthic) then the direction and degree of development of the subsoil are considered. If none of the seven categories of subsoil development is sufficiently expressed then the soil is placed in one of the remaining, immature soil groups which are differentiated on the basis of three broad categories of parent material. The applied Mining Right site is predominantly located in the Rubic Arenosol and Rhodic Cambisol soil type.

The Environmental Potential Atlas of Southern Africa (ENPAT) classifies soil types in terms of their agricultural potential. In the municipality, there are three types of soils and they differ with regard to their agricultural potential.

- ***High Potential Soils***- These types of soil are suitable for agricultural development and it is found in the areas along Blouberg Mountains and Mogalakwena River. It is good for crop farming and livestock grazing.
- ***Moderate Potential Soils-***The soils are moderate and often used for subsistence farming and are found in the southern and eastern part of the municipality
- ***Low Potential Soils-***The soil is not suitable for agricultural development because they have very low clay content and they are widespread in the north- eastern and southern parts of the municipality

Soils with special topsoil characteristics	1	Organic	Wetland or montane peat	Organic O
	2	Humic	Humus enrichment; free drainage; low base status; humid climate	Humic A
	3	Vertic	Swelling, cracking clay; basic parent material; semi-arid to sub-humid climate	Vertic A
	4	Melanic	Dark, structured clay; high base status; semi-arid to sub-humid climate	Melanic A
Soils with special subsoil characteristics relating to pedogenic accumulation and having an orthic topsoil	5	Silicic	Cementation by amorphous silica or sepiolite; arid climate	Dorbank (duripan) or sepiocrete
	6	Calcic	Carbonate or gypsum enrichment; arid climate	Soft or hardpan carbonate or gypsic B
	7	Duplex	Marked textural contrast through clay enrichment	Pedocutanic or prismacutanic B
	8	Podzolic	Metal humate enrichment; siliceous parent material	Podzol B
	9	Plinthic	Absolute iron enrichment; localised, hydromorphic segregation with mottling or cementation	Soft or hard plinthic B
	10	Oxidic	Residual iron enrichment through weathering; uniform colour	Red apedal, yellow-brown apedal or red structured B
	11	Gleyic	Protracted reduction in an aquic subsoil or wetland	G horizon
Young soils with an orthic topsoil but weakly developed subsoil	12	Cumulic	Incipient soil formation in colluvial, alluvial or aeolian sediment	Neocutanic or neocarbonate B, regic sand, thick E horizon or stratified alluvium
	13	Lithic	Incipient soil formation on weathering rock or saprolite	Lithocutanic B or hard rock
	14	Anthropic	Human disturbance	Disturbed material

Figure 23: Soil Type Groups

Figure 24: Soil types around the project area

- **Land use and land capability**

- ***Agricultural capability***

Land capability is the combination of soil suitability and climate factors. The valley area has a land capability classification, on the 8 category scale, of class 3 – moderate potential arable land. The mountain areas have a land capability classification of class 8 - non-utilizable wilderness land, due to the mountainous terrain and the rock. Cultivation of the valley slopes is possible, but without irrigation is likely to be marginal.

- ***Land use and development at the site***

The current land use is dwelling and there is and livestock farming; mainly cattle and goats. Also, there is a history of mining activity which the mining has ceased for more than 20 years.

- **Land *capability***

The land capability of the proposed site where mining activities will take place can be defined as livestock farming, which offers hunting, eco-tourism, accommodation and game-breeding.

Mining activities involve the Mine, but may affect land available for grazing and will increase the potential for soil erosion as soil erosion in the project area is minimal. The fencing of the project area will exclude

animals from grazing, thus improving vegetation growth in the area. Soil pollution from domestic waste and use of hydrocarbons spillages may occur. Thus, the activities will result in a potential increase in soil contamination. Soils that have been stripped can never be replaced in their original state due to the alteration of physical, chemical and biological soil properties during removal and stockpiling. Stockpiling influences soil properties negatively while the duration of the soil stockpiling in addition, causes soil deterioration, especially soil biological quality. The cumulative impact on regional land capability and land use is low due to the land use being predominately for agriculture which is dominated by grazing and used for housing. Thus, the activities will result in a low significance cumulative impact only being limited to the site and its immediate surroundings.

- **Vegetation Types and biophysical descriptions of the applied Mining Right area**

The project area falls within the Roodeberg Bushveld, which falls under the Central Bushveld group.

- ***Roodeberg Bushveld:*** Is a unit which is distributed in the Limpopo Province, straddling the tropic of Capricorn, from Marken and Villa Nora in the south through Blouberg and Lerataupje Mountains in the north east. The altitude ranges between 850 and 1100masl. Vegetation features include plains and slightly undulating plains, including some low hills with short closed woodlands to tal woodlands and poorly developed grass layer.

Because of the subtropical climate of South Africa; 'subtropical fruit' are the best to cultivate in this area, mainly because they are climate adaptive crops. Subtropical fruits are citrus fruits, as well as olives, dates, figs, currants, raisins and nuts. Different nut trees are possible, like almonds, hazelnuts, walnuts, cashews, Brazil nuts and pecans. Citrus fruits such as oranges, tangerines, grapefruit and lemons are also an option. The only disadvantage of those three is that they need 2000 millimeter water per year.
Other crops like cucumber, asparagus, baby marrows, barley, beetroot and even carrots are possible to grow in this region. The best types to grow in combination with the irrigation system are carrots, baby marrows, sweet corn, tomatoes, brinjals and chillies. Most of those plants can be harvest in 11 till 17 weeks and Baby marrows can be harvested in 6 weeks

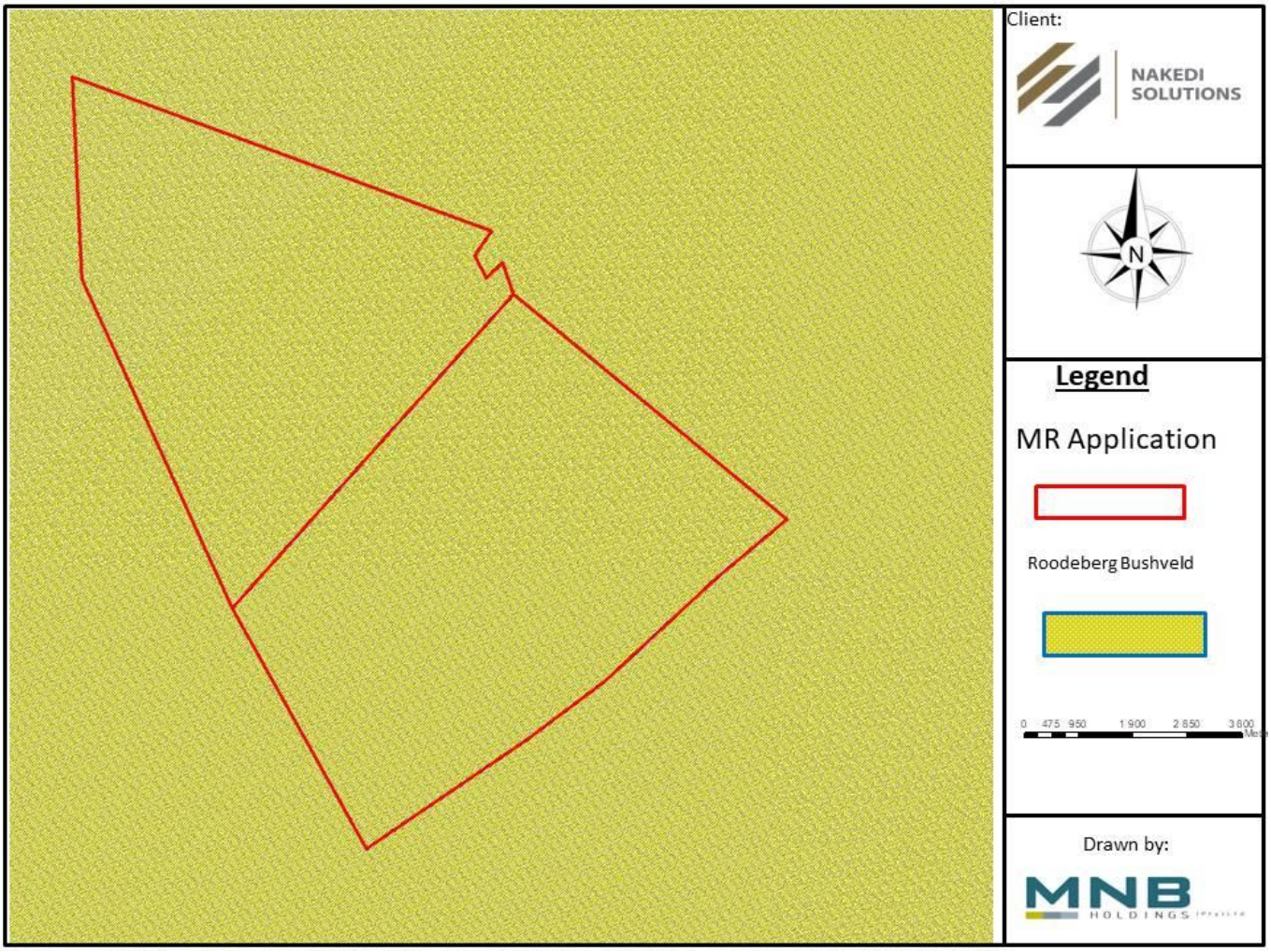


Figure 25: Vegetation map of the applied area

❖ **SENSITIVE AREAS**

Environmentally Sensitive Areas (ESAs) are land and water areas containing natural features or ecological functions of such significance as to warrant their protection in the best long-term interest of the people and environment. The following areas were observed within the study area and are deemed high of ecological importance:-

- *Mountains and Ridges*

These areas are of particular importance for both faunal and floral biodiversity conservation, plant endemism is always greatest on surface rock comprised of norite, pyroxenite and anorthosite. The ridges are particularly floristically diverse with a wide variety of woody trees such as *Kirkia wilmsii*, *Catha sp* and *Combretum sp*, shrubs, herbs such as *Commelina africana*, *Ledebouria revoluta*, *Asparagus* sp. and *Xerophyta retinervis* as well as succulent taxa such as *Aloe marlothii*.

These areas are also the most likely to support significant populations of endemic species due to the prevalent topography. These geological and topographical features and unique vegetation composition in turn provide for specialist niche faunal habitats capable of supporting relatively endemic species especially small mammal families such as *Soricidae*, *Lorisidae, Cricetidae* and *Muridae*.

Maintenance of the vegetation on the ridges is also critical in terms of stormwater management and the prevention of erosion. Many of the woody species encountered in the ridge areas are, however, utilised medicinally such as *Sclerocarya birrea* and *Dombeya rotundifolia* and for firewood therefore biodiversity conservation efforts will have to address the needs of the local communities too. Whereas, mixed Bushveld and Plains are characterised by trees such as *Kirkia wilmsii*, a species that is relatively rare in other parts of the Mixed Bushveld. This habitat unit remained largely undisturbed. The Bushveld habitat has the potential to support various bigger mammal species of concern such as *Orycteropus afer* (Aardvark) which is considered rare by the South African Red Data List.

Sensitive Landscapes

The Department of Environmental Affairs (DEA) classifies sensitive landscapes as either naturally conserved or ecologically sensitive, having unstable physical environments, being of social or scientific significance or being nature reserves, aquifer recharge areas or green belts.

Aspects identified as sensitive within the project site include:

- Terrestrial biodiversity (conservation important endemic flora and fauna species); and
- The erosion potential of the soils (due to the inherent physical and chemical properties, combined with the steep topography).

In terms of Limpopo Conservation Plan, the proposed project falls within Ecological Support Area 1, Critical Biodiversity Area 1, Critical Biodiversity Area 2 and No Natural Remaining, (see ***Figure 26*** below). Although the sensitivity map shows that site falls within these conservation areas, ground-truthing revealed that the proposed project site has been previously transformed as a result of anthropogenic activities which include mainly crop and livestock farming.

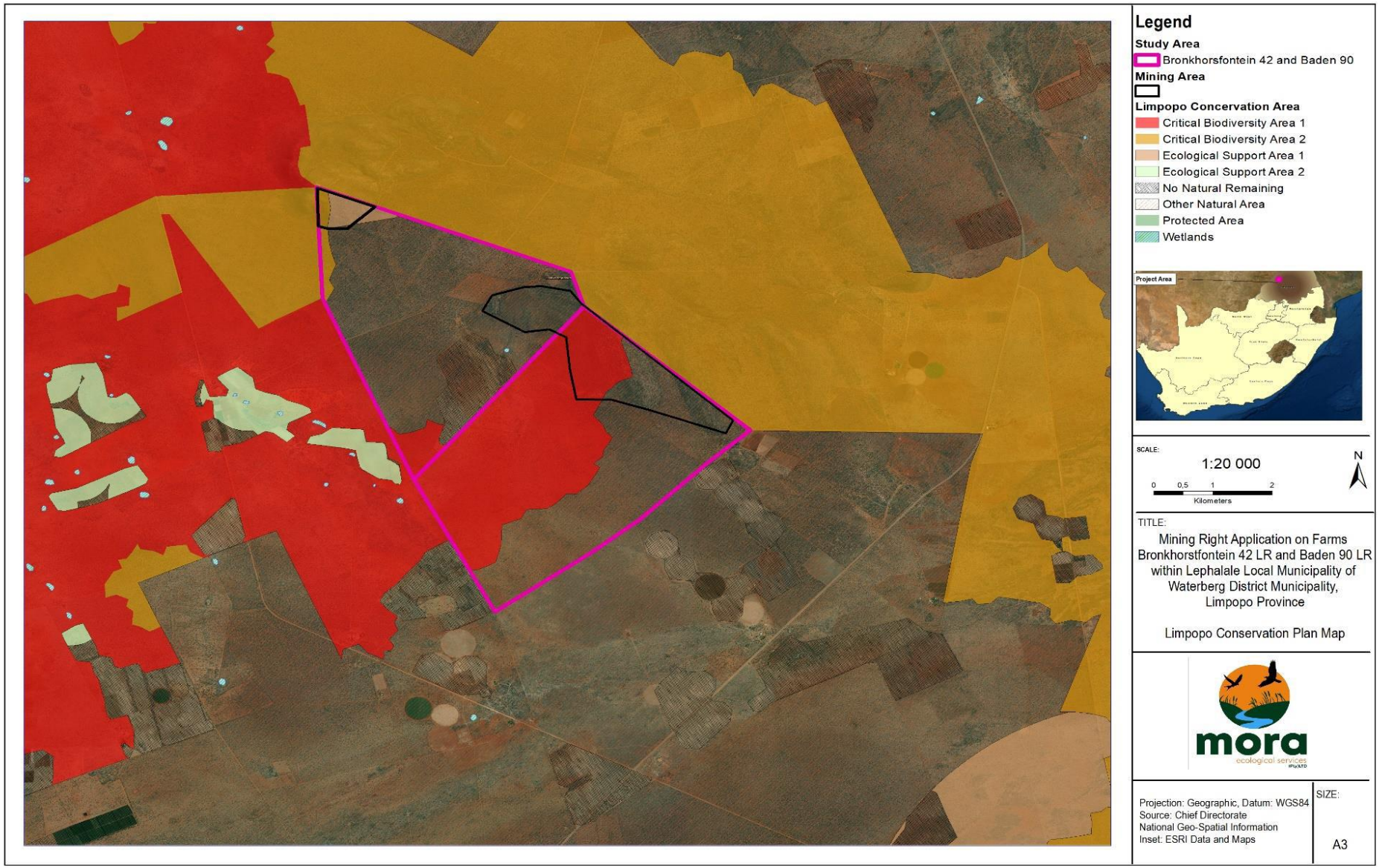


Figure 26: Conservation Plan map of the study site.

Figure 27: Sensitivity map of the study site.

- **Topography**

The southern side of the project area is highly mountainous while the remaining northern part of the area is relatively flat. The southern section varies from 920masl to 925masl, while the northern section is relatively to 1140masl to 1146masl.

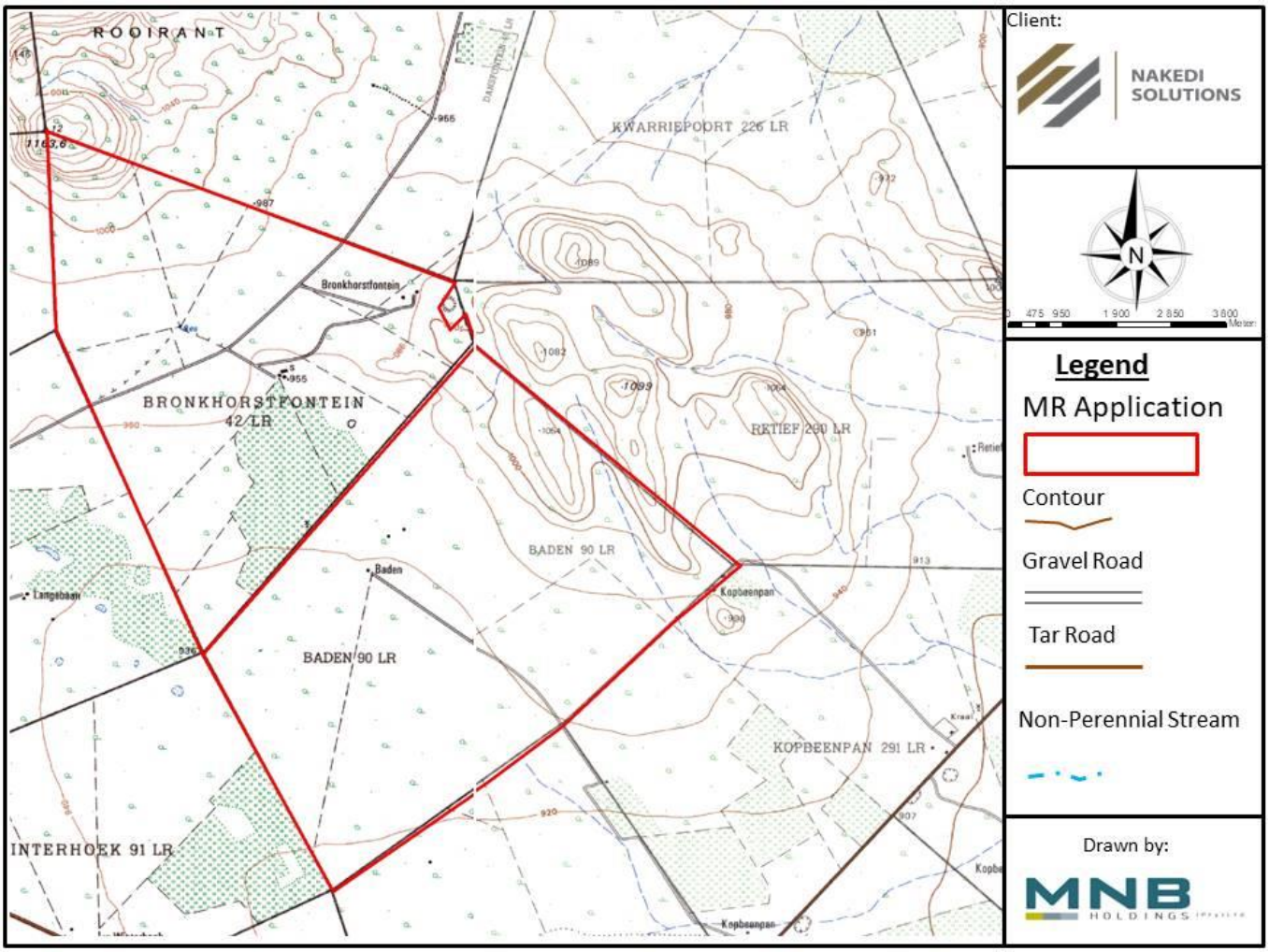


Figure 28: Topography of the Area

- **Transport, Infrastructure and logistics**

Due to the fact that there was Mining activity in the past, the applied area is easily accessivle from the N11 through numerous roads including gravels and tar road of R561. This does put this project in a very lucritive area in terms of transportation and logistics wise. Given the location and remoteness of the area, there will be little to no disturbances of the intersections of the roads though traffic in an around the area will be affected and increased ranging from work force to trasporting of ore. The various farms have a lot of gravel roads inside their own farms and we anticipate to slightly increasing the road on areas where the trucks will be turning for the collection of ore while 90% of the travelling and transporting will be done inside the two farms concerned.

Should there be any infrastructure (e.g. powerlines) of concern within the mining right area, there will be a 100m buffer-zone from the as per the MHSA.

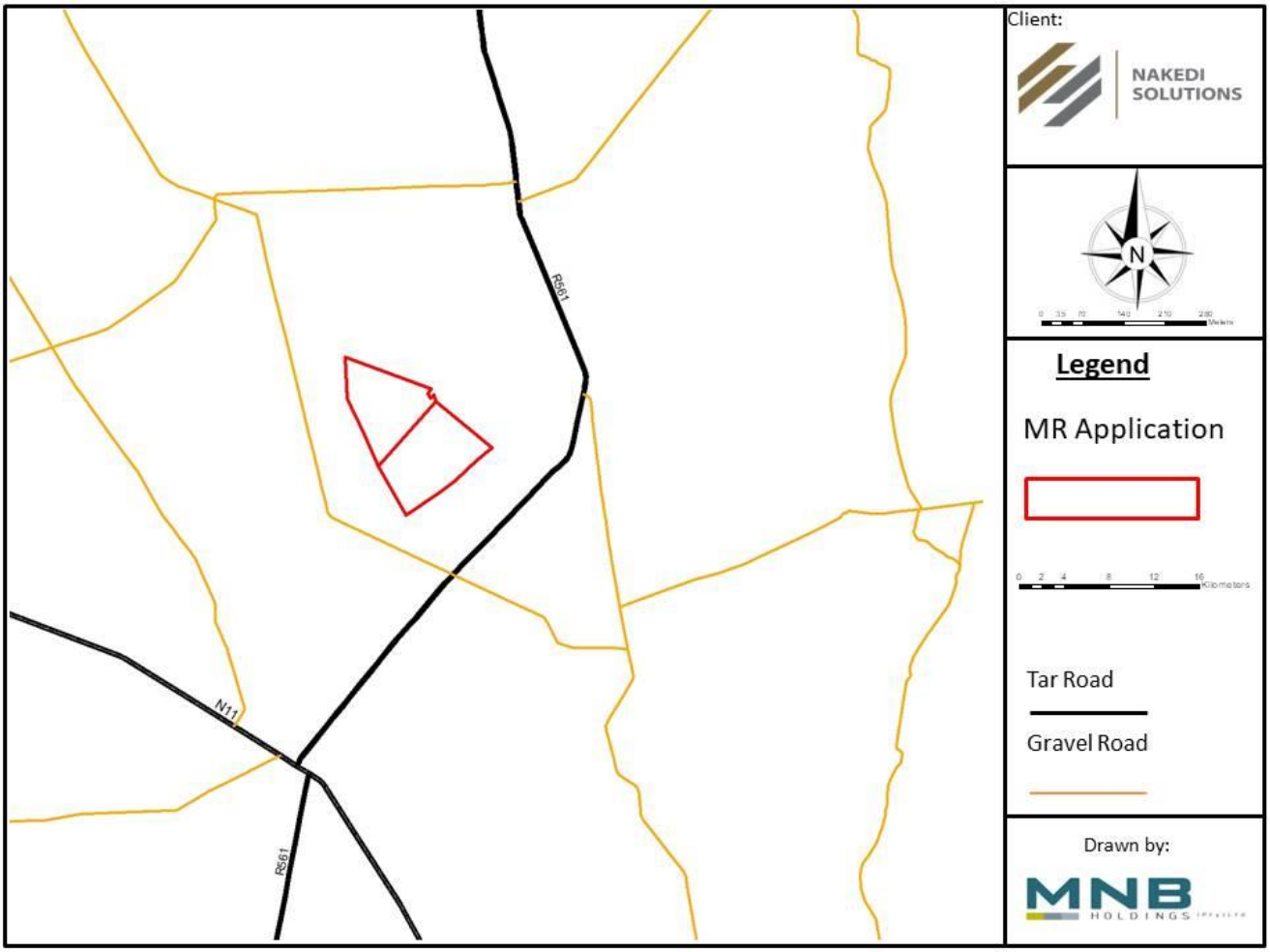


Figure 29: Infrastructure Map

b. **Description of the current land uses.**

The current land use is dwelling and there is and animal farming; mainly cattle and goats. Also, there is a history of mining activity which the mining has ceased for more than 20 years.

Figure 30: Evidence of animal droppings as observed during the site visit

Figure 31: Old crushed material as well as access roads from the previous mining entity.

c. Description of specific environmental features and infrastructure on the site.

The farm is mostly vacant with some few houses and cattle/livestock kraal. There are power lines that run in a north to south direction and also a Vodacom tower on the western edge of the farm which will not be impacted by this operation. No mining will happen within a 100m from any infrastructure.

The environmental features and infrastructure in the proposed project area are described in this section. In summary:

- Soils are well-drained sandy soils, which allow for high infiltration rates, low organic content and are highly erodible; The project area has no graves which will require preservation and a 100m buffer zone will be applied for any accidental find;
- No wetlands are located within the proposed project area however; there is predominantly 1 river closes to the prospecting area which is the Mogalakwena river but nothing within the project area;
- Third party boreholes located outside the project site and surrounding farms are utilised for livestock, game farming and domestic purposes including on site

Figure 32: Cattle kraal as evidence of farming

d. **Environmental and current land use map.**

(Show all environmental and current land use features)

Figure 33: Farm Portions with reference to associated infrastructure

Figure 34: Current infrastructure within the applied area

Heritage

In terms of section 38 of the National Heritage Resources Act, 1999 (Act no. 25 of 1999), a comprehensive heritage impact assessment (HIA) investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *said act* and focuses on the survey results from a cultural heritage survey. The HIA study was undertaken in order to establish if any localities of heritage significance were present on the property and no sensitive areas were identified and as such the project in terms of heritage has been given an approval from an independent consultant.

- ***Baseline Traffic***

Conditions of the Local Road Network

The study area for the proposed establishment of an open cast mine development is around the Baltimore area, of which the project is located 170 km North-West of Mokopane Town as well as at approximately 15 km north east of Baltimore Town which is along N11. There are two main roads in the area; the N11 National road, the R561 tar road into Tolwe which lead to gravel roads leading into the affected farms.

According to the Traffic Impact Assessment conducted by DZ Investments, traffic generated or attracted by the proposed mining has no significant impact on the level of service on the nearby roads and intersections. Therefore, there is no need for any road geometric upgrades. Moreover, the reports futher states that the introduction of heavy vehicles, albeit low volume, due to the mining operations will lead to further deterioration of the gravel roads. It is recommended to upgrade gravel to asphalt surfaced roads to mitigate pavement deterioration and dust.

- ***Socio economic and demographic profile***

The section deals with the population trends, gender distribution, unemployment, education, income levels and age. The Blouberg as one of the municipalities in the Capricorn district has the second lowest population after Molemole municipality. It contributes only 13% of the district population. Polokwane municipality has the biggest population of 60% followed by Lepelle –Nkumpi municipality.

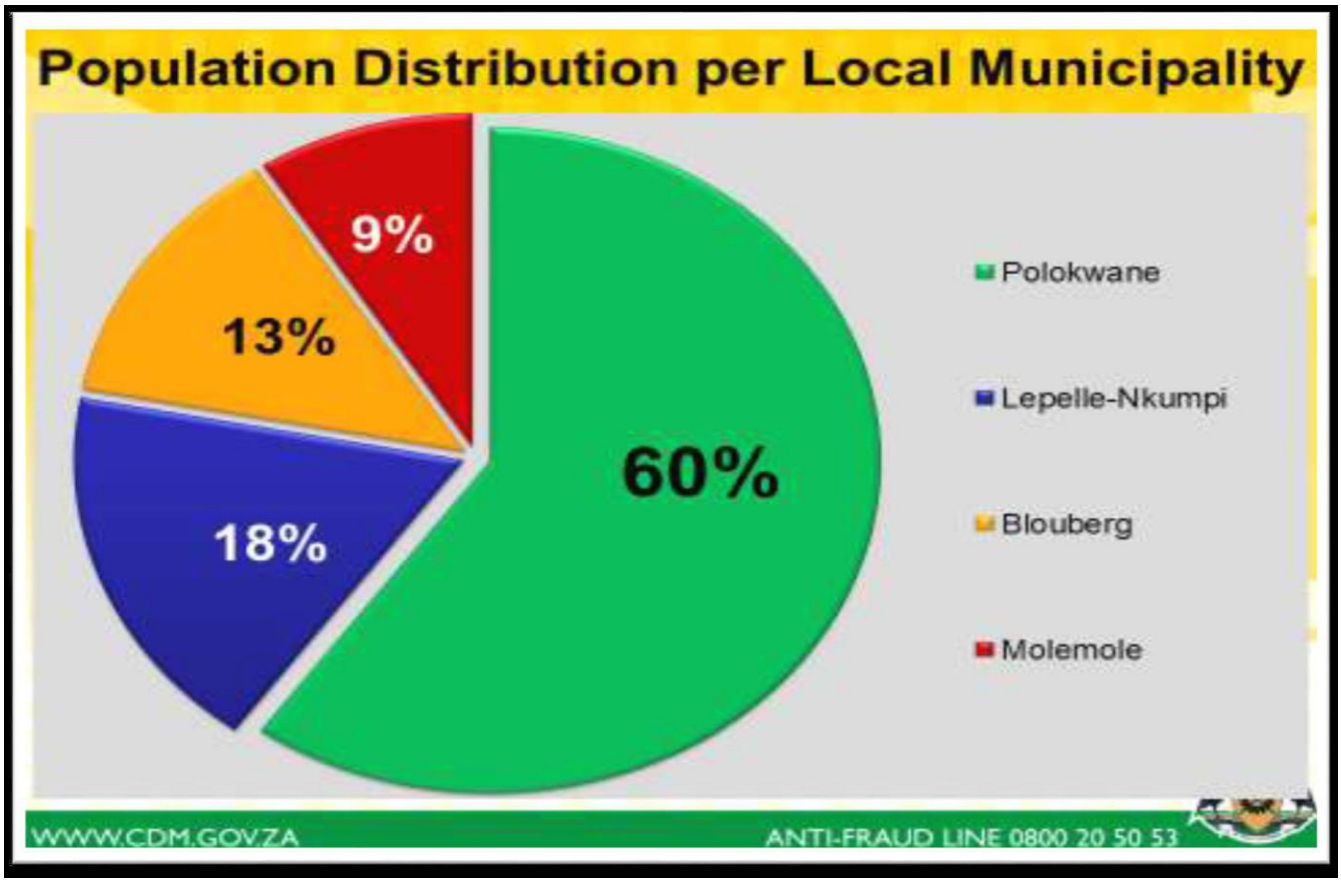


Figure 35: Population distribution per municipality in the Capricorn District

The population of Blouberg declined from 182 003 in 2000 to 176 135, before declining further to 172 601 in 2016. Of the four constituent municipalities of Capricorn District, Blouberg is the only municipality that saw a decline in its population. The amalgamation with Aganang led to an increase in the population starting from 2015 onwards (by 1.2%), but still far lesser than the population of Blouberg alone in 2000. This decline can be attributed to among other things, the low fertility rate,

high mortality rate compared to birth rate or the out migration by the economically active population to the industrial centers such as Polokwane and Gauteng to seek better economic prospects.

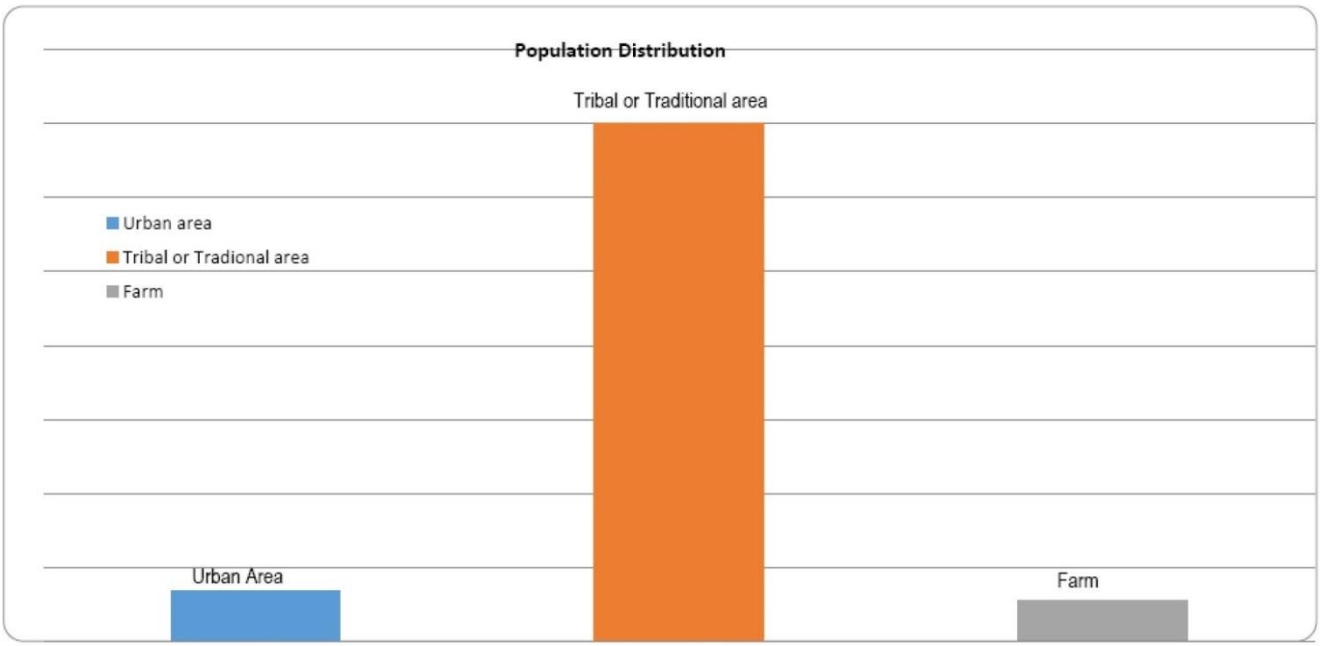


Figure 36: Blouberg population growth (2000-2016)

According to Stats SA, the municipality has five national groupings that reside within its area of jurisdiction and they are Black Africans, Colored, Indians and Whites. The majority is Black Africans who constitute 99% of the total population and live in the tribal areas. The female gender is dominant and the majority is youth.

- ***Statistical information and profiling***

Table 0-2: The growth patterns in terms of the population and households in the municipality between years 2001 to 2016

ITEM	(CENSUS 2011 STATS)	2007 (COMMUNITY SURVEY)	(CENSUS 2016STATS)	COMMUNITY SURVEY 2016
Population	171 721	194 119	162 629	172 601
Households	33 468	35 595	41 192	43 747
Average households	1.7	1.6	1.6	1.6
Wards	16	18	21	22
Villages	116	118	125	135

Table 1 above indicates the growth patterns in terms of the population and households in the municipality between years 2001 to 2016. The indication is that the population of the municipality has

not been consistent in terms of growth. The table shows a huge increase in the population by the year 2007 according to the survey. The households number has been increasing in every census and surveys conducted. According to the Municipality's 2021 IDP, the fluctuation may be caused by a variety of factors that includes migration and mortality. The increase in the number of wards is consistent with the decrease in the number of population.

v) Impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

The Construction Phase: This phase entails soil stripping of the overburden, construction of new infrastructure (PCDs, associated water and waste management infrastructure, as well as the processing plant).

The Operational Phase: relates to the operation of the PCDs, Water Treatment Plant, Sewage Treatment Plant and Processing Plant. This phase also includes concurrent backfilling of mined out areas.

The Decommissioning Phase: The decommissioning of the mining area and mining associated infrastructure (such as the plant and workshop area). The Post-closure Phase will commence once the mine has obtained Closure under the applicable legislation. Potential impacts identified for the project include but not limited to the following:

- Air Quality,
- Climate
- Topography
- Soil
- Fauna and Flora
- Surface Water & Ground Water
- Noise
- Visual
- Site of Archeological and Heritage significance
- Geology
- Traffic
- Inward Migration
- Economic Impact

This section provides a list of potential impacts on environmental aspects separately in respect of each of the main project actions / activities and processes. The potential impacts are presented for each of the project phases in tabular format.

Table 0-3: List of identified potential impacts on environmental aspects

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Significance Without Mitigation						Significance With Mitigation						MITIGATION TYPE
			Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance rating	Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance after Mitigation	
Construction Phase															
Site clearing, removal of topsoil and vegetation	Air Quality	Variable Dust generation from as land clearing, topsoil removal, loading of material, hauling, grading,	3	2	4	1	3	28	3	2	4	1	2.0	18	• Topsoil should not be removed during windy months (August, September and October) due to associated wind erosion

		stockpiling, bulldozing and compaction													heightening dust levels in the atmosphere. • The area of disturbance must be kept to a minimum and no unnecessary clearing of vegetation must occur. • Topsoil should be re-vegetated to reduce the exposure areas. • During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised. • Water or other binding agents such as (petroleum emulsions, polymers and adhesives) can be used for dust suppression on earth roads. • When using bulldozers and graders, there is need to minimise travel speed and distance and volume of traffic on the roads. •It should be noted that

																emissions generated by wind are also dependent on the frequency of disturbance of the erodible surface and therefore covering the stockpiles with vegetation would reduce the negative erosion effect. • Any crusting of the surface binds the erodible material. • All stockpiles should be damped down, especially during dry weather or re-vegetated (hydro seeding is a good option for slope re-vegetation). • Limit the areas and time of exposure of pre-strip clearing in advance of mining development In cases where the mitigation measures cannot be implemented dust suppression will be used.
Construction of surface infrastructure (such as. access roads, pipes, storm	Air Quality	Activities of vehicles on access roads, levelling and compacting of surfaces, as	2	2	4	1	3	28	2	2	4	1	2.0	18	• Dust emitted during bulldozing activities can be reduced by increasing soil

water diversion berms, change houses, admin blocks, drilling, blasting)		well localised drilling and blasting will have implications on ambient air quality. The above-mentioned activities will result in fugitive dust emissions containing TSP (total suspended particulate, giving rise to nuisance impacts as fallout dust) Bulldozing, excavation, drilling and blasting operations will result in the emission of dust to atmosphere													dampness by watering the material being removed thus increasing the moisture content. • Another option would be to time the blasting with wind to ensure the dust will not be blown to the sensitive receptors. • Materials need to be removed to dedicated stockpiles to be used during rehabilitation. • The hauling of materials should take place on roads which are being watered and/or sprayed with regularly. • To reduce the amount of dust being blown from the activity. • Limit the areas and time of exposure of pre-strip clearing in advance of construction to limit exposed soil surfaces.

General vehicle movement on site	Air Quality	Transportation of the workers and materials in and out of mine site will be a constant feature during the construction phase. This will however result in the production of fugitive dust (containing TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads Dust emissions from haul track.	1	1	1	4	2	14	1	1	1	4	4	6	• Hauling of materials and transportation of people should take place on roads which is being watered to reduce dust. • To reduce the amount of dust being blown from the load bin in the haul roads, the material being transported can be watered. • A speed limit of 30km must be adhered to on site. • Management should fit roads with speed humps to ensure adherence. • The drop heights should be minimised when depositing materials to the ground. • Encourage maximum permissible loading to reduce frequency of trips on trucks.
Removal of overburden, mineral extraction and	Air Quality	Drilling is an intermittent exercise that emits fugitive dust. There will be fumes	3	2	2	4	3	33	3	2	2	4	2	7	• Use of pre-blast environmental checklists, real-time weather monitoring

backfilling when possible		from diesel trucks transporting ore to the stockpiles and conveyor belts at crushing and screening facilities. The conveyor belts deposit the minerals into the crusher, the crushing process releases fugitive dust. Activities by machinery in the mining process will lead to exhaust fumes from vehicles and dust from drilling and blasting processes. Fugitive dust (containing TSP, as well as PM10 and PM2.5) occurs as a result of the aforementioned processes.														data and stringent controls on blasts carried out in sensitive areas • A no-blast arc is automatically calculated for the nearest Farmers based on the latest relevant weather conditions, including wind speed and direction, temperature inversions and amount of atmospheric turbulence • Respiratory protection should only be used to control the dust exposures where other dust collection or suppression systems have not been able to reduce the dust to acceptable levels. • When using hand held rock drills efforts should be made to control dust at source e.g. water injection or extraction. If control of dust at source is not practicable then respiratory protection should

															be used. • Low or in-pit dumping of overburden during high wind conditions • Use of efficient diesel fuel for heavy machinery. • Successful trialling of broad temporary rehabilitation of unshaped overburden emplacement areas by aerial sowing of a cover crop, providing an established vegetative stabilisation to minimise the potential for windblown dust generation • limit the areas and time of exposure of pre-strip clearing in advance of mining development

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Significance Without Mitigation						Significance With Mitigation						MITIGATION TYPE
			Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance rating	Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance after Mitigation	
Operational Phase															
Removal of overburden, mineral extraction and backfilling when possible	Air Quality	Drilling releases dust particles. There will be fumes from diesel trucks transporting ore to the stockpiles and conveyor	3	1	4	5	4	52	3	1	4	5	0.6	3.1	Formulation and implementation of sound management plans for all operations likely to create dust

		belts at crushing and screening													
Use and Maintenance of haul roads (incl. transportation of minerals to plant	Air Quality	Transportation of the workers and materials in and out of mine site will be a constant feature during the operational phase and result in the production of fugitive dustcontaining TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads. Substantial secondary emissions may be emitted from material moved out from the site during grading and deposited adjacent to road)	3	3	4	4	3	42	3	3	4	4	17	0.4	Formulation and implementation of sound management plans for all operations likely to create dust • Planting plenty of trees or hedges as shelterbelts to eliminate or minimise wind disturbance • Planning operations to maximise the benefit of wind breaks • Disturbed areas such as those caused by stripping off grass and topsoil should be kept to a minimum • Haul roads and standing areas should be sealed or concreted where possible • Use water sprays/carts to settle dust. Care must be

															taken to ensure that the water used is free from pollution by noxious matter. There are additives available that reduce the volume of water used, and increase its effectiveness, but approval to use them should be obtained from the local territorial authority. • Use of a global positioning system as a tool to track the locations of mining and dust suppression equipment (e.g. water carts) and cross-referencing this information with real- time weather monitoring to assist with dust control • Use of water sprays at each contact or transfer point along the conveyance system which have adjustable rates of application (low, medium and

															high) depending on dust levels • Automatic water sprays installed at the ROM hopper bin that produce a fine mist to suppress dust generated with the triggering of sensors when a truck enters the dump zone and automatic sprays activated until a set time following the departure of the truck • Use of a reclaim tunnel at the product stockpile and an enclosed conveyor to transfer minerals to the loader, both of which minimise dust generation • Use of a retractable telescopic chute with curtains to load minerals into transport trucks • Speed restrictions should

															be imposed and enforced • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust • Engine cooling fans of vehicles should be shrouded so that they do not raise dust
Fuel storage and Vehicle Movement Use and maintenance of haul roads (incl. Transportation of minerals to plant	Ground Water quantity	Fuel and Hydrocarbon leakages and spillages from the transporting vehicles may cause groundwater contamination	2	2	4	1	3	30	2	2	4	2	18	2.0	All storage areas containing hazardous material will have secondary containments of containers the volumes of the largest tank or container plus 10%. Resort to immediate clean up after accidental spillage. Divert runoff from haul roads that may contain hydrocarbons into lined pollution control dams
Generation of stockpiles and associated mining waste	Air	Dust generated from waste rock, evaporation of hydrocarbon fuels from storage tanks and spillages, waste oils chemicals plus	3	2	4	4	4	50	3	2	4	3	30	0.5	Automatic sprays installed around the perimeter of the ROM stockpile activated when the wind speed is >6 m/sec (averaged over 15 minutes)

		hazardous waste												• Finished product stockpiles formed on an as-needs basis with stockpiled minerals loaded out by truck as soon as possible • Topsoil handling and storage procedures including stockpile inventory, vegetative cover and signage to optimise rehabilitation and minimise wind erosion • Successful trialling of a water dust suppressant on haul roads resulting in a considerable reduction in the amount of water used for dust suppression on haul roads • Dust from stockpile sources can be contained in an enclosure, the use of plastic or other material cover, compaction of the surface and the use of water or sprays, trees and careful

															citing of stockpiles • In summary, care and planning of sites for plant, haul roads and stockpiles will help in reducing problems with nuisance dust. For existing plants, care must be taken to ensure the dust suppression system used fits in with the products produced and is easily used and maintained • There is a need to develop a waste management plan. • This will identify anticipated (liquid and solid) waste streams and will ensure thorough inspection and waste minimisation procedures, storage locations, and waste.
Beneficiation by means of crushing and screening	Air	The crushing process releases fugitive dust, especially if there are no enclosure and water	5	1	4	5	5	70	5	1	4	4	30	0.4	This is particularly suitable for use on the output chute or stone box under the crusher • Where practicable, stone

		sprays. Dust contained within the ROM ore can be released into the atmosphere during this process i.e. fugitive dust (containing TSP, as well as PM10 and PM2.5). Wind erosion from stockpiles can be a perennial source of dust if not properly managed during and post mining operations.													boxes on process plants can direct and slow the fall of material onto conveyor belts, and thus the amount of dust generated at transfer points • Crushing often requires constant supervision; therefore, some extra operator protection at this typically dusty process is almost always required • In order to reduce dust contamination in crusher control rooms and operator's positions, these areas should be completely enclosed and ventilated with uncontaminated air to create a positive air pressure • Thus it may be necessary to provide air conditioning so the operator has no need to open doors or windows • Protection of the control room will, in addition to creating a healthier

															environment, protect the electrical equipment from dust contamination that may lead to malfunctioning. **Screening** • In order to control dust in dry screening, the conventional method is to place a hood over the total screen area with rubber curtains sealing to the screen sides • To be effective the screens and discharge chutes should be sealed to the bins to prevent currents of air carrying fine dust away into the surrounding area, and the screen house building must be well sealed or dust will escape • Desirable elements for effective control are enclosed screens; enclosed transfer points, covered conveyors and chutes, and sealed bins.

															In theory it is then only necessary to deal with dust-laden air in the controlled area. • Ducting from each plant item and transfer point may be connected to a filter system. Each item can either have its own filter or be ducted through to a central collector, usually a cyclone or bag filter system, or an electrostatic precipitator. The electrostatic precipitator is very efficient, but is an expensive item to buy. • Metal sheeting or rubber panels normally achieve the enclosure of equipment, plus rubber seals at the joints. The use of rubber sheeting panels has grown recently, as it is easily removed and replaced for maintenance purposes.

Open Pit Mining	Ground Water	Open pit mining below the water table will result in pit inflows	2	2	4	4	4	64	2	2	4	4	64	4.0	Pit inflows cannot be mitigated. Provision needs to be made within the mine water balance for the reuse or treatment of pit inflows. In case the water should be discharged, treatment will be required before discharge. This will also require constant pumping and will pumping will be increased in rainy seasons.
Open Pit Mining	Ground Water Quantity	Mine dewatering and groundwater abstraction for water supply purposed could reduce groundwater levels in the area	3	3	4	4	4	80	3	3	4	4	56	4.0	No streams in the project area are present No stream will be affected by the mining activities Pit dewatering will cause a cone of drawdown which will affect the neighbouring farms in all directions of the project site. The extent of the zone of influence will not extend beyond 1000m and the maximum drawdown in the affect areas will range between from 5m in the first

															year to 58m in year 20. Possible mitigation
Open Pit Mining	Ground Water Quantity	Increased potential for groundwater contamination due to seepages from the overburden stockpiles	1	1	2	2	2	16	1	1	2	2	16	2.0	Compact footprint area of the overburden stockpiles to minimise ground water infiltration. Stormwater run-off from the overburden stockpiles will be diverted into dirty water dams. A groundwater resource monitoring program will be implemented during to detect the groundwater contamination. This will be studied more during the WUL process
Site clearing, removal of topsoil and vegetation	Surface Water	Increased sediment loads from vegetation clearance and soil compaction	1	1	2	4	2	16	1	1	2	4	10	2.0	
Stockpiles and general waste	Surface Water	Pollution of Watercourses from general waster	2	2	2	3	3	27	2	2	2	3	14	2.0	
Vehicles and truck	Surface Water	Increased runoff due to	3	3	3	3	4	48	3	3	3	3	1	2.0	

movement of haulage vehicles and passenger vehicles as well as conveyor belts		soil compaction and increased paved surfaces											4		
Open Pit mining	Vegetation	Clearing of vegetation within the site will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of plant communities. The removal of vegetation will also expose soil increasing the risk of erosion	10	5	5	5	5	90	6	5	5	4	64		

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Significance Without Mitigation						Significance With Mitigation						MITIGATION TYPE
			Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance rating	Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance after Mitigation	
Closure and Decommission Phase															
Demolition & Removal of all infrastructure (incl. transportation off site)	Air Quality	The process Includes dismantling and demolition of existing infrastructure, transporting and handling of topsoil on unpaved roads in order to bring the site to its Initial/rehabilitated state. Demolition and removal of all infrastructures will cause fugitive dust emissions.	5	2	2	4	3	39	5	2	2	4	0.6	23	• Demolition should not be performed during windy periods (as dust levels and the area affected by dust fallout will increase, should it be performed then, regular dust suppression methods should be used • Speed restrictions should be imposed and enforced.

																• Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Dust suppression of roads being used during rehabilitation should be enforced.
Rehabilitation (spreading of soil, vegetation & profiling)	Air Quality	Topsoil can be imported to Re-construct the soil structure. There is less transfer of soil from one area to other therefore negligible chances of dust through wind erosion. Profiling of dumps and waste rock dump to enhance vegetation cover and reduce wind erosion from such surfaces post mining.	1	2	2	4	2	18	1	2	2	4	0.2	7	Re-vegetation of exposed areas for long-term dust and water erosion control is commonly used and is the most cost-effective option. • Plants with roots that bind the soil, and vegetation cover should be used that breaks the impact of falling raindrops, thus preventing wind and water erosion. • Plants used for re-vegetation should be indigenous to the area, hardy, fast-growing, nitrogen-fixing, provide high plant cover, be adapted to growing

															on exposed and disturbed soil (pioneer plants) and should easily be propagated by seed or cuttings. • The area of disturbance must be kept to a minimum. • Spreading of soil must be performed on less windy days or with spraying of water • The bare soil will be prone to erosion and therefore there is need to reduce the velocity near the surface of the soil by re-vegetation. • Leaving the surface of the soil in a coarse condition reduces wind erosion and ultimately reduces the dust levels. • Additional mitigation measures include keeping the soil moist using sprays or water tanks, using wind breaks.

															• The best time to re-vegetate the area must be linked to the distribution and reliability of the rainfall to minimize water usage. • Speed restrictions should be kept to a minimal. • Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust. • Dust suppression of roads being used during rehabilitation should be enforced. • It is recommended that the rehabilitation by vegetating should begin during the operational phase already as the objective is to minimise the erosion.

																• These measures should be aimed to reduce the potential for fugitive dust generation and render the impacts on ambient air quality negligible.
Rehabilitation: Covering of open pit with capping layer and top soil	Baseline Noise Levels	Increased noise levels on the proposed Site	1	2	2	5	5	50	5	3	3	1	1.0	12	
Care and Maintenance	Environment	Reduced impact on the environment	1	1	2	5	2	15	2	2	1	3	1.0	10	
Rehabilitation of open pits and removal of infrastructure	Groundwater quality	silt load contribution towards													The dominant direction of migration of contaminants from the surface facilities will be towards the pits.
Open pit backfill	Groundwater	aquifer contamination caused by backfill													Pollution plume migration will be towards the mine pits around the stockpiles areas and the plume will not affect the nearby farms. The final backfilled open cast topography should be designed in such that runoff is diverted away from the open cast area.

Open pit backfill	Groundwater	Rebound water levels within backfill material may cause decant														Decant positions are located within the mining area. In case there is decant an impermeable layer can be applied below the topsoil cover which will need to be compacted to prevent the ingress of water. Install water monitoring boreholes closer to the decant points to monitor the water level and quality

Construction Phase																
Construction for site establishment and mining infrastructure	Wetlands	Negative impact on flora and fauna from human interference on site														Use of techniques to minimise any form of noise pollution during construction should be exercised. Machinery used during the construction phase should be one such that it does not emit a high amount of chemicals that may deteriorate the wetlands.
Land clearing	Wetlands	Biodiversity loss														Avoid stockpiling of removed soils on wetlands. The creation of artificial pan wetland on a different location within the farm is encouraged. The creation of artificial will promote habitat life within the farm instead of total destruction.
Land clearing	Wetlands															Construct low level water deflection berms, reduce clearing to a minimum to maintain vegetation cover. Avoid stockpiling of removed soils on wetlands as this will

																promote erosion of soil into wetlands and further deteriorating the wetlands.
Oil spillages	Wetlands	Water quality contamination														During the operational phase, the use of a detailed EMP should be encouraged. Storm water management Measures should be followed. Sedimentation trapping methods should also be in place do reduce the creation of gully formation.
Human dispersal of alien seeds/sapling by construction vehicles, shoes, clothes	Wetlands	Alien invasion of native species habitat														A list of all possible alien vegetation that is probable to occur within site and as a result of mining activities within wetlands should be compiled and eradicated as soon as they occur.
Increased excavation processes that may lead to more sediment being deposited into the wetlands	Wetlands	Gully formations														During the operational phase, the use of a detailed EMP should be encouraged. Storm water management measures should be followed. Sedimentation trapping methods should also

															be in place do reduce the creation of gully formation.
Continued mining activities	Wetlands	Water quality may be reduced by increased sedimentation and erosion													Mining activities should be within the mentioned buffer away from the wetlands. Introduce stormwater management measures as part of EMP
Continued mining activities	Wetlands	Interruption of wetland habitat with potential decrease in species numbers and local biodiversity													Possible fencing off of the study area from the rest of the game farm will reduce the loss of biodiversity. Existing habitat features should be incorporated into site design and protected from change
Toxic chemicals from vehicles and mining machinery (oil, petrol, brake fluid etc.)	Wetlands	Pollution of wetland and habitat which could ultimately lead to underground water contamination													Servicing and refuelling of vehicles should take place outside of the mining area; Drip trays should be used to collect waste oil and other lubricants; Any effluents or waste containing oil, grease or other industrial substances

																must be collected in a suitable container and removed from the sites. Oil spills that may occur should be removed as soon as possible and the contaminated top soil disposed using proper procedures put in place
Human dispersal of alien seeds/sapling by vehicles, shoes, clothes	Wetlands	Alien invasion of native species habitant														Alien species (including their seedlings and saplings) identified within the prospecting sites should be removed (manually preferably) to prevent their spreading; Alien species removal programme must be developed and implemented
Construction, operational And decommissioning Phase																
Site clearing, removal o topsoil and vegetation	Surface Water	Increased sediment loads from vegetation clearance and soil compaction														• Progressive rehabilitation of disturbed land should be carried out to minimize the amount of time that bare soils are exposed to the erosive effects of rain and

															subsequent runoff; • Implementation of the proposed basic storm water management plan is recommended at the mine site to channel and contain storm runoff; • Traffic and movement over stabilised areas should be controlled (minimised and kept to designated paths), and damage to stabilised areas should be repaired timeously and maintained; and • The total footprint area to be cleared for the development of mine infrastructure should be kept to a minimum by demarcating the construction areas and restricting removal of vegetation to the footprint Surface Water Surface Water areas only.

Site clearing, removal of topsoil and vegetation	Surface Water	Increased sediment loads from vegetation clearance and soil compaction														• Progressive rehabilitation of disturbed land should be carried out to minimize the amount of time that bare soils are exposed to the erosive effects of rain and subsequent runoff; • Implementation of the proposed basic storm water management plan is recommended at the mine site to channel and contain storm runoff; •Traffic and movement over stabilised areas should be controlled (minimised and kept to designated paths), and damage to stabilised areas should be repaired timeously and maintained; and • The total footprint area to be cleared for the development of mine infrastructure should be kept to a minimum by

																demarcating the construction areas and restricting removal of vegetation to the footprint areas only.
Fuel storage and Vehicular Movement Use and maintenance of haul roads (incl. transportation of minerals to plant	Surface Water	Water resources pollution due to spillage of oils, fuel and chemicals														• Oil recovered from any vehicle or machinery on site should be collected, stored and disposed of by accredited vendors for recycling.
Stockpiles and general	Surface Water	Pollution of watercourses from general waste and sewage effluent													.	• A reticulated sewage disposal facility at the proposed mine site should mitigate potential water quality issues that may arise due to population increase; • General waste should be collected and disposed of adequately; and • A water quality monitoring plan needs to be produced and implemented to determine any changes in the water quality.

Vehicular movement of haulage vehicles and passenger vehicles as well as conveyor belts	Surface Water	Increased runoff due to soil compaction and increased paved surfaces														• Progressive rehabilitation of disturbed land should be carried out to minimize the compacted surfaces at the decommissioned mine.
Vehicular movement of haulage vehicles ,passenger vehicles, workshops	Surface Water	Contamination from leakage and spillage of chemicals, oils and grease														• Oil recovered from any vehicle or machinery on site should be collected, stored and disposed of by accredited vendors for recycling.

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	Significance Without Mitigation						Significance With Mitigation						MITIGATION TYPE
			Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance rating	Intensity	Extent	Duration	Probability	Weighing Factor Significance Rating	Significance after Mitigation	
Construction Phase															
Rehabilitation of stockpile areas, PCD's and discard dump	Surface Water	Acid mine drainage problems and problems associated with general waste disposal													• Implement phytoremediation measures to correct contamination of water resources. Employ new technologies which are

																recently being developed to treat acid mine drainage to usable water quality levels.
Stripping, handling and placement of soil associated with pre-construction land clearing and rehabilitation	Soil	Loss of topsoil														It is recommended that all usable soil is stripped and replaced after final removal of the mining infrastructure. The soils are overall fairly shallow 30-120cm on Glenrosa and Mispah soils. • During the construction phase it is recommended that the topsoil be stripped and stockpiled in advance of construction activities that might contaminate the soil. Due to the shallow nature of the soils it is recommended to strip only 40-60cm of the soil. These estimates take into consideration a possible 10% topsoil loss through compaction and allow the rehabilitated areas to be returned to the pre-mining land capability, i.e. wildlife

																and gaming. • The stripped soils should be stockpiled upslope of areas of disturbance or mining development to prevent contamination of stockpiled soils by dirty runoff or seepage. Topsoil stripped should also be protected by a bund wall to prevent erosion of stockpiled material and deflect water runoff. • Care should be taken that stockpiles do not to block too many drainage lines to prevent erosion due to intense high rainfalls that often occur in the region • Any soil that might possibly be contaminated during the construction phase should be stripped and stockpiled in advance of construction activities.
Stockpiling of topsoil	Soil	Loss of topsoil through														• Stockpiles can be used as a

		erosion. Mixing of deep and surface soils during handling, stockpiling and subsequent placement. Change to soil's physical, chemical and biological properties due to operational contamination of oils and Iron dust														barrier to screen operational activities. If stockpiles are used as screens, the same preventative measures described above should be implemented to prevent loss or contamination of soil. • The stockpiles should not exceed a maximum height of 6m and it is recommended that the side slopes and surface areas be vegetated in order to prevent water and wind erosion and to keep the soils biologically active. • If used to screen mining operations, the surface of the stockpile should not be used as roadway as this will result in excessive soil compaction
Backfilling and profiling	Soil	Change in natural surface topography due to re-profiling of surface after stripping														Loss of topsoil and usable soil; Strip all usable soil and stockpile; Vegetate long-term soil stockpiles • Contamination of topsoil

															and stockpiled soil; Prevent contamination of topsoil and stockpiled soil; Site all soil stockpiles upslope from any mining / development activities • Position stockpiles upslope of mining areas, or as screens to restrict visibility of the mining operation provided that in doing so, the stockpile is not exposed to the risk of seepage or dirty water contamination. • Erosion of stockpiled soil • Ensure that all stockpiles have a storm water diversion berm for protection against erosion and contamination by dirty water.

Vegetation clearing for open pit excavation, clearing for construction of buildings, roads and other infrastructure, waste dumps etc.	Vegetation	The area for the proposed development will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of plant communities. The removal of vegetation will also expose soil increasing the risk of erosion													• Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact. The vegetation within this 100 m floodline must remain undisturbed and natural. • Control all waste dumping and avoid pollution of natural vegetation • Avoid planting of exotic plant species
Vegetation clearing for open pit excavation clearing for construction of buildings, roads and other infrastructure, waste dumps etc.	Vegetation	The area for the proposed development will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of plant communities. The removal of vegetation will also													• Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact. • The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m from within

		expose soil increasing the risk of erosion														this 100 m floodline must remain undisturbed and natural. • Control all waste dumping and avoid pollution of natural vegetation • Conserve the hill that occurs on the southern boundary of Baden. The stormwater management plan should be designed with the conservation of the hill as a priority. • Avoid planting of exotic plant species
Alien Invasive plant species on cleared areas (Construction)	Vegetation	Alien invasive plant species will encroach into disturbed areas. It is expected that extensive area will be disturbed, natural vegetation totally destroyed.														• Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact. • The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m
Open Pit mining	Vegetation	The area for the proposed development will be cleared														

		of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of plant communities. The removal of vegetation will also expose soil increasing the risk of erosion														. The vegetation within this 100 m floodline must remain undisturbed and natural. • Control all waste dumping and avoid pollution of natural vegetation, • Conserve the hill that occurs on the southern boundary of Baden. The stormwater management plan should be designed with the conservation of the hill as a priority. • Avoid planting of exotic plant species
Alien Invasive plant species on cleared areas (Haulage vehicles and human activities)	Vegetation	Alien invasive plant species will encroach into disturbed areas. It is expected that extensive area will be disturbed, natural vegetation totally destroyed.														• On-going alien plant control must be undertaken; • Areas which have been disturbed will be quickly colonised by invasive alien species. An on-going management plan must be implemented for the clearing/eradication of alien

																species. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. • Avoid planting of exotic plant species in public areas or home gardens, use indigenous species.
Change in land use (site clearing)	mammal and herpetofauna	Total or near-total irreplaceable loss of mammal and herpetofaunal species is anticipated														• The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m The vegetation within this 100 m must remain undisturbed and natural. • Control al waste dumping and avoid pollution of natural Vegetation, · Conserve the hill that occurs on the southern boundary of Baden.
Change in land use (site clearing)	mammal and herpetofaunal Habitat	The mining operation will replace the current land-use practice which relies on														Mitigating the impacts is impossible, although higher authorities may enforce

		prime natural resources and will thus be destructive to natural habitats through vegetation clearing .Opencast mining is responsible for continued loss of faunal habitat. This has widespread impact on ecological function and health of sensitive ecosystems...Displacement of extraordinary high vertebrate species richness														statutory preconditions for five Red Listed trees and waterways, such as buffer zones. Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact. • The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m from the outer. The vegetation within this 100 m must remain undisturbed and natural. • Control al waste dumping and avoid pollution · Conserve the hill that occurs on the southern boundary of Baden.
Change in land use (site clearing)	Loss of avian habitats	Avian habitats, including Mopane woodland, scrub and open areas will be destroyed by the proposed mine. From the Nakedi														• Areas cleared for mining operations must be minimised. However, the scale of the proposed mining operation is

		Solutions layout plan that was provided, it appears that at the very least 50-70 % of the ~7,000 Ha of natural vegetation will be destroyed for the open cast pits, dumps, stockpiles, plants and other infrastructure, although it remains unclear how much (if any) natural vegetation will remain. This will represent a significant loss of habitat in a region of high conservation significance, and will affect a number of red-listed species, including several raptors.														such that irreversible environmental damage will occur even if this mitigation measure is implemented. Cumulative impacts: A large area of avian habitat has already been lost in this area because of the nearby The impacts of habitat loss are particularly severe for large raptors like Martial Eagle that require large areas of intact habitat. · A specialist must be engaged to check the entire property for active nests of red-listed species, such as White-back Vulture, Martial Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to ensure that breeding birds are not disturbed
Change in land use (open cast mining areas)	Loss of avian habitats.	Avian habitats, including Mopane woodland, scrub														• Areas cleared for mining operations must be

		and open areas will be destroyed by the proposed mine.														minimised. However, the scale of the proposed mining operation is such that irreversible environmental damage will occur even if this mitigation measure is implemented. Cumulative impacts: A large area of avian habitat has already been lost in this area because of the nearby . The impacts of habitat loss are particularly severe for large raptors like Martial Eagle that require large areas of intact habitat. · A specialist must be engaged to check the entire property for active nests of red-listed species, such as White-back Vulture, Martial Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to ensure that breeding birds are not disturbed.

Change in land use (open cast mining areas)	mammal and herpetofaunal	Total or near-total irreplaceable loss of mammal and herpetofaunal species is anticipated														Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact. • The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m. The vegetation within this 100 m must remain undisturbed and natural. · Conserve the hill that occurs on the southern boundary of Baden.
Human activities	Faunal species	In addition to direct habitat loss, the disturbance of birds and other vertebrate fauna species in the surrounding areas will increase. This impact will be manifested both directly (e.g., increased poaching pressure and disturbance of nests) and indirectly (changes in prey availability, nesting														· Measures must be put in place to ensure that no illegal hunting of birds takes place on the mine property or in surrounding areas. · A specialist must be engaged to check the entire property for active nests of red-listed species, such as White-back Vulture, Martial

		material, etc.). Given the limited background information available, the impact assessment here pertains to the worst case scenario.														Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to ensure that breeding birds are not disturbed
Human activities	Fauna	In addition to direct habitat loss, the disturbance of birds and other vertebrate fauna species in the surrounding areas will increase. This impact will be manifested both directly (e.g., increased poaching pressure and disturbance of nests) and indirectly (changes in prey availability, nesting material, etc.). Given the limited background information available, the impact assessment here pertains to the worst case scenario.														· Measures must be put in place to ensure that no illegal hunting of birds takes place on the mine property or in surrounding areas. · A specialist must be engaged to check the entire property for active nests of red-listed species, such as White-back Vulture, Martial Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to ensure that breeding birds are not disturbed.
Mining processing activities	Ground and surface water	Pollution generated by the mine (e.g., acid mine														Implement a rigorous pollution prevention program

	pollution.	drainage, accidental fuel spillages, as well as pollutants such as mercury and lead) and provision for water treatment is being made only towards the end of life of the mine (i.e., ~30 years after the start of mining).														as part of a comprehensive environmental management plan (EMP) and ensure that no pollution whatsoever enters local ground or surface water. This aspect of the EMP requires specialist input, and must reflect the pristine nature of downstream habitats, and the fact that the Limpopo River runs through a conservation area of global significance.
Air pollution from blasting wind erosions and vehicle movement	Vegetation	The anticipated increase in haul traffic and opencast mining operations will lead to an increased settling of dust on adjacent vegetation. Continued increased levels of dust in the air have an effect on faunal species, particularly birds, but also on fauna species feeding on the vegetation.														Implement a rigorous dust suppression program to minimize air pollution, particularly windborne particles produced by the mining process, stockpiles and discards dumps. This program should include (but not be limited to) the following measures: a) Shield stockpiles from

Air pollution excavations and construction	Vegetation	The anticipated increase in haul traffic and opencast mining operations will lead to an increased settling of dust on adjacent vegetation. Continued, increased levels of dust in the air have an effect on faunal species, particularly birds, but also on fauna species feeding on the vegetation.														predominant wind directions; b) vegetate areas and ensure continual capping and vegetation of the sides of mine residue facilities; c) regular spraying; d) continuously remove iron form site and reduce long-term stockpiling; e) clear Iron spillages from site
Clearing of vegetation and earthworks	Visual	Visual impacts are expected to result from the stripping of vegetation and earthworks associated with the preconstruction and construction phases of the proposed Nakedi Solutions Iron mine. The stripping of vegetation will result in the bare soil being exposed, creating a visual scar within the area, and a contrasting colours in the landscape														Erosion control measures must be put in place if vegetation is to be cleared. Where possible, all the natural vegetation around the iron mine should be retained, especially vegetation surrounding the perimeter and boundary areas with neighbouring farms.

Construction of offices, plant infrastructure, workshops and other associated mine infrastructure	Visual Resource	The process of construction equipment and related works in the construction of the plant and associated mining areas (e.g. storage areas, access roads) will introduce visually intrusive elements into the landscape and locally result in increased traffic. Although considered a temporary and intermittent impact the amount of large vehicles will increase as construction progress. The construction of the project plant and infrastructure will require removal of vegetation and alteration of the existing topography that will result in a change in the existing landscape character.														External signage should be kept to a minimum, were possibly shielding material should be utilised to fence of the construction

Earthworks and construction of plant infrastructure	Visual	Night-time lighting will be required during construction. Due to the level of screening provided by the existing vegetation cover the impact of light pollution is expected to be limited, but may increase as construction progresses and more cranes and large plant are housed on site. Where possible, all the natural vegetation around the iron mine should be retained, especially vegetation surrounding the perimeter and boundary areas with neighbouring farms. • During construction, selective lighting for the construction camps and other secured areas should be employed. Up-lighting of structures should be avoided														Where possible, all the natural vegetation around the Iron mine should be retained, especially vegetation surrounding the perimeter and boundary areas with neighbouring farms. • During construction, selective lighting for the construction camps and other secured areas should be employed. Up-lighting of structures should be avoided

Fugitive dust from construction and vehicle movement	Visual Resource	Fugitive dust														• Dust control measures must be implemented to reduce settling of dust on trees and buildings reducing the visual character of the area. • If clearing of vegetation or construction is to occur during the night, all lighting should be placed to ensure that excessive lighting does not escape the site; • When necessary, and particularly during the dry season, efficient watering of areas where construction activities result in dust creation and vehicular movements occur will should be used; and • There must be an enforcement of low vehicle speeds on site
Presence of topsoil, ROM, product and ,overburden stockpiles and discard dumps; processing plant and	Visual impact of physical structures	Operational Phase Reduction in visual resource value due to presence of physical														• Where possible, natural vegetation around the Nakedi Solutions Iron Mine should

other mining infrastructure		structures on site													be retained. • Progressive rehabilitation of the Iron mine should be undertaken. • Mine dumps and stock piles should not exceed 15m of height • Litter control measures should be kept in place to ensure that the site is maintained in a neat and tidy condition. • Employ 'smart architecture' on physical infrastructure to mimic natural elements and traditional building forms. • External signage should be kept to a minimum (with the exception of safety notifications). • Designated areas for material storage, waste sorting and temporary storage batching and other potentially intrusive activities

																will be created and screened off to the extent is feasible and • Where feasible trees must be transplanted to locations adjacent to the mine where they will not affected by mining activities.
Presence of topsoil, ROM, product and overburden stockpiles and discard dumps; processing plant and other mining infrastructure	Visual impact of fugitive dust	Operational Phase Reduction in visual resource value due to Fugitive dust														• Institute a rigorous planting regime along the project site boundaries to act as bio-filters. • Areas where vegetation has been cleared on site should have erosion control measures in place. • The planting of trees must be instituted along the entire access route to prevent dust plumes spreading onto farming activities neighbouring the gravel road. Progressive rehabilitation of the iron mine should be undertaken.

																• Dust control must be implemented by reducing and controlling dust through the use of approved dust suspension techniques as and when required. • Consider fitting drills with dust collection systems • All stockpiles of material that maybe blown away during windy spells (such as sand, soil, and excavated material etc.) will be suitably covered or other measures taken to prevent such occurrence. Suitable measures will be determined by the environmental control officer or site engineer based on the nature of the material, its use etc.
Mining infrastructure	Visual Impact of night time Illumination	Operational Phase Reduction in visual resource value due to														• Outdoor lighting must be strictly controlled so as to prevent light pollution.

		Night-time illumination													• All lighting must be installed at downward angles. • Consider the application of motion detectors to allow the application of lighting only where and when it is required. • The height of poles and masts determines how broadly the light is dispensed. If the lights are mounted at an appropriate height, they will provide maximum illumination while minimizing light pollution into the surrounding area. • providing lights with cover fittings that limit lateral and upwards light “spill”, and positioning lights to shine towards the intended areas of illumination rather than using floodlights • The use of outdoor fixtures high up on tall structures should be limited or avoided •

																Consider installing anti-reflective coating on metal surfaces to reduce the sunlight that is reflected and increase the amount of sunlight that is absorbed during daytime, to reduce the effect of glare and reflection of metal infrastructure
Demolition & Removal of all infrastructure	Visual Significance rating post closure	Reinstatement of visual resource value due to dismantling of infrastructure and subsequent rehabilitation of footprint areas. Permanent alteration of site topographical and visual character of mined areas														Dismantle and remove all visible surface infrastructure during decommissioning; • Re-shape all footprint areas to be as natural in appearance as possible; • Implement progressive rehabilitation during operations; • Shape and profile the final mining void to be free draining if possible and establish a vigorous and self-sustaining vegetation cover on the final rehabilitated

															landforms • Conduct on-going monitoring and maintenance of the rehabilitated areas to ensure that they establish Successfully and that erosion does not occur; • Continuously assess condition of vegetation cover of rehabilitated areas for adequate cover density and species composition. • Due to the unpredictable nature of vegetation growth the effectiveness of the re-vegetation will only become apparent after several years. Where specimens die, grow poorly or do not effect sufficient coverage the cause of the problem should be established and the afflicted specimens replaced, or a more suitable alternative established, based on a case-to-case basis; and

																• Employ control measures to eradicate weedy and alien invader plant species as required. A detailed post-closure land use plan be compiled for the mine, which will take into consideration all present and likely future land uses surrounding the site, to ensure that the site is successfully re-integrated into the existing visual fabric.
Site development and mining	Demographic change process	Influx of workers														• Optimise the use of local labour as far as possible. Establishing early on skills development programmes in the local area will support the possibility of finding skilled people locally; • Implementation of a Social and Labour Plan; • Develop a code of conduct with which contractors and their employees must

															comply. The code should deal with the interaction with local communities and substance abuse among other things; • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers must also be provided with identification tags. • Have clear rules and regulations for access to the mine area and immediate surrounds to control loitering. Consult with local SAPS to establish standard operating procedures for the control and removal of loiterers in the proximity of the site. • Develop skills transfer plans that would enable a worker to move from one

																project to another within the same area / region; • Develop a Stakeholder Engagement Plan (SEP) which clarifies the principles of engagement with community and other stakeholders, sets in place appropriate liaison forums (a community forum is recommended), and describes the grievance management procedure to be adopted by the Mine. Establishment of a local labour recruitment committee to monitor recruitment procedures and results; and • Communicate through media the recruitment procedures and priorities to discourage work seekers from outside the area.
Mine development	Socio-cultural change	Noise pollution														• Construction activities during the construction

	process														phase to take place during daytime only; • Biannual noise assessments during construction and operation along the boundaries of the proposed Site to take place to identify noise intrusions; • Using acoustic silencers on noisy equipment, All machinery and/or plant, which radiate noise levels exceeding 85.0dBA to be acoustically screened off; • All vehicles operational at the proposed site to conform with the following health and safety standards, Operational procedures such as speed limits on roads on site; • Selecting equipment with lower sound power levels; • Installing acoustic enclosures for machinery and/or parts causing radiating noise; • Conformance to the

																prevailing ambient noise level along the boundary of the proposed project area; • Plant and equipment design and selection, replacing older equipment with new technology that is often quieter; • House crushing plants within buildings, Enclosing conveyor systems; • Reducing impact noise by lining chutes with hard wearing rubber and polyurethane materials; • Using terrain to acoustically shield the operations, placing noisy equipment behind noise barriers; • Alternate safety systems on mobile equipment to replace reversing alarms and horns • Monitoring systems to reduce the impact of weather conditions and regular monitoring should also be implemented.

Mine development	Socio-cultural change process	Crime, Safety and Security														Fence off servitudes and access roads and provide for strict access control measures to service roads and patrol service roads regularly; • Utilize sufficient mine security to regularly patrol the fences of the mine infrastructure, especially; • Liaise with the South African Police Service to enhance police patrol activity in the project area; • Support the community watch of the directly affected and neighbouring landowners which can report criminal or suspicious activity; and • Employment of local people on the mine to improve the poverty levels in the host and neighbouring communities
Mine development	Socio-cultural change	Integration with local community														• Launch aggressive culturally appropriate STI and HIV/AIDS awareness

	process														campaigns; • Distribute condoms by placing them at centrally located points; • Enhance people's knowledge through awareness campaigns on site, schools and community forums; • Encouraging people to get tested; • Equipping HIV-positive youth with personal and professional skills, such as psychosocial care training to enable them to better manage their status, to be positive role models, and to enhance their potential for employment; • Control access to the construction site to prevent sex workers; as well as • Employ local women to decrease their financial vulnerability.

Mine development	Socio-cultural change process	Quality of life and sense of place														• Establishment of an anti-poaching unit available to adjacent land owners, and establishing a security forum in collaboration with these land owners. Land owners are to be actively involved in the selection of the contracting company employed to conduct anti-poaching in the area. Increased security measures (fencing, access control and monitoring) on mine premises; • Properly constructed and secured fences can control access to construction sites; • Implementing strict access control of the project site and the contractors workforce camp; • Code of Conduct to form part of induction of new workers with a clear statement

Mine development	Institutional and Empowerment Changes Processes	Attitude formation against project														. It would rather be associated with an appraisal by I&APs of the proposed project, change events and perceived impacts. If such appraisal about the objects of thought (being the project; changes processes or impacts), includes evaluative judgments - positive, negative or neutral, these are by definition, attitudes (in short, how we feel about things).
Mine development	Institutional and Empowerment Changes Processes	Negotiation process														A Community Liaison Officer should be appointed to assist with stakeholder engagement. • Negotiations to be approached with the necessary cultural sensitivity with the effort to negotiate in the language understood by all affected parties. • Intensive engagement between Nakedi Solutions

																and the municipality well in advance of construction and operation of the mine should be undertaken. The establishment of a forum whereby local government and other major mines and industries in the area should be promoted by both the mine and the local municipality in this context the responsibilities of local government should be well understood, and potential problems defined and addressed as early as possible
Mine development	Economic Change process	Direct formal employment opportunities to local individuals														Nakedi Solutions Mine intends to employ mostly local labourers during the construction phase of the proposed project, thus contributing to an economic impact in the area. Although job opportunities are viewed as positive impacts, it should be indicated that many job

																opportunities will be created during construction phase of the project thus providing economic relief to local community during this phase of the project. In addition to the employment opportunities, there is also potential skills transfer which will have a lasting impact on the community
Mine development	Economic Change process	Indirect formal and /or informal employment opportunities to local individuals														Unskilled job opportunities should be awarded to the people from local neighbouring areas; • Equal opportunities for employment should be created to ensure that the local female and youth population also have access to these opportunities; • Individuals with the potential to develop their skills should be afforded training opportunities. • Mechanisms should be

															developed to provide alternative solutions for creating job security upon completion of the project; • Payment should comply with all applicable Labour legislation in terms of minimum wages and conditions of employment. • Where local labourers are employed on a more permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn (PAYE) or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' positions on the mine itself have become redundant or once the mine has come to the end of its construction phase comes to

																an end.
Mine development	Economic Change process	Impact on existing businesses in surrounding areas														Devise a compensation plan and policy for direct impacts of mining on adjacent farms, such as loss or pollution of land; • Establish a baseline of property values by conducting baseline valuations on representative properties and providing such to landowners, thereafter conducting monitoring valuations in periods as may be agreed with landowners; • Establish a communication channel with direct adjacent land owners to address impacts and grievances; • Screen mining activities from the adjacent farms and the main access road to minimize the impact on the general sense of place and tourists; • Procure goods

															and services from local or provincial suppliers as far as possible; • Procure ancillary services for goods purchased from outside of the Limpopo Province such as installation, customisation and maintenance, from local or provincial companies as far as possible. • Unskilled job opportunities should be afforded to the local households in ward 26 as a priority labour force sending area. Even if The Nakedi Solutions Mine uses a recruiting agency, the local CPA and local ward Councillor should be utilized and involved in the recruitment process; Establish a database of local people with information on qualifications and skills, utilize this database to

															develop skills plans and recruit local people; • Implement early on skills development programmes in the areas where most job opportunities will be created, i.e. operators and drivers; • Include training for general life skills such as financial management and health; • Implement portable skills development programmes; • Design and implement economic development programmes that will assist people being retrenched in sustaining their livelihoods; • Establish a future forum with representation from the workforce to discuss potential difficulties and solutions; • Implementation of programmes mitigate the

															impact of downscaling and retrenchment; • Through consultation with relevant key stakeholders, identify the segment that might benefit from informal indirect opportunities, and promote skills development and subsidization initiatives that are sustainable. Encourage, in consultation with key stakeholders, construction workers to use local services; • Equal opportunities for employment should be created to ensure that the local female population also have access to these opportunities bearing in mind that the Blouberg area has a greater female population; Individuals with the potential to develop their skills should be afforded training opportunities as part of the Mines SLP. Mechanisms

																should be developed to provide alternative solutions for creating job security upon completion of the project. • Payment should comply with applicable Labour Law legislation in terms of minimum wages. Where local labourers are employed on a more permanent basis, these labourers should be registered with the Unemployment Insurance Fund (UIF), Pay as You Earn or any other official bodies as required by law. This would enable the workers to claim UIF as a means of continuous financial support when the workers' positions on the construction itself has become redundant or once the construction and operational phase comes to an end.
Preparation of the foot print	Baseline	Increased noise levels on														• Construction activities to

area	Noise Level	the proposed site													take place during daytime (6am – 10pm) only; • Biannual noise assessments along the boundaries of the site to take place to identify noise intrusions; • All machinery and/or plant which radiate noise levels exceeding 85.0dBA to be acoustically screened off; • All vehicles operational at the site to conform with the following health and safety standards: Noise Induced Hearing Loss Regulations, Occupational Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational Hygiene Regulations, MHSAct (29 of 1996) • Selecting equipment with lower sound power levels; • Installing acoustic enclosure or machinery
Preparation of the foot print area	Baseline Noise Levels	Increased noise levels off the proposed Site													
Civil construction	Baseline Noise Level	Increased noise levels along the boundary of the proposed Site													
Civil construction	Baseline Noise Levels	Increased noise levels at the proposed open pit area													
Grading and building of new roads	Baseline Noise Level	Increased noise levels along the boundary of the proposed Site													
Grading and building of new roads	Baseline Noise Levels	Increased noise levels at mine area													
Construction of buildings and/or plant	Baseline Noise level	Increased noise levels along the boundary of the proposed Site													
Construction of buildings and/or plant	Baseline Noise Levels	Increased noise levels along the boundary of the proposed Site													
Mining activities area	Baseline Noise Level	Increased noise levels at open pit and plant													
Mining activities area	Baseline Noise Levels	Increased noise levels on the proposed site													

Hauling of ore to siding or via road	Baseline Noise level	Increased noise levels off the proposed Site														and/or pars causing radiating noise • Berms with a potential to act as a noise barrier should be constructed as soon as possible around open cast pits and other mining activities with the barrier being built as close as possible to the operations or at operations or at receptors as is feasible as possible. • It is recommended that theheight of the berms/barriers be at least 2 m higher than the line of sight to the highest noise source from open cast pits and stockpile areas, although the higher the berm/barrier the better acoustical screen it will be. Certain heavy vehicles have their exhaust ports above the cabin of the vehicle and needs to be considered as the noise source point.
Rehabilitation: Covering of open pit with capping layer and top soil	Baseline Noise level	Increased noise levels along the feeder roads														
Rehabilitation: Covering of open pit with capping layer and top soil	Rehabilitation: Covering of open pit with capping layer and top soil	Rehabilitation: Covering of open pit with capping layer and top soil														
Removal of buildings and infra- structure	Removal of buildings and infra- structure	Removal of buildings and infra- structure														
Vehicle movement and Transportation of Iron via road	Vehicle movement and Transportation of Iron via road	Vehicle movement and Transportation of Iron via road														
Transportation of Iron via road	Roads and Traffic	Delay at Intersections														
Transportation of Iron via road	Roads and Traffic	Social Impact (unsafe pedestrian and drivers conditions)														

																• The barrier should be sufficiently long to block the line of sight from receptors to the sides of the mining operations; • Minimize any work that needs to take place at night. Night-time construction work should be limited to localities that are further than 2km from a noise sensitive community when there is a direct line of sight (no barrier between the activity and receptor); ○ 1km from a noise-sensitive community when there exists a barrier between the activity and receptor; ○ Using the smallest/quietest equipment when operating near receptors; ○ 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 on open cast pits and stockpile areas;

vi) Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

The assigning of the significance to potential impacts is integration of the severity (magnitude of the potential impacts), type of the impact, extent to which the impact will occur, probability of the impact (the likelihood of the impact occurring) and the duration of the impact. This is the best judgment of whether the impact is important or not within the broad context, once the mitigation is taken into account.

By using the combination of these criteria, impacts have been assigned a rating of high (H), medium/moderate (M), low (L), very low (VL) or no impact. A significance rating is assigned twice to the impact. Firstly, to indicate significance without mitigation or optimization. Secondly, to indicate significance after mitigation or optimization. This is done to highlight the importance of mitigation or optimization of potential impacts.

CATEGORY	DESCRIPTION/DEFINATION
High	**Impacts will be of high significance if one of the following apply:** The extent is national to international; The duration is long term to permanent; The severity will be high; Probability is definite
Moderate	**Impacts will be of moderate significance if one of the following apply:** The extent is local to regional; The duration is medium to long term; The severity is major; The probability is highly probable
Low	**Impacts will be of low significance if one of the following apply:** The extent is local; The duration is temporary to permanent; The severity is low; The probability is probable
Very Low	**Impacts will be of very low significance if one of the following apply:** The extent is site-specific The duration is temporary to permanent; The severity is very low The probability is improbable
No Impacts	A potential concern of impact which, upon evaluation, is found to have no impact

This section provides a description of the methodology that was applied to assess the significance of environmental impacts. The significance will be determined by both the extent and duration of the impact. The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk and follows the rating process established by the impact/risk assessment formula:

Significance= Consequence x Probability, WHERE.

Consequence= Severity + Spatial Scale +Duration, AND

Probability = Likelihood of an impact occurring

The matrix first calculates the rating out of 75 and then converts this into a percentage out of 100. The percentage is the figure quoted in the matrix. The weight assigned to the various parameters for positive and negative impacts in the formula is presented in the Table below.

Table 0-4: various parameters for positive and negative impacts

Rating	Severity		Spatial Scale	Duration	Probability
	Environmental	Social/Cultural Heritage			
7	Very significant impact on the environment. Irreparable damage to highly valued species, habitat or ecosystem. Persistent severe damage.	Irreparable damage to highly valued items of great cultural significance or complete breakdown of social order.	International	Permanent to mitigation	Certain/ Definite
6	Significant impact on highly valued species, habitat or ecosystem.	Irreparable damage to highly valued items of cultural significance or breakdown of social order.	National	Permanent mitigated	Almost certain/ High probability
5	Very serious, long- term environmental impairment of ecosystem function that may take several years to rehabilitate.	Very serious widespread social impacts. Irreparable damage to highly valued items.	Province/Region	Project life (The impact will cease after the operational life span of the project)	Likely
4	Serious medium term environmental effects. Environmental damage can be reversed in less than a year.	On-going serious social issues. Significant damage to structures / items of cultural significance	Municipal Area	Long term (6-15 years)	Probable
3	Moderate, short- term effects but not affecting	On-going social issues. Damage	Local	Medium term (1-5 years)	Unlikely/ Low probability

	ecosystem function. Rehabilitation requires intervention of external specialists and can be done in less than a month.	to items of cultural significance.			
2	Minor effects on biological or physical environment. Environmental damage can be rehabilitated internally with/ without help of external consultants.	Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Limited	Short term (Less than 1 year)	Rare/ improbable
1	Limited damage to minimal area of low significance, (e.g. ad hoc spills within plant area). Will have no impact on the environment	Low-level repairable damage to commonplace structures	Very Limited	Immediate (Less than 1 month)	Highly Unlikely/ None

Significance

Consequence (severity + scale + duration)

Probability/Likelihood	1	3	5	7	9	11	15	18	21
1	1	3	5	7	9	11	15	18	21
2	2	6	10	14	18	22	30	36	42
3	3	9	15	21	27	33	45	54	63
4	4	12	20	28	36	44	60	72	84
5	5	15	25	35	45	55	75	90	105
6	6	18	30	42	54	66	90	108	126
7	7	21	35	49	63	77	105	126	147

Significance		
High	108-147	
Medium-High	73-107	
Medium-Low	36-72	
Low	0-35	

Potential impact of each main activity in each phase, and corresponding significance assessment

i) **The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.** (Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

Potential impacts that were identified during the Scoping process are discussed under environmental component headings in this section. As indicated, the project would result in moderate to adverse surface disturbances on the pit area as the planned Mining in only in the pit area but this area will be fenced off to avoid any accidents and the mining activities would be managed and also rehabilitation will occur after mining ceases.

- **Advantages**

Since the area concerns was selected based on desktop studies and literature review, we have found that the area's geology is that which is of the Wylliespoort formation which hosts minerals such as Iron ore, Manganese, Gemstone and Silica etc., this area is best suitable for the Mining of Iron Ore, Manganese, Gemstone And Silica and the fact that it these area is held by Nakedi Solutions on a prospecting right an added advantage.

- ❖ There will be Job creations in the area due to a new mine open and employment will increase.
- ❖ Total revenue of the Blouberg Municipality will grow including various sectors such as Retail, Hospitality, Eco-Tourism; Municipal will all increase in revenue as the number of employed people has increased as well as new residence in the towns of Baltimore, Tolwe and Mokopane.
- ❖ The receiver of revenue which will be SARS will have an increase in revenue from the Mine as well as Baltimore, Tolwe and Mokopane residents. This in return will have a good impact on the service delivery in the Capricorn District.
- ❖ The SLP project will have a boost to the municipality as they will be having additional cash injection from the Mine.
- ❖ No surface water pollution as there is no known active streams in the area
- ❖ There will be skills development in the area due to the mine offering training and bursaries.

- **Disadvantages**

- ❖ The disadvantage of going to alternative is that the grades are of poor quality to say the least. The Iron ore, Manganese, Gemstone and Silica are not sellable.
- ❖ The mine will create traffic congestion in the area
- ❖ Possible dust to occur if it is not properly managed
- ❖ Noise from mining machines
- ❖ Possible ground water pollution if no monitoring and mitigation are implemented
- ❖ Loss of biodiversity during soil stockpiling
- ❖ Loss of capital for PR and Mining right activities.

vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

This section focuses specifically on the alternatives relating directly to the proposed Iron mining project, further impacts are detailed in the section below, and therefore not repeated here. The alternatives discussed are:

- Proposed open Cast Mining
- Pollution Control Dam
- Storm water management infrastructure
- Processing Plant
- Water Treatment Plant and sewage treatment plant
- Infrastructure and Roads (workshops, discard dumps, temporary storage of ROM stockpiles, powelines and substations etc.)
- No-Go Option

viii) The possible mitigation measures that could be applied and the level of risk.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

Proposed mitigation measures to minimise adverse impacts.

- The performance of the site staff in terms of meeting the requirements of the mining programme should be monitored on an on-going basis.
- Any shortcomings should be addressed constructively and proactively through appropriate communication and training.
- Fencing erected around the mine should be maintained for the duration of the activities. This will require routine monitoring and repairs.
- To limit any disturbance to the soil surface natural vegetation or fauna including livestock, site staff should not be allowed to move on any roads or tracks other than the designated access/haul roads. Reasonable speed limit (20 to 4okm/h) should be maintained on the access/haul road at all times to prevent accidents excessive noise and dust.
- Water must be sprayed to avoid dust regularly and also monitor dust.
- Site clearance should be done in an environmentally friendly manner; clearance outside the demarcated areas of the mining area is strictly prohibited.
- All spoil material should be consolidated and stored at the allocated spoil areas for disposal or use as fill during the rehabilitation phase.

- All vehicles and equipment should be kept in a good working condition to limit hydrocarbons leaks, air pollution, and noise pollution and to ensure employee safety. Leaking equipment should repair immediately or removed off site, drip trays should be provided in construction areas for stationery plant.
- There must be provisions of dust bins and refuse plastic bags as a waste management measures.
- Run off should be monitored on an on-going basis and additional measures implemented as required.
- Fire is strictly prohibited on site.
- A chemical toilet must be provided on site and be regularly cleaned or serviced.
- On-going liaison with the communities and landowners and neighbouring should occur to ensure that they are appraised of the activities.
- No weapons or pets should be allowed on site.
- Damage of natural features should be avoided.
- The on-site management of solid waste such as construction debris, rubble, timber, tins, drums and domestic waste generated should be strictly controlled and monitored.
- No on site burying, dumping or burning of any waste materials including vegetation, litter or refuse, should occur.
- All personnel entering site must wear appropriate Personal Protective Equipment.
- Locals must be given first preference for employment
- The must be continuous monitoring of ground water levels and pollution
- The polluter must pay principle must apply and be enforced
- Proper diligent environmental studies must be conducted together with its specialists.
- Water recycling must be done to minimise drying of neighbours boreholes
- Monitoring and evaluation of the environment must be done regularly.

ix) Motivation where no alternative sites were considered.

The other areas which have been considered were found not to be suitable based on the Geology. Other areas were considered but unfortunately they were applications on the same place for the same commodity by other entities and also the fact that Nakedi Solutions had an existing PR on the very same area that the application for Mining has been lodged, the application is a renewal to the existing one. This left Nakedi Solutions with the current area for application. Other areas on the south and east do not possess the same geology and subsequently, the current applied land is the best under the circumstances.

However, looking at the Geology, there is another area but the grades of the Iron ore, Manganese, Gemstone and Silica are extremely poor and low.

x) Statement motivating the alternative development location within the overall site. (Provide a statement motivating the final site layout that is proposed)

The need and desirability for the project is supported by the need to graduate the existing prospecting right for the area to a mining right due to the confirmed prevalence of the relevant iron and other ore bodies.

In addition, with the implementation of the project it will ultimately lead to the increase in Gross Domestic Product (GDP) for the country which resembles the country's economic wealth and makes it more lucrative overall for foreign investment.

Alternative site locations for the mining and all other related infrastructure have been considered but due to the lack of confidence due to not drilling and not knowing the size and quality of ore there has no other alternative that has been considered.

The proposed locations of pits and related infrastructure were influenced by the following factors:

Previously Mined areas

- The area was previously mined and as such, this makes it easy for starting to mine in the area
- The of previous pits are in a good location

Open Cast Areas

- The quantifiable availability and location of the resources and appropriate mining method
- The location of open cast areas in relation to environmentally sensitive features

Water management Infrastructure

- Pollution control dams- to be located on already disturbed areas, low lying flat areas. 110% containment capacity and to be located within the dirty water areas.
- Storm water management infrastructure- Location of drains in relation to hills and areas of high conservation value

Processing Plant

- Design- the processing plant has been designed according to the standards required for the beneficiation process.
- Location- The location of the plant will be finalised based on finding a location on site which is low lying and flat to minimise visual impact as well as already cleared areas to reduce the destruction of indigenous vegetation

Water Treatment Plant and the sewage treatment plant

- Commissioning- It is proposed that the water treatment plant be commissioned at the onset of operations to treat pit decant water to reduce impacts on ground water quality however this must not be cast on stone in terms of time frames.
- Location- The location of the plant will be finalised based on finding a location on site which is low lying and flat to minimise visual impact as well as already cleared areas to reduce the destruction of indigenous vegetation.

Infrastructure and road (offices, buildings, sub stations, discard dump, workshops, road, powerlines)

Existing road network- on and off site there is a good network of road that can be utilised for the project to minimise additional disturbances Areas of high visual view shed- Infrastructure to be constructed in low lying areas to minimise the view shed. It should be further be noted that the access to the site is gained through a private road which is on the Langebaan farm wholly owned by Mardi Boerdery and such access must be obtained from the land owner. Screening with indigenous vegetation is also crucial which can be reached by reducing the tree removal around the boundary of the project site to limit the visual impact to the site

High ecology sensitivity areas- Construct on already disturbed areas to limit destruction of indigenous vegetation.

Existing power lines lies in the middle of Farm Bronkhorsfontein 42LR, running in a north to south direction.

The tailing dump will be located not far from the pit in order to reduce the distance of travelling as well as the processing plant.

h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The impact assessment stage comprises a number of steps that collectively assess the manner in which the proposed activity will interact with elements of the physical, biological, cultural or human environment to produce impacts to resources/receptors. ERM have developed a clearly defined impact assessment methodology that is used by ERM offices globally. It is our belief that the impact assessment methodology is sound and adequate to assess the potential impacts and opportunities associated with the proposed development and operation of the main operation, overland conveyor. The methodology used to assess the potential impacts is outlined below;

Identification of Alternatives

The identification of alternatives provides the rationale for the proposed (preferred) option(s) to the decision making authority. Project alternatives considered include alternative audit locations with associated surface infrastructure, audit configurations across the mining area and alternative overland conveyor routes.

Baseline Data Collection

- The description of the baseline environmental and socio-economic conditions provides information on receptors and resources that have been identified as having the potential to be significantly affected by the proposed Project. It also describes baseline conditions that have

been used to make the assessment. The description of the baseline is aimed at providing sufficient detail to meet the following objectives:

- To identify the key conditions and sensitivities in areas potentially affected by the proposed Project;
- To provide a basis for extrapolation of the current situation, and development of future scenarios without the proposed Project;
- To provide data to aid the prediction and evaluation of possible impacts of the proposed Project;
- To understand public concerns, perceptions and expectations regarding the proposed Project;
- To allow the proposed Project to develop appropriate mitigation measures; and
- To provide a benchmark to assess future changes and to assess the effectiveness of mitigation measures.

Public Participation

The key principle of consultation is to ensure that the views of the public are taken into account and reported in the Environmental Impact Assessment report. The objective is to ensure the assessment is robust, transparent and has considered the full range of issues or perceptions, and to an appropriate level of detail.

Definition of "Public – Public include those individuals, groups or organisations who themselves could be directly affected by the proposed Project (Project affected people) and those individuals or organisations who, although not directly affected by the proposed Project, represent those affected or have a regulatory duty, an interest, influence or secondary involvement in the proposed Project.

The methodology used to determine and rank the nature, significance, consequences, extent, duration and probability of each of the potential impacts and risks that have been identified was described in detail in ***Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks***; of this report. Impacts are assessed below in terms of the following summarised criteria (for details refer to ***Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks***;):

Nature of impact –proposed listed activity or project.

Extent – Spatial Influence of the impact (site only, local, regional, national, international).

Magnitude- Intensity of the impact (zero, very low, lo, medium, high)

Duration – Period of time the impact will affect an aspect (immediate, short term, medium term, long term, permanent).

Probability of occurrence - The estimated chance of the impact happening (improbable, low, medium, high, definite).

S*ignificance* = (Magnitude + Duration + Extent) x Probability. (Low, medium, high).

Reversibility of the impact – the ability of an impact to be changed from affecting an aspect to not affecting an aspect (reversible, partially reversible, irreversible).

Irreplaceability loss of resources- The amount of resource that can or cannot be replaced (replaceable, partially replaceable, irreplaceable).

Other aspects considered is the degree to which the impact can be mitigated and the confidence rating which is the level of certainty of an impact occurring.

The significance of each identified impact described in Table1: Positive and negative impacts considering the alternatives described for the proposed Nakedi Solutions Project has been assessed based on the criteria and is tabulated in **Table 0-5**: Assessment of each identified potentially significant impact and risk.

i) Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Table 0-5: Assessment of each identified potentially significant impact and risk

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**SIGNIFICANCE** if not mitigated	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	**SIGNIFICANCE** if mitigated
Site clearing, removal of topsoil and vegetation	Air Quality	Variable Dust generation from as land clearing, topsoil removal, loading of material, hauling, grading, stockpiling, bulldozing and	Construction	Moderate	Topsoil should not be removed during windy seasons/months (August, September and October) due to associated wind erosion heightening dust levels in the atmosphere. • The area of disturbance must be kept to a minimum	Moderate

		compaction			and no unnecessary clearing of vegetation must occur. • Topsoil should be re-vegetated to reduce the exposure areas. • During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised. • Water or other binding agents such as (petroleum emulsions, polymers and adhesives) can be used for dust suppression on earth roads. • When using bulldozers and graders, there is need to minimise travel speed and distance and volume of traffic on the roads. • Stockpiles should not be left for prolonged periods as wind energy generates erosion and causes more dust to form. • It should be noted that emissions generated by wind are also dependent on the frequency of disturbance of the erodible surface and therefore covering the stockpiles with vegetation would reduce the negative erosion effect. • Any crusting of the surface	

					binds the erodible material. • All stockpiles should be damped down, especially during dry weather or re-vegetated (hydro seeding is a good option for slope revegetation).	
Construction of surface infrastructure (e.g. access roads, pipes, storm water diversion berms, change houses, admin blocks, drilling, blasting and development of adits for mining, etc)	Air Quality	Activities of vehicles on access roads, levelling and compacting of surfaces, as well localised drilling and blasting will have implications on ambient air quality. The above mentioned activities will result in fugitive dust emissions containing TSP (total suspended particulate, giving rise to nuisance impacts as fallout dust)Bulldozing, excavation, drilling and blasting operations will	Construction	Moderate	• Dust emitted during bulldozing activities can be reduced by increasing soil dampness by watering the material being removed thus increasing the moisture content. • Another option would be to time the blasting with wind to ensure the dust will not be blown to the sensitive receptors or especially the community. • Blasting should also not take place when poor atmospheric dispersion is expected i.e. early morning and late evening. • Materials need to be removed to dedicated stockpiles to be used during rehabilitation. • The hauling of materials should take place on roads which are being watered and/or sprayed with dust suppressant. • To reduce the amount of dust being blown from the	

		result in the emission of dust to atmosphere			load bin in the haul roads, the material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers. • Constricting the areas and time of exposure of pre-strip clearing in advance of construction to limit exposed soil surfaces	
General transportation, hauling and vehicle movement on site	Air Quality	Transportation of the workers and materials in and out of mine site will be a constant feature during the construction phase. This will however result in the production of fugitive dust (containing TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads. dust emissions from haul track,	Construction	36	Hauling of materials and transportation of people should take place on roads which is being watered and/or sprayed with dust suppressant. • To reduce the amount of dust being blown from the load bin in the haul roads, the material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers. • In order to mitigate the impacts of the activity, the speed limit should be kept to the low as more dust will be generated at higher wind speeds. • Speed limits need to be observed and adhered to. • Management should fit	16

					roads with speed humps to ensure adherence. • Application of wetting agents or application of dust suppressant to bind soil surfaces to avoid soil erosion. • The drop heights should be minimised when depositing materials to the ground. • Encourage car-pool and bulk delivery of materials in order to reduce the number of trips generated daily.	
Removal of overburden, mineral extraction and backfilling when possible (including drilling/blasting hard overburden & stockpiling)	Air Quality	Drilling is an intermittent exercise that emits fugitive dust. There will be fumes from diesel trucks transporting ore to the stockpiles and conveyor belts at crushing and screening facilities. The conveyor belts deposit the minerals into the crusher, the crushing process	Operational	52	• Drilling by the nature of the action required to drill holes can produce a lot of dust. Drilling rigs for hole diameters over 50 mm generally have their own dust collectors which suck the drill cuttings to a large cyclone separator on board, which dumps the larger cuttings (over 2-3 mm); the finer dust is collected on filter elements and dumped by intermittent reverse air pulses through the elements. Cyclones can be used in many other applications and present a very good method	29

		releases fugitive dust. Activities by machinery in the mining process will lead to exhaust fumes from vehicles and dust from drilling and blasting processes. Fugitive dust (containing TSP, as well as PM10 and PM2.5) occurs as a result of the aforementioned processes.			of capturing dust. • Use of pre-blast environmental checklists, real-time weather monitoring data and stringent controls on blasts carried out in sensitive areas • A no-blast arc is automatically calculated for the nearest private residence based on the latest relevant weather conditions, including wind speed and direction, temperature inversions and amount of atmospheric turbulence (i.e. stability category) before the blast can be fired • Respiratory protection should only be used to control the dust exposures where other dust collection or suppression systems have not been able to reduce the dust to acceptable levels. • When using hand held rock	

					drills efforts should be made to control dust at source e.g. water injection or extraction. If control of dust at source is not practicable then respiratory protection should be used. • Low or in-pit dumping of overburden during high wind conditions • There is need to have water sprays. • Filtration systems can be utilised to remove the pollutants from the underground air prior to their release to the surface via the vent. • Use of efficient diesel fuel for heavy underground machinery. • Successful trialling of broad acre temporary rehabilitation of unshaped overburden emplacement areas by aerial sowing of a cover crop, providing an established vegetative	

					stabilisation to minimise the potential for windblown dust generation • Constricting the areas and time of exposure of pre-strip clearing in advance of mining development	
Use and maintenance of haul roads (incl. transportation of minerals to plant	Air Quality	Transportation of the workers and materials in and out of mine site will be a constant feature during the operational phase and result in the production of fugitive dust containing TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads. Substantial secondary emissions may	Operational	42	• Formulation and implementation of sound management plans for all operations likely to create dust • Planting plenty of trees or hedges as shelterbelts to eliminate or minimise wind disturbance • Planning operations to maximise the benefit of wind Breaks Disturbed areas such as those caused by stripping off grass and topsoil should be kept to a minimum • Haul roads and standing areas should be sealed or concreted where possible • Use water sprays or water carts to settle dust. Care must be taken to ensure that the water used is free from pollution by noxious matter. There are additives available that reduce the volume of water used, and increase its effectiveness, but approval to	16.8

		be emitted from material moved out from the site during grading and deposited adjacent to roads			use them should be obtained from the local territorial authority. • Use of a global positioning system as a tool to track the locations of mining and dust suppression equipment (e.g. water carts) and cross-referencing this information with real- time weather monitoring to assist with dust control • Use of water sprays at each contact or transfer point along the conveyance system which have adjustable rates of application (low, medium and high) depending on dust levels • Automatic water sprays installed at the ROM hopper bin that produce a fine mist to suppress dust generated with the triggering of sensors when a truck enters the dump zone and automatic sprays activated until a set time following the departure of the truck • Use of a reclaim tunnel at the product stockpile and an enclosed conveyor to transfer minerals to the loader, both of which minimise dust generation • Use of a retractable	

					telescopic chute with curtains to load minerals into transport trucks • Speed restrictions should be imposed and enforced • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust • Exhaust pipes of vehicles should be directed so that they do not raise dust	

The supporting impact assessment conducted by the EAP must be attached as an appendix, marked **Appendix**

j) Summary of specialist reports.

(This summary must be completed if any specialist reports informed the impact assessment and final site layout process and must be in the following tabular form):-

Table 0-6: Recommendations as per specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Soil, Land Use and Land Capability	Recommendations to minimize the impact of soil erosion, soil compaction, chemical soil pollution and the loss and sterilization of topsoil include: • Develop and implement a soil stripping and management plan in consultation with a soil specialist and an engineer of geologist • Restrict access of vehicles and construction vehicles to existing roads or dedicated roads • Once stockpiles have been established they should not be moved around to other areas but directly used for rehabilitation again to avoid creating more compacted areas. Soil stockpiles must be sampled, ameliorated (if necessary) and re-vegetated as soon after construction as possible		**Annex: Environmental Impact Assessment**
Heritage Impact Assessment	The Archaeological and Cultural Heritage Phase I Impact Assessment for the proposed mining has identified no significant impacts to archaeological or grave resources that will need to be	**X**	**EIR and EMP**

	mitigated prior construction and during the mining. The structures (Houses & warehouse) which were noted on the southern and northern sections will not be negatively affected by the proposal, and will rather be integrated into the proposed development. **HERITAGE IMPACT ASSESSMENT** ❑ **RECOMENDATIONS:-** • Based on the findings of this study, the proposed mining development and associated developments are feasible. Therefore, the proposed mining development should be approved. • The foot print impact of the proposed mining development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds. • Should any unmarked burials be exposed during construction affected families must be trekked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA before any grave relocation can take place. • A professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999. Should archaeological materials or human burials remains be exposed during subsurface construction work on any section of the proposed mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made as well as call and report the matter to the police		

Air Quality and Dust management	• It is recommended that comprehensive dust management plan where dust buckets stands should be strategically erected to the main areas or sensitive receptor area to verify predicted gravimetric dust impacts and refine controls accordingly. Dust monitoring should be undertaken on monthly basis during operation to analyse the Gravimetric Dust Fallout content. • The PM10, SO2, CO and VOC concentrations determined through active sampling in order to measure these variables against national ambient air quality guidelines should be conducted in a quarterly basis in order verify predicted operational impacts with the aim of lowering SO2 and PM10 concentrations when the operation resumes. Dust suppression in the form of water spraying the areas of frequent vehicular movement should be done in a 6 hours interval to minimize the generated dust whilst avoiding water accumulation to the surface or on a need to basis. And where the demand is high, the timeframe could be shortened and where the demand is low, the timeframe must be extended **AMBIENT AIR QUALITY** ❑ **FINDINGS AND RECOMMENDATIONS :-** • Dust generation, is not of concern due to the fact that the mine locations in not close proximity to houses and villages in the Blouberg area. • The mine does not fall under the management of the AQMP. • A proper dust suppression plan should be developed that contains precautions, which	**X**	• **EIA and EMP** • **Baseline Air Quality**

	• Prevent the transfer of dust from truck wheels onto paved roads. • To avoid dust problems, roads should be properly maintained by surface grading and shaping for cross-sectional crowning to prevent excessive road surface wearing and consequent dust generation.		
Traffic	**TRAFFIC IMPACT ASSESMENT** ❑ **FINDINGS AND RECOMMENDATIONS :-** • The proponent must use R561 as an access road to the mine; • An exit and access gates be separated of which the proponent has made a provision to meet this requirement • Signage and traffic calming infrastructure that reduce the speed from 60 km/h to 30-40 km/h for heavy vehicle and vehicles turning to access the mine must be considered on the gravel road. • Additional lanes be integrated into the main lane for turn off to exit the main traffic flow and joining lane from the mine to the main traffic flow be constructed. • Provision should be made on site to accommodate the safe loading and off-loading of staff using public transport. • Traffic generated or attracted by the proposed mining has no significant impact on the level of service on the nearby roads and intersections. Therefore, there is no need for any road geometric upgrades.	**X**	• **EIR and EMP** • **Traffic Impact Assessment report**

Ground water and surface Water	**GROUNDWATER IMPACT ASSESSMENT** • • These studies will be conducted during the WULA process.	**X**	**EIR and EMP**
Ecology	• The study site falls under the Central Bushveld and the vegetation type found within the proposed area Roodeberg Bushveld. Majority of this vegetation has been transformed by agricultural activities on the neighbouring properties. • In terms of Limpopo Conservation Plan, the proposed project falls within Ecological Support Area 1, Critical Biodiversity Area 2 and No Natural Remaining. Although the sensitivity map shows that site falls within these conservation areas, ground truthing revealed that the proposed project site has been previously transformed as a result of anthropogenic activities which include mainly mining, crop and livestock farming. **FLORA AND FAUNA ASSESSMENT** • The assessment revealed that the site has been previously transformed due to previous open cast mining and mixed farming activities. Areas that have been moderately modified are mainly low-lying areas and hills that were previously mined. **FAUNA** • No mammals were observed during the survey.	**X**	• **EIR and EMP** • **Ecological Impact Assessment report**

	• Only two reptile species were recorded; the Rock monitor (Varanus albigularis) and the Bushveld Lizard (Heliobolus lugubris) respectively. • No Red Data Listed species were encountered, although they have a high probability of occurring. • Due to the diversity of habitat types present, a wide variety of avian species occur. • Among others, Birds species that were identified on site are generalists that are not sensitive to land transformation. These include; Black-headed Heron (Ardea melanocephala) and Laughing Dove (Spilopelia senegalensis). • No Red Data Listed avian species were encountered, but various protected and sensitive bird species are known to occur in the region, and have a high probability of occurring in the study area. **SENSITIVE AREAS** • Although the sensitivity map shows that site falls within these conservation areas, ground truthing revealed that the proposed project site has been previously transformed as a result of anthropogenic activities which include mainly crop and livestock farming. **ECOLOGICAL SENSITIVITY CLASSIFICATION** • In terms of Limpopo Conservation Plan, the proposed project falls within Ecological Support Area 1, Critical Biodiversity Area 1, Critical Biodiversity Area 2 and No Natural Remaining.		

	❑ **FINDINGS** • It was found that there are several habitats within the proposed site that have been exposed to high levels of disturbance resulting from previous open cast mining activities, vegetation clearance, and farm dwellings. • There are also areas that still have intact vegetation; such areas are associated with Koppies. As a result, the ecological integrity of the site is in fair condition, and it can maintain the ecological processes. • In terms of fauna, only two reptile species were recorded. • The main impact that the proposed opencast mining project will impose will be ecosystem functioning disturbance the due to the removal of vegetation. • Clearance of vegetation often affects the soil as it expose it to harsh environmental conditions. ❑ **RECCOMENDATIONS:-** • An EMP should integrate a Rehabilitation Plan, compiled as part of management action; for species of ecological importance that will require rescue & replanting and faunal species removal and relocation. • A site specific assessment should be conducted to determine the protected and ecological important plant species within the affected areas should be conducted. • Avoid any unnecessary vegetation clearance where possible. • All temporary stockpile areas including litter and dumped material and rubble must be removed on completion of site		

	establishment. • No painting or marking of vegetation shall be allowed. Marking shall be done by steel stakes with tags, if required. • Avoid translocating topsoil stockpiles from one place to another or importing topsoil from other sources that may contain alien plant propagules. • Avoid releasing waste water into the environment. • All construction plant and vehicles should be maintained and be in good condition. • Only necessary damage must be caused: for example, unnecessary driving around in the site should not take place.		
Social Impact Assessment	**SOCIAL IMPACT ASSESSMENT** • The significance and probability of population related impacts is high. Mitigation is expected to attenuate impacts relating to the inflow of outsiders seeking jobs and changes in population composition. • Safety and security impacts can range from burglary and/or armed robbery. The impacts are rated as likely but their significance can be reduced to moderate levels with an extensive range of practicable mitigation measures that can be implemented successfully. ❑ **RECOMENDATIONS:-** • The project should go ahead on the conditions that, the developer must maintain frequent communication with the	**X**	**EIR and EMP**

	communities, taking into consideration the needs of different groups i.e. neighbouring land owners, farmers and community members. • To ensure that the project benefits the community, the identification of local people and suppliers must commence prior to commencement of mine. • Contractors should be encouraged to employ as many local people to maximise benefits to immediately affected communities. Local people should be given first preference. • Local contract workers should be registered on the database of suppliers so that they may have access to other employment options. • The impacts that could be experienced as a result of the influx of job seekers and employees are the main potential negative impact in light of the vulnerability of the communities in the study area.		

Copies of Specialist Reports have been attached as appendices**.**

The following specialist investigations were undertaken as part of the project:

- Air Quality Impact Assessment;
- Ecological Impact Studies;
- Heritage Impact Studies;
- Geotechnical Studies;
- Traffic Impact Studies
- Blasting and Vibration impact study.

k) Environmental impact statement

The mining ROM is hematite ore (iron oxide) and according to the Material Safety Data sheet is there no dangerous classification regarding any acid or phosphor **that can pollute groundwater** in the catchment area of the mining rights area as proposed.

(i) Summary of the key findings of the environmental impact assessment;

Key findings of the environmental impact assessment include:

- The significance of potential environmental impacts can be reduced to moderate-minor with implementation of mitigation measures and monitoring.
- Likewise, potential impacts on the socio-economic environment and livelihoods can be mitigated to moderate – minor significance.
- Cumulative noise and visual impacts are rated with a negligible significance.
- It is expected that cumulative impacts on surface and groundwater quality and biodiversity will be major prior to mitigation. Mitigation measures for these potential impacts include

The key finding of the Environmental Impact Assessment are categorised into sections.

1. The Baseline environment:

a. From the studies conducted it has been noted that the project area lies just outside the Vhembe Biosphere in an area that was previously mined and disturbed.
b. The area has moderate water restrictions due to the low rainfall and high temperatures
c. The site does not have much ecological biodiversity
d. The fact that it was previously mined makes the area more suitable for the proposed project
e. The area is located with the Roodeberg Bushveld vegetation type

2. Positive and negative Impacts of the project and proposed layout.

- The positive and negative impacts have been discussed on this document (The positive and negative impacts that the proposed activity (In terms of the initial site layout) and alternatives will have on the environment.)

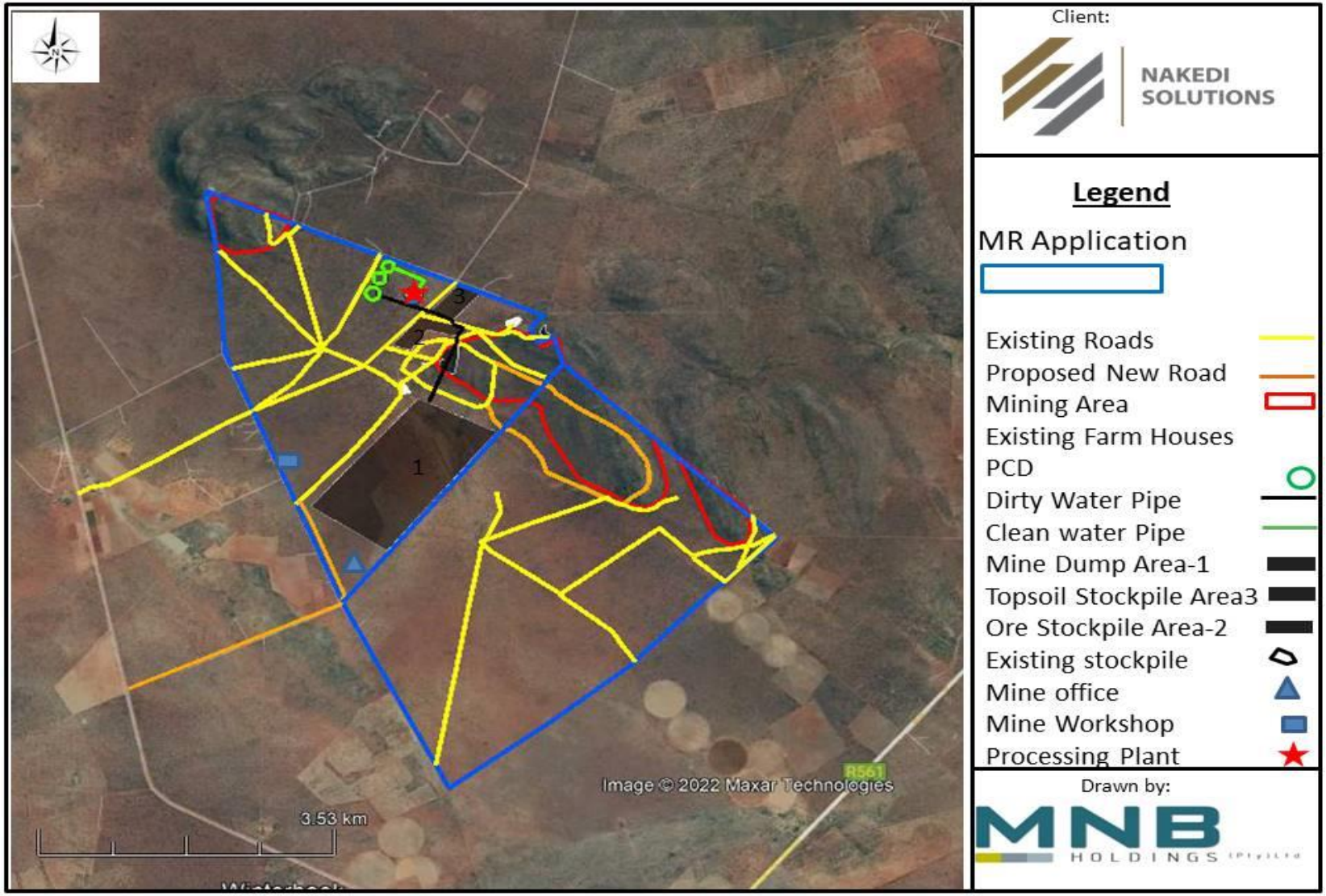
Application of best-practice water management at the operation rehabilitation of infrastructure after mine closure as well as continuous monitoring of surface and groundwater quality. The establishment of an “Additional Conservation Actions” (ACA) for the exclusive purpose of biodiversity rehabilitation, in particular the grasslands habitats in the immediate vicinity of **Nakedi Solutions;** project.

Table 0-7: Potential positive and negative impacts that the proposed activity will have on the environment

CONSTRUCTION PHASE		
Impact	**Significance before mitigation**	**Significance after Mitigation**
Loss of Vegetation	Low-negative	Very low-negative
Loss and impact on water feature	Low-negative	Very low-negative
Localised pit water dewatering	Low-negative	Very low- negative
Ground water and surface water contamination	Low-negative	Very low- negative
Change in visual aesthetic	Very low	Very low -negative
Increased noise generation	Low-negative	Very low -negative
Increased occurrence and spread of disease	Moderate-negative	Very low- negative
OPERATIONAL PHASE		
Change in visual	Low-negative	Very low negative
Degradation of air quality	Moderate-Low	Very low negative
Localised ground water dewatering	Low-negative	Very low negative
Decrease in agricultural potential	Moderate-negative	Very low negative

(ii) Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers .Attach as **Appendix**



(iii)Summary of the positive and negative implications and risks of the proposed activity and identified alternatives;

A detailed environmental impact assessment was undertaken for the project in order to establish the environmental sensitivities associated with the area and potential impact that the development may have on the receiving environmental conditions. It is envisaged that the development will have a positive impact on the socio-economic conditions of the surrounding area due to the fact that provide employment, economic fiscus and training opportunities required for the various mining. This will inevitably contribute to economic upliftment of the local community and the greater region. In addition to this, the project will provide a secure and long term supply of Manganese, Iron Ore and other related resources to the industry and ultimately lead to the increase in Gross Domestic Product (GDP) for the country which resembles the country's economic wealth and makes it more lucrative overall for foreign investment.

A variety of potential negative environmental impacts have been identified for the project which relates to nuisance factors (air, noise, traffic, visual), water quality degradation, loss of habitat, , as well as a potential for increased spread of diseases. It should however be noted that with the implementation of the proposed mitigation measures the overall significance of the negative environmental impacts will range between low to very-low negative. There are no alternatives area expected.

From the environmental impact assessment undertaken for the project and associated alternatives, the EAP has formulated the key environmental consequences to aid the Competent Authority (Department) with decision making purposes. This implies that in making the decision to authorise the project, the Department accepts the key environmental consequences (as outlined below) and associated mitigation measures for implementation.

Mining activities may contribute to dust nuisance to both livestock and humans. Though there are no receptors in close proximity to the mining area, movement of hauling truck will contribute to generation of dust. Furthermore dust could affect the wellbeing of both humans and livestock in the neighbouring farms.

- Risk of injury to public and animals
- Dust smothering of vegetation on the vicinity of the project
- Possible introduction of alien species

It is anticipated that unauthorised/uncontrolled access to site could result in danger of falling people and livestock/wild animals.

Table 0-8: Positive and negative implications and risks of the proposed activity

Activity	Alterative	Aspect	Negative	Positive
Open Pit Mining	Type of mining and areas mineable	Geology	Due to the shallow nature of the commodities, it is only feasible to mine opencast	Safer and cheaper
		Ground Water	groundwater quality will also be affected by polluting elements	
		Surface Water	Minimal impacts are expected on the as there is no surface water	No rivers near by
		Topography	temporary storage of stockpiles, discard dumps and topsoil will temporarily distort the topography	The area has a mountainous topography and when the pit is opened it may lead into a flat topography
		Soil	Soil will be lost during excavations and stop piles erosion even if mitigation measures are implemented	
		Topography	The topography or the area is relatively mountainous and the open pits will leave the area flat even after rehabilitation Temporary storage of stockpiles, discard dumps and topsoil will temporarily distort the topography	
		Soil	• Excluding flood line and riparian areas from the open pit mining will reduce the footprint of the mining area. • Soil will be lost during excavations and erosion even if mitigation measures are implemented	

		Land Capability	The land capability will be lost in areas where excavation and open pits will be located. The chemical properties of the soil will be altered due to pollution from hydrocarbons, oils, Iron dust, overspills from PCDs	
		Land Use	The land use will be lost from that of a farming activity value, however with proper mitigation the land can be rehabilitated to an acceptable level	
		Flora	• Not mining in the riparian areas minimises impacts on flora • The vegetation clearing of around 100-300heactres will lead to significant loss of indigenous species • Increased encroachment of alien invasive species on cleared land	
		Fauna	• The loss of these vegetation may lead to loss of habitats for animals • Displacement of fauna due to increased human activity like noise, blasting, vehicles, human behaviour and poaching	
		Air	Increased air pollution from the blasting activities, site clearing, vehicle movement and fumes and fugitive dust	
		Noise	Increased noise polluting from earthmoving equipment, heavy vehicles and machinery, processing plant, conveyor belts and blasting	

		Heritage	No impact on this aspect	No graves and heritage features in the area
		Climate Change	Due to vegetation cleaning , particulate matter from vehicles and machinery, increased fugitive dust it is expected that the climate will be locally affected by the increase in aerosols in the atmosphere as well as increased reflective surfaces	
		Socio-Economic	Various I&AP's concerned over the pollution plume of the mining activity, Acid mine drainage, reduction in groundwater levels to scarcity in a water strained area, this was the issue that was raised in the Scoping phase	The proposed mine will employ a total of 50-100 employees (skilled and unskilled during construction) There will be infrastructure development as part of the SLP for the Blouberg community Through local hiring and promoting of local SME's the project will have a positive impact on the local economy (this has been noted but I&AP"s requesting to supply fuel for the mine)
		Geology	The excavations will remove certain bedrock which will be discarded or used to rehabilitate the open pits but will be lost to the original stratigraphy	The area is a mountain and hence the area will be levelled.
		Ground Water	The excavation of the area will change	

			drainage patterns as well as infiltration and runoff	
		Surface Water		The PCD with a 110% capacity in case of spillage
		Wetlands and Pans		There is no wetland in the area
		Topography	The PCD will be constructed in a low lying flat area and will not alter the topography	
		Soil	Soil loss through clearing of land for the pollution control dam	
		Land Capability		The only capability of land is the graving of animals which will be moved to a different camp
		Land Use	Current land use lost as land capability is directly affected by the reduction in area due to infrastructure as well as loss in visual appearance land for infrastructure and roads	
		Flora	Vegetation will be lost during site clearing and construction. However it is recommended that the plant be constructed on already existing clearances to minimise vegetation loss	
Pollution control dam	Location and size	Fauna	• The clearance of vegetation will lead to a loss in habitat for birds, mammals and herpetofauna • Displacement of fauna due to increased activity and noise	
		Air	Increased dust levels, PM10, fumes during	

			the construction Phase	
		Heritage	None to be affected	No sensitive areas in this area according
		Noise	Increased noise levels are expected during construction	
		Social	• Increased visual disturbance to the on the on the site from the PCD • There were concerns of job losses in the eco-tourism industry	Skilled and unskilled labour creations (+) Potential local economy growth through hiring of architectural and engineering companies in the areas to provide the services
		Geology	The stormwater management features will have negligible effect on the geology as there will be no alterations to the bedrock	
		Groundwater	Possible ground pollutions for the neighbouring farmers	The stormwater management features will contain contaminated water separating it from clean water which is released and re-used in the operation.
		Surface Water	The construction of the stormwater management features will alter drainage patterns	The stormwater management features will contain contaminated water separating it from clean water
		Topography		The stormwater management features will be constructed around the hill with the

				possibility of using berms to redirect runoff around the site
		Soil	Soils will be lost albeit in minimal quantities where the features will be built	
		Land Capability	There will be minimal land use lost due to the infrastructure	
		Land Use	There will be minimal land capability lost due to the Infrastructure	
		Flora	Where possible the features will be constructed around vegetation of high conservation value. In cases where this is not possible there will be loss in flora	
		Fauna	• The construction of the features will cause a loss in vegetation • therefore habitats are lost • Changes in animal routine might be affected by the features	
Storm Water Management features (Clean and dirty water separation) Processing plant		Air	Aside from temporary fugitive dust and PM_{10} emissions during construction no residual air quality impacts are anticipated but will be reduced by dust suppression	
		Heritage	No impact	No impact
		Noise	There will be temporary noise pollution during construction but this will subside once complete	
		Social		Potential local economic growth through hiring of architectural and engineering

				companies in the areas to provide the services Skilled and unskilled labour creations
		Geology		The processing plant will not affect the geology
		Groundwater	Construction of the processing plant will lead the clearance of vegetation altering infiltration and runoff patterns. There are open areas on the project site and it is proposed by the EAP that Nakedi Solutions choose one of those areas as an alternative	The technology of the plant is considered to be one of the best in Iron beneficiation
		Surface Water		The vegetation clearing, compaction and infrastructure will not change drainage patterns
		Wetlands and Pans	No impact	No wetlands and pans were identified on site
		Topography	The plant will be constructed on relatively low flat land which has already been disturbed and this will not impact the topography	
		Soil	There will be soil loss during construction of the plant	
		Land Capability	The land capability of the plant foot print will be altered and lost	
		Land Use	The current land use is not compatible with mining; a rezoning certificate will need to be applied for prior to commencement of the	

			activity. The eco-tourism land use will be lost as the land capability is directly altered	
		Flora	Vegetation will be lost during site clearing and construction. However it is recommended that the plant be constructed on already existing clearances to minimise vegetation loss	
		Fauna	• The clearance of vegetation will lead to a loss in habitat for birds, mammals and herpetofauna • Displacement of fauna due to increased activity and noise	
		Heritage	No impact	
		Air	Air emissions from the use of chemicals and generators	
		Noise	Increased noise levels from the processing plant	
		Social	• Increased visual disturbance to the communities from the plant • Increase noise levels in the area might disturb the community	Potential local economy growth through hiring of architectural and engineering companies in the areas to provide the services Skilled and unskilled labour creations
	Phase of construction And	Geology		The water treatment plant will not affect the geology
		Groundwater	• Construction of the water plus the sewage	Earlier commissioning of the

	implementation		treatment plant will lead the clearance of vegetation. There are open areas on the project site and it is proposed by the EAP that UCDII choose one of those areas as an alternative • The sewage treatment plant should (+) Construction of the water treatment plant is advantageous in reuse of water reducing the mine's reliance on external water resources	plant can increase chances of early mitigation of acid mine drained as water from the pits will be treated before it is discharged to curb Acid Mine Drainage (AMD) be designed as a biofiltration process instead of chemicals, possibility of effluent spillages affecting the groundwater quality
		Surface Water	The vegetation clearing, compaction and infrastructure will change drainage patterns and rates of infiltration	
		Wetlands and Pans	None will be affected	No wetland was identified
		Topography	The plant will be constructed on relatively low flat land which has already been disturbed and this will not impact the topography	
		Soil	There will be soil loss during construction of the plant	
		Land Capability	The land capability of the plant foot print will be altered and lost	
		Land Use	The current land use is not compatible with mining, a rezoning certificate will need to be applied for prior to commencement of the activity. The eco-tourism land use will be lost as the land capability is directly altered	
		Flora	Vegetation will be lost during site clearing	

Water treatment plant and sewage treatment Plant Storm Water Management features (Clean and dirty water separation)			and construction. However it is recommended that the plants be constructed on already existing clearances to minimise vegetation loss	
		Fauna	• The clearance of vegetation will lead to a loss in habitat for birds, mammals and herpetofauna • Displacement of fauna due to increased activity and noise	
		Heritage		No areas of significance
		Air	• Air emissions from the use of chemicals and generators • Increased “bad smell” from the sewage treatment plant	
		Noise	Increased noise levels from the water and waste treatment plant due to increased activity and at the plants.	
		Social	Increased noise levels in the area might disturb the community	• Increased potential to supply water to the communities treated from the plant • Potential local economy growth through hiring of architectural and engineering companies in the areas to provide the services • Skilled and unskilled labour

				creations
		Ground Water	• The stormwater management features will have negligible Groundwater effect on the geology as there will be no alterations to the bedrock	
		Surface Water	The construction of the stormwater management features will alter drainage patterns	The stormwater management features will contain contaminated water separating it from clean water which is re-used again in the operations.
		Wetland and Pans		The stormwater management features will not impact the pans and wetland as there are none
		Topography		The stormwater management features will be constructed around the hill with the possibility of using berms to redirect runoff around the site straight into containment ponds for mine re-use
		Soil	Soils will be lost albeit in minimal quantities where the features will be built	
		Land Capability	There will be minimal land use lost due to the infrastructure	
		Land Use	There will be minimal land capability lost due to the Infrastructure	

		Flora	Where possible the features will be constructed around vegetation of high conservation value. In cases where this is not possible there will be loss in flora	
		Fauna	• The construction of the features will cause a loss in vegetation therefore habitats are lost • Changes in animal routine might be affected by the features	
		Air	Aside from temporary fugitive dust and PM_{10} emissions during construction no residual air quality impacts are anticipated	
		Heritage	Storm water features will be designed around heritage features	
		Noise	There will be temporary noise pollution during construction but this will subside once complete	
		Social		Potential local economic growth through hiring of architectural and engineering companies in the areas to provide the services Skilled and unskilled labour creations
		Geology		The construction of infrastructure and roads will not affect the geology
		Ground Water	• Increased compaction will negatively	

			impact runoff and infiltration which impacts the groundwater recharge. • Oils spillages during construction and use of roads will negatively impact the groundwater quality Increased water pollution and risk of AMD at the discard dump (to minimise impact the proposed discard dump area must be HDPE lined	
		Surface Water		No impact
		Wetlands and Pans		There are no pans and wetlands
		Topography		• The infrastructure will be constructed on relatively low flat land which has already been disturbed and this will not impact the topography • To minimise vegetation clearance it is proposed that Nakedi Solutions make use of the vast rod networks on and off the site
		Soil	Soil loss through clearing of land for infrastructure and roads	
		Land Capability	Land capability lost for infrastructure and roads	
		Land Use	• Current land use lost as land capability is	

			directly affected by the reduction in area due to infrastructure as well as loss in visual appearance land for infrastructure and roads	
Mine related Infrastructure including Roads, Workshops, powerlines, substation, workshops etc.	Location on site and route options	Flora	Loss of vegetation through site clearing for infrastructure	To minimise vegetation clearance it is proposed that Nakedi Solutions make use of the vast rod networks on and off the site
		Fauna	• The clearance of vegetation will lead to a loss in habitat for birds, mammals and herpetofauna • Displacement of fauna due to increased activity and noise • Electrocution of birds by power lines and at substations	
		Heritage		No heritage impact
		Air	Increased air pollution during construction activities, site clearing and during the operation phase from vehicle movement and fumes and fugitive dust	
		Noise	• Temporary increase in levels during construction • Noise level increases from haul trucks on and off the site as well as conveyer belts on site	
		Social	The I&AP's see the infrastructure as a disturbance to the visual character of the	• Skilled and unskilled labour creations

			area.	• Potential local economy growth through hiring of architectural and engineering companies in the areas to provide the services
		Noise		Noise would not be generated during the construction, operations and rehabilitation through the mining related activities.
		Topography, groundwater and surface water		• Sensitive landscapes will not be compromised including groundwater or surface water quality or quantity • The landscape will not be altered by the depressions which will be caused by the open pits mining and removal of iron however successfully rehabilitated.
		Flora and Fauna		No Loss of indigenous vegetation and habitats
		Soil and land Capability		The arable and wildlife land capability will not be changed and no soil losses through the construction, operations and

				rehabilitation through the mining related activities
		Visual Aspects		The visual landscape and sense of place attributes would not be compromised.
		Land Use		The current land use is quite profitable and ecologically sustainable and would continue generating income from ecotourism
		Heritage		The sites of historical and cultural importance would not be affected by the construction, operations and rehabilitation through the mining related activities
No-go project option (Not implementing the mining activity)	Not implementing the mining activity	Social and Economic Impacts	• Loss of potential investment opportunities in the project area and income generated from the sale of the product • Loss of potential employment creation and opportunities for local service providers • Loss of infrastructure development for the proposed SLP programs for the surrounding community • Loss of income already invested in the prospecting activities as well as related regulatory applications	

			• Loss of training programs for HDSA including bursaries, mentorship programs and career development plans • There would be direct losses to government through a loss in revenue from the mine (through taxes). • There would be direct losses to government through a loss in Revenue from the mine (through taxes). • The land claimants will also stand to lose out on the BEE partnership to be gained from the project.	
		I&AP	I&APs may be positively or negatively affected by the various impacts described above	I&APs may be positively or negatively affected by the various impacts described above

l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The main objectives of this EIAr and EMPr are to:

- Outline the environmental management measures related to the project activities;
- Identify areas of sensitivity which will need management/mitigation and protection
- Provide the contractors and /or subcontractors with guidelines for carrying out construction activities in such a way that harmful environmental impacts are minimized.
- Provide a foundation for the specific environmental management instructions contained in construction contract documents (where compliance will be a contractual obligation for the contractor).
- Provide an educational tool for orientation and training of project personnel and contractors.

A set of environmental management measures for implementation during the construction phase of the project has been prepared to meet the following overall environmental management objectives:

- Minimize disturbance to various plant species;
- Prevent and or reduce possible soil erosion;
- Minimizing disturbances to the local community (social impacts) though it is more than 10km away;
- Reduce socio-economic and environmental negative impacts to the nearby land owners
- Reducing negative visual aspects during the construction phase; and to
- Prevent and or minimize air and noise pollution; and to
- To avoid loss or damage to archaeological resources (should they be uncovered during construction).
- Operate in a sustainable environmental manner.

i) MANAGEMENT AND MONITORING

This section focuses on the systems and procedures required to ensure that the environmental specifications contained in the EMPr are effectively implemented, monitored and recorded.

(a) GENERAL MONITORING AND REPORTING

The appointed ECO as well as the contractors on site are responsible for ensuring compliance with the EMPr. Monthly EMPr compliance reports (audits) will be compiled by the ECO and submitted to the contractor for his/her review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the contractor. Interested and Affected Parties (I&APs) have the right to either raise non-compliance and to also monitor specific aspects of the EMPr (e.g. noise regulations, working hours stipulated) and must be allowed access to the EMPr

document in conjunction with the contractor in a reasonable and informal manner, without unreasonably disrupting construction activities.

The contractor shall keep a record of all complaints received from any I&APs and communicate them to the ECO and project manager. These complaints must be addressed and mitigated within a reasonable period of time. Records relating to the compliance/non-compliance with the conditions of the EMPr as well as audits reports shall be kept in good order. It is suggested that all records be kept for at least two years following construction activities for reference purposes.

(b) SPECIFIC ROLES AND RESPONSIBILITIES

- The roles of the responsible people on site are included below:

a. Applicant

- The applicant shall ensure that the EMPr forms part of all contract documents;
- The applicant must ensure that the contractor and his/her sub-contractors comply with all the environmental specifications outlined in this document;
- Assume overall responsibility for the effective implementation and administration of the EMPr;
- Ensure construction personnel are trained in accordance of the requirements of the EMPr.
- Ensure that a copy of the approved EMPr is on site at all times
- Provide PPE to all personnel on site be it directly supplying to the employees or through the contractor

b. The Contractor

- The contractor is responsible for complying with the EMPr during the operation phase of the development. The contractor is responsible for ensuring that his/her sub-contractors and their employees appointed by him/her are familiar with the EMPr and that they abide to conditions as set out in the EMPr. The contactor will be responsible for any non-compliance with the EMPr and will pay for any remedial work that may result from non-compliance resulting directly from his/her negligence.

c. Project Manager

The project Manager is responsible for overall management of project and EMPr implementation and has the following tasks:

- Be familiar with the recommendations and mitigation measures of this EMPr, and implement them;
- Monitor site activities on a daily basis for compliance;
- Conduct internal audits of the construction site against the EMPr;
- Confine the construction sites to the demarcated areas.
- Have meetings with various managers for update
- Make sure that all issues raised by the I&APs are addressed.

d. The Environmental Control Officer (ECO)

- ECO is responsible for communicating environmental issues associated with the site to the contractor and his sub-contractors. The ECO is responsible for the explanation of environmental issues contained in this EMPr to anyone working on the site. Should any non-compliance with the EMPr take place, the ECO must communicate this with the party responsible for the non-compliance as well as the contractor. If the non-compliance continues after written request by the ECO to rectify the situation, the ECO must inform the local or provincial environmental authority in writing. Should any issues arise on the site of an environmental nature or concern, the ECO will be responsible for taking the appropriate action.

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e. The Local/Provincial Environmental Authority as well as the Department of Mineral Resources & Energy

- The local/provincial Environmental Authority responsible for taking action against any non-compliance with the EMPr by the Applicant, the Contractor or any of his/her sub-contractors. The Local/Provincial Authority can request a compliance audit to be undertaken on the site at any time during the development or operational phase of the project.

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(c) EMERGENCY PROCEDURES

The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include, but are not limited to, fire, spills, criminal activities, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc. The contractor must ensure that lists of all emergency telephone numbers/contact persons (including fire control) are kept up to date and that all numbers and names are posted at relevant locations throughout the duration of the construction period and that all managers and team leaders know them.

- **Fires**

The contractor must take all reasonable measures to ensure that fires are not started as a result of operation activities on site, and shall also ensure that their operations comply with the Occupational Health and Safety Act (Act No. 85 of 1993). The contractor shall ensure that there is basic fire-fighting equipment available on site at all times and regularly serviced. The contractor shall appoint a member of his staff to be responsible for the installation and inspection of this equipment. The contractor is to ensure that he/she has the contact details of the nearest fire station in case of an emergency. No open fires are permitted on site unless in a designated areas for braais and so on. Sparks generated during welding, cutting of metal or gas cutting can result in fires. Every possible precaution shall therefore be taken when working with this equipment near potential sources of combustion. Such precautions include having an approved fire extinguisher immediately available at the site of any such activities.

- **Safety**

The contractor must ensure that his employees comply with the Occupational Health and Safety Act (OHSA) (Act No. 85 of 1993). All reasonable measures must be taken to ensure the safety of all personnel on site. The contractor must ensure:

- Compliance with the Occupational Health and Safety Act (Act No. 85 of 1993);
- That all reasonable measures are taken to ensure the safety of all site staff;
- That all construction vehicles using public roads are in a roadworthy condition, that drivers adhere to the speed limits and that their loads are secured and that all local, provincial and national regulations are adhered to.
- That all accidents and incidents are recorded and reported to the ECO.
- Provision of first aid facilities at all times and in line with the requirements of Construction Regulations.
- Relevant Personal Protective Equipment (PPE)/clothing is provided to all personnel on site at all times.
- All accidents and incidents shall be recorded and reported to the Safety officer on site.

The contractor is to ensure that he/she has the contact details of the nearest emergency rooms (hospitals) to the site, of both private and public hospitals.

(d) CONSTRUCTION SITE

- **Restriction to Working Areas**

Working areas are defined as those areas required by the contractor to undertake the works. It is important that activities are conducted within a limited area so as to facilitate control and to minimise the impact on the existing natural environment.

- **Access Roads**

No any other access routes must be constructed. Only by-pass where necessary; shall be constructed during development of additional structures and operational phase of the project. Operational vehicles/equipment must be limited to approved access routes and areas on the site so as to minimise excessive environmental disturbance to the soil on site.

- **Refuse and Waste Management**

The contractor shall be responsible for the establishment of a waste management methods and removal system that prevents the spread of waste/refuse within and beyond the construction camp. The contractor shall make provision of waste collection facilities to collect for waste prior disposal and shall make arrangements for disposal thereof. Refuse refers to all solid waste, including construction debris (cement bags, wrapping material, timber, cans, wire, nails, etc), waste and surplus food, food packaging, organic waste etc. The contractor shall be responsible for the establishment of a refuse control and removal system that prevents the spread of refuse within and beyond the construction site.

The contractor shall ensure that all refuse is disposed of by him and his sub-contractors' employees in refuse bins which he shall supply and arrange to be emptied as and when required. These bins must be adequate in number and accessibility.

Waste shall be separated into recyclable and non-recyclable waste, and shall be further separated as follows:

- Hazardous waste, consisting of substances that may be harmful to the receiving environment, and therefore require precautionary measures when handled. Examples include (but not limited to) oil, paint, diesel etc;
- General waste, consisting of non-hazardous substances and substances that cannot be recycled. Examples include (but not limited to) construction rubble, excess construction materials that cannot be reused, and food waste.
- Reusable construction material, which can be used at other construction sites.
- Recyclable waste shall preferably be deposited in separate bins. Recyclable material includes paper, tins and glass. The contractor is advised that "Collect-a-Can" collect tins, including paint tins, chemical tins, etc. for recycling.

Refuse bins shall be watertight, wind-proof and scavenger proof and shall be appropriately placed throughout the site and shall also be conspicuous (e.g. painted bright yellow). Refuse must also be protected from rain, which may cause pollutants to leach out. Particular caution is to be exercised with regards to handling of hazardous waste, to ensure that it does not spill or leak from the waste collection containers. The utmost care must be taken to ensure that no waste is able to enter wetlands and/or dams on or near to the site. The contractor or the appointed Waste Removal Company shall truck refuse collected out of the construction site. Refuse must be disposed of at a Municipal registered landfill site, which is also approved of by the local authority. Refuse may not be burned or buried on or near the site.

The contractor shall provide cleaning services to clean up the contractors camp and construction site on a daily basis. These areas shall then be inspected by the contractor to ensure compliance with this requirement. A litter patrol around the construction area is to take place twice weekly to ensure that all litter is cleared up. The contractor shall be warned, in writing by the ECO, of any infringement and will be expected to clear the litter within 24 hours of the notification. The contractor will be responsible for removal of litter, which may wash into watercourse.

- **Ablution Facilities**

The contractor will be responsible for the provision of sanitation for the sub-contractors and their staff. A minimum of one (chemical) toilet shall be provided per 15 individuals. Toilets provided by the contractor must be easily accessible. All toilets must be located within the construction site. Should toilets be needed elsewhere, their location must first be approved by the ECO. The ECO is responsible for ensuring that all toilet structures are suitably located and comply with requirements stated below.

- The toilets shall be neat construction and shall be provided with doors and locks and shall be secured to prevent them from falling over.

- Toilets shall be placed outside areas susceptible to potential flooding or within drainage channels. Toilets may not be placed in close proximity to the watercourse or drainage line. The contractor shall supply toilet paper at all toilets at all times.
- Toilet paper dispensers shall be provided in all toilets. The contractor shall ensure that the labourers make use of the toilets provided.
- The contractor (or reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor shall ensure that the toilets are emptied on a weekly basis or as required.
- The contractor shall ensure that no spillage occurs when chemical toilets are cleaned and emptied. Any accidental spillage must be reported to the ECO and the client, and cleaned up immediately. The contractor shall ensure that the toilets are protected from vandals.

If the contractor (or reputable toilet-servicing company) fails to provide and/or maintain all site sanitation facilities in a clean and hygienic condition, the ECO may request the contractor to suspend work until the requirements have been met. Washing areas must be situated away from the watercourse, and the use of biodegradable soaps is recommended.

- **Eating Areas**

The contractor shall designate restricted areas for eating within the construction site. If fires are required for cooking purposes, they must be restricted to the construction camp and the location shall agreed upon by the ECO. The feeding, or leaving of food, for stray or other animals in the area is strictly prohibited.

- **Construction Vehicles and Machinery**

Site vehicles are only permitted within the demarcated construction camp, as required, to complete their specific task. All construction vehicles should be in a good working order to reduce possible noise pollution. On-site vehicles must be limited to approved access routes and areas (including turning circles and parking) on the site so as to minimise excessive environmental disturbance to the soil and vegetation on site. Servicing and maintenance of vehicles on-site shall be done at areas specifically restricted for such use.

- **Material Storage and Stacking**

Construction material and other building material may only be placed within the demarcated area, which must fall within the demarcated site. The contractor must, where possible, avoid stockpiling materials in vegetated areas that will not be cleared. Stockpiles of construction materials must be clearly separated from topsoil stockpiles in order to limit any contamination of the topsoil. Stockpiles must be located away from sensitive hydrological features (including but not limited to, watercourses, drainage channels, areas susceptible to erosion etc.).

- **Fuel and Chemical Management**

The following shall apply when storing fuel and chemicals on site:

- The contractor shall ensure that fuels and chemicals (e.g. drums of fuel, grease, oil, brake fluid etc) are stored and handled carefully so as to prevent spillage. These liquids shall be confined to specific and secured areas within the contractor's camp and shall be clearly marked. Should the contractor intend to store such goods with a capacity of more than 80m³, an application for Environmental Authorisation must be submitted to the Limpopo Department of Economic Development, Environment and Tourism.
- The liquids will be stored in a bunded area with adequate containment (at least 1.5 times the volume of the fuel) with an impermeable floor beneath them for potential spills or leaks, in such a way that does not pose any danger of pollution even during times of high rainfall.
- In addition, the contractor must ensure that workers do not smoke or take part in any activity that may result in sparks in the vicinity of fuels and other flammable substances to prevent ignition. Relevant signage should be displayed at this points e.g. No smoking, flammable etc.
- Refuelling of vehicles shall only take place at a predetermined area, where adequate measures are in place to prevent spillage or pollution.
- The contractor will be responsible for ensuring that any party delivering potentially dangerous chemicals and oil to site is aware of the appropriate storage and drop-off locations and procedures. Transfer of hazardous chemicals and other potentially hazardous substances must be carried out so as to minimise the potential leakage and prevent spillage onto the soil.

- **Equipment**

Drip trays must be put in relevant locations (inlets, outlets, points of leakage, etc) so as to prevent such spillage or leakage during transfer. The contractor shall stand any equipment that may leak, and does not have to be transported regularly, on watertight drip trays to catch any pollutants. The drip trays shall be of a size that provides at least 1, 5 times the total potential spillage. Drip trays shall be cleaned regularly and shall not be allowed to overflow. Substances, which cannot be reused, must be disposed of according to the relevant waste disposal procedure. While all equipment must be serviced or repaired in a designated area

- **Spill Procedure**

- The contractor shall keep the necessary materials and equipment on site to deal with spillage of the relevant hazardous substances present on site. The contractor shall set up a procedure for dealing with spills, which will include notifying the ECO and the relevant authorities immediately following the spillage event. In the event of a spill, appropriate steps must be undertaken to prevent pollution. The clean-up of spills caused as a result of the construction activities, and any damage to the environment, shall be for the contractor's own account. A record must be kept of all spills and the corrective action taken.

(e) ENVIRONMENTAL MANAGEMENT OF CONSTRUCTION ACTIVITIES

Construction works and associated activities might have impact on the receiving environment. Such effects may include but not limited to; impact on surface water and ground water, vegetation, soil etc. This part of the report serves to explain measures that must be applied to prevent, reduce/limit, eliminate or compensate for environmental impacts to an acceptable level. Contractors and employees should adhere to the conditions as set out in this EMPr.

(a) Working Hours

Working hours for all operations shall be limited for 24 hours during weekdays (Monday to Friday, but may be extended to Monday to Sunday if needs be). Any deviations to these working hours must be cleared with the ECO, Site supervisor and the Oversight committee prior to implementation of the subject operations.

(b) Heritage Sites and Features

No archaeological or heritage sites have been uncovered on this site. Should such features be uncovered during construction, work must be halted immediately. Old burial grounds (if found) will be reported to the ECO who will advise the contractor as to the mode of action, which will include informing either the South African Police Service (SAPS) and/or a representative from the Limpopo Heritage Resources Authority (LIHRA).

From a heritage perspective supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. The foot print impact of the proposed mining development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds.

(c) Natural Features

Trees and natural vegetation, or any other natural features outside the work area, which will not be cleared for construction purposes, shall not be defaced, painted for benchmarks or otherwise damaged, even for survey purposes. This can only be done if agreed to by the ECO. Any feature defaced by the contractor shall be reinstated by the contractor to the satisfaction of the ECO.

(d) Soil Management

Top soil shall be removed from areas where physical disturbance of the surface will take place. The soil shall be stored and adequately protected from any pollution and erosion either by wind or water. The contractor shall temporarily stockpile excavated materials (e.g. soils and rocks) and construction materials in such a way that the spread of materials is minimised. The following measures must be applied when stock piling:

- The stockpiles must not be higher than 2m to avoid compaction and dispersed by wind
- All stockpiled material must be easily accessible without any environmental damage.

- The stockpiles may only be placed within the demarcated areas the location of which must be approved by the site Environmental Officer (EO) or ECO (As applicable).
- It is suggested that the stockpiles be placed on the already disturbed areas of the site. The contractor must, where possible, avoid stockpiling materials in vegetated areas that will not be cleared.
- Stockpiles are to be stabilised if signs of erosion are visible.
- Soils from different horizons must not be stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material.
- Topsoil stockpiles must be monitored for invasive exotic vegetation growth. Contractors must remediate as and when required in consultation with the EO, RE and ECO (As applicable).
- Stockpiles of construction materials must be clearly separated from topsoil stockpiles in order to limit any contamination of the topsoil.

(e) Pollution Control

Pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, wastewater containing organic kitchen waste, detergents, solid waste, litter and other such substances. The following measures must be implemented to prevent possible pollution"

- The contractor shall ensure that water/rainwater does not run into areas containing oil, diesel and other such substances as this could result in a pollution threat to sensitive environmental areas.
- Fuel tanks must be placed in designated areas with concrete walls, collection trays and fire extinguishers. Any spillage of fuel, oils, sewage resulting in soil contamination shall be cleaned up at the expense of the polluter.
- Used fuels/oils hydraulic fluids, paints solvents and grease must be stored in drums or suitable containers and must be disposed off at an appropriate site or sent to a local recycling plant.
- Never allow any hazardous substances to soak into soil.

Run-off from the site itself must be free from oil, waste and litter before joining the stormwater system. This must be ensured by securing any containers containing hazardous substances, in order that it cannot enter runoff, and by cleaning up any refuse and construction material from the site on a regular basis.

(f) Waste and Refuse Management

During construction phase, waste will be generated. These include solid wastes such as papers, food and beverage tins and containers. Wastes lead to unsightly landscape/environment. Substantial impacts on the environment can occur due to litter, fuel, accidental release of hazardous materials and chemical spillage during construction phase of the proposed development. Excessive accumulation of waste around construction site may create untidy conditions.

- The contractor shall ensure enough waste collection facilities are available on site for collection of waste prior to disposal. He/she must ensure that all refuse is disposed of by him/her and his sub-contractors' employees in refuse bins supplied and arrange to be emptied on a weekly basis.

- Bins must be adequate in number and accessibility. Refuse bins shall be watertight, wind-proof and scavenger proof and shall be appropriately placed throughout the site. Refuse must also be protected from rain, which may cause pollutants to leach out.
- All solid and chemical wastes that are generated during construction must be removed and disposed of at a licensed waste disposal site. Chemical containers and packaging brought onto the site must be removed.
- Waste shall be separated into recyclable and non-recyclable waste, and shall be further separated as follows:
    - Hazardous waste, consisting of substances that may be harmful to the receiving environment, and therefore require precautionary measures when handled. Examples include (but not limited to) oil, paint, diesel etc;
    - General waste, consisting of non-hazardous substances and substances that cannot be recycled. Examples include (but not limited to) construction rubble, excess construction materials that cannot be reused, and food waste;
    - Reusable construction material, which can be used at other construction sites;
    - Recyclable waste shall preferably be deposited in separate bins painted in different colours. Recyclable material includes paper, tins and glass.

The contractor or the appointed Waste Removal Company shall truck refuse collected out of the construction site. Refuse must be disposed of at a DWS registered site, which is also approved of by the contractor and the local authority. Refuse may not be burned or buried on or near the site.

(g) Noise Nuisance

Due to the locality of the development, operational activities are likely to cause noise nuisance to the surrounding farmers. Probably the two most important concepts in the regulation of noise are those of disturbing noise and noise nuisance.

- A disturbing noise is one that exceeds the zone sound level[1] set by the local authority.
- A noise nuisance means any sound, which disturbs or impairs or may disturb or impair the convenience or peace of persons.

Some of the activities that could constitute a noise nuisance are power tools, driving, loading and hooters. All of these elements could be connected with construction activities. The contractor must obtain and familiarise him/herself with any regulations and municipal by-laws regarding noise and must ensure that he/she abides by these regulations at all times. It is recommended that the following measures be implemented to keep noise levels down:

- The contractor may not use sound amplifying devices on site, unless in emergency cases;

- No work is to be done on holidays unless necessary, working hours must be strictly adhered to (*The operational schedule must be strictly adhered to. Work hours during the construction phase shall be strictly enforced unless permission is given).*
- Construction activities should be limited to normal working hours. Should normal working hours extend into evenings and weekends, community dwellers should be timorously informed of the dates and the times of such activities. Noisy activities shall take place only during working hours.
- Construction vehicles and machinery must be kept in good order so not to cause excessive noise, Were possible the contractor must use equipment designed to limit noise levels;
- Employees exposed to high level of noise must be provided with ear protection gear.
- During construction, all reasonable precautions must be taken to minimise noise generated on site, especially when carrying out activities that may impact on neighbouring landowners and users. Every effort must be made to limit exceedingly noisy activities.

Noise reduction is essential and the contractor shall endeavour to limit unnecessary noise. The use of silent compressors is a specific requirement. The ECO must inform I&APs in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the adjacent sites. These activities could include, but are not limited to, blasting (***if required***), use of pneumatic jack-hammers and compressors, bulk demolitions, etc.

(h) Air Quality

The contractor must take appropriate and reasonable measures to minimise the generation of dust as a result of his works, operations and activities. Additionally fumes from construction vehicles and machinery could contribute to air pollution if not addressed properly. Particular attention must be given to prevent dust generation during excavation and stockpiling and transportation activities. The contractor is responsible for informing his/her sub-contractors and their employees to report any excessively dusty conditions to the contractor, the EO or the responsible representative. Corrective and preventative measures shall include but not be limited to:

- Regular (*at least daily during dry and windy seasons*) and effective treatment of working areas using water sprays and appropriate scheduling of dust-generating activities (*potable water cannot be used as a means of dust suppression, alternative measures must be sourced*);
- Covering for all load beds when transporting;
- The construction camp shall be watered during dry and windy conditions to control dust fallout.
- Concrete bags must not be allowed to blow around the site and spread cement dust.
- All construction vehicles and machinery shall be in good order and serviced regularly to avoid releasing excessive emissions to the atmosphere.

(i) Erosion Control

The disturbance of steep slopes, for example by the removal of vegetation, may result in slope instability and erosion by rain and surface runoff. All slopes that are disturbed during construction shall immediately be stabilised to prevent erosion. Where re-vegetation of slopes is undertaken, this shall be

done in accordance with the landscape architect (or appointed landscaper). The contractor must take reasonable measures to prevent erosion caused by their works. Erosion control measures must be in place in areas where runoff concentrates, in order to detain the sediment load and slow down the runoff. Erosion controls must be put in place on all drainage channels that drain into hydrological features. These measures may include, but not be limited to:

- silt fences;
- brushwood; and
- Rows of sawdust-filled onion bags.

Runoff containing high sediment loads shall not be released directly into natural or storm water drainage systems or nearby hydrological features. Any erosion that occurs during a heavy rainfall event must be remediated at the expense of the contractor. This will include clean-up of the silt deposited and filling up of erosion channels that may form. The contractor shall be responsible for rehabilitating all eroded areas in such a way that the erosion potential is minimised after construction has been completed. Storm water shall be delivered away from all construction or site areas in cut-off drains. The contractor shall ensure protection of areas susceptible to erosion by installing temporary or permanent structures such as meter drains, drainage pipes, sandbags, gabion mattresses etc.

(j) Excavations, Trenching and Backfilling

All excavations for any purpose must be preceded by selective striping and stockpiling of topsoil for rehabilitation purposes of affected areas. Temporary stockpiles shall be done in a manner which will avoid erosion.

- Excavated areas must be barricaded to warn personnel of associated dangers.
- Rehabilitation should be progressive with construction and not left until the end of the project where possible.
- The contractor shall temporarily stockpile excavated materials (e.g. soils and rocks) and construction materials in such a way that the spread of materials is minimised. The stockpiles must not be higher than 2m to avoid compaction.
- The contractor must avoid vegetated areas that will not be cleared. It is suggested that the stockpiles be placed on the already disturbed areas of the building site. Stockpiles are to be stabilised if signs of erosion are visible.
- Soils from different horizons must not be stockpiled such that topsoil stockpiles do not get contaminated by sub-soil material.

(k) Public Safety

As per the Traffic Impact Assessment (TIA) Report, the traffic counts and analysis thereof have indicated that the existing road network within the study area is operating at well below its capacity and at a good Level of Service with all movements operating at a Level of Service B or better. Calculations of traffic generation showed that the construction phase and the operational phase of the proposed project will generate low volumes of traffic during the morning and afternoon peak hours, that is, less than 60 km/hr.

More recommendations were stipulated on page 32 of the TIA report. It should also be noted that the access to the farm can currently only be gained through the Farm Langebaan 89LR which is private owned farm and only then after the permission has been granted in writing that the access can be obtained.

Appropriate measures shall be in place to warn I&AP's (including community personnel and residence as well as any person(s) visiting the premises) interested and affected parties of the dangers during construction. Flagmen and women shall be deployed at any intersection to regulate passage and movement of traffic vehicles. Appropriate signage and information shall be displayed where necessary to warn the public of associated dangers. Speed limit shall be adhered to at all times to avoid accidents at by construction personnel and other road users during construction.

ii) MANAGEMENT AND MONITORING

It is recommended that monthly audits be undertaken by an independent EAP. These environmental audits will ensure that environmental commitments are adhered to and will be used to evaluate the effectiveness of the mitigation measures. The following measures will be undertaken:

- Any accident or incident as a result of this project shall be reported to the Safety Officer/ECO/Contractor as well as to the site supervisor immediately.
- The Project Manager will be responsible for inspection during construction phase of the project to ensure that the appropriate measures are implemented.
- In the event of an environmental emergency, the site supervisor will inform the contractor to stop work on the offending activity until the matter is resolved.
- The Project Manager by use of a site environmental officer will oversee each phase of construction, be responsible for all environmental inspection matters and will:
    - Ensure that project-related activities are in compliance with the EMP, contingency plans, contract provisions or specifications during construction.
    - Ensure that any mitigation and environmental remediation measures required to protect the environment upon ceasing work follow the environmental regulations.
    - Be responsible for addressing on-site environmental issues as they emerge.
    - Record instances of non-compliance, contingency response and work stoppage relating to environmental issues. Maintain records of all communication.
    - Maintain a photographic record of prior to and during construction activities that have the potential to adversely affect natural resources.

The appointed ECO as well as the contractor and his/her sub-contractors on site are responsible for ensuring compliance with conditions of the EMP. It is suggested that periodic (**monthly**) EMPr compliance reports/audits are compiled by the ECO and submitted to the contractor for his/her review and correction of non-compliance issues. It is the responsibility of the ECO to report any non-compliance, which is not correctly rectified to the NW-Rural, Environment and Agricultural Development.

Interested and Affected Parties must be allowed access to the EMPr document. They have the right to monitor specific aspects of the EMPr (e.g. ***noise regulations, working hours stipulated***) in conjunction with the contractor in a reasonable and formal manner, without unreasonably disrupting construction activities. The ECO, or a designated person involved with environmental issues on the project, shall attend the progress and/or site meetings on a regular basis to provide feedback on any outstanding or contentious environmental matter. No member of the public may including students and or university personnel may enter the construction site without prior approval from the safety officer/contractor.

The contractor shall keep a record of all complaints received from the community and communicate them to the ECO. These complaints must be addressed and mitigated within reasonable time. Records relating to the compliance/non-compliance with the conditions of the EMPr as well as audit reports shall be kept in good order and shall be made available to nearby communities when requested, Environment and Agricultural Development on request. In the event of non-compliance, the following measures shall be enforced:

- The ECO may order the contractor to suspend part or all of the works if the contractor causes damage to the environment by not adhering to the specifications set out below.
    - Such suspension will be enforced until such time as the offending parties' actions, procedure and/or equipment are corrected.

(a) Rehabilitation

- After construction, any area cleared or disturbed (as a result of the construction activities) within and outside the boundaries of the construction site shall be rehabilitated. The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the contract and where necessary and appropriate, the ground scarified, topsoil restored and indigenous vegetation re-established.

All construction equipment and excess aggregate, gravel, stone, concrete, bricks, temporary fencing and the like shall be removed from the site upon completion of the work. No discarding of burying of materials of whatsoever nature shall be allowed on the site, or on any vacant or open land in the area. Such materials may only be disposed of at the appropriate registered waste disposal site.

(b) General Conduct

Each member of the work force shall be subjected to a project orientation period prior to commencing work on the site. The orientation shall include a discussion on environmental matters of concern on this project. The ECO, with the assistance of the contractor, shall communicate all aspects of the EMPr to the site staff (i.e. site agents to labourers) prior to commencement of excavation or any other environmentally disturbing activity. Basic environmental awareness training must be carried out for all employees *(it is suggested that this be conducted in a language best understood by all employees)* and should be included in safety training.

A copy of the EMPr must always be made available on site. General waste such as food wrapping and sanitary waste shall be confined to the work site and collected daily for appropriate disposal at an approved municipal landfill. Construction waste such as rubble shall be gathered up for disposal at an

approved location. No waste is to be burned or disposed of on-site and construction personnel are required to confine their activities within the approved work site. It should be emphasized that the Environmental Practitioner shall be given the responsibility to inventory all the environmental aspects of the operation. Such responsibilities are to include the following:

- Documentation of specific environment-related activities, such as lists of fuel spill incidents.
- Ensuring that project related activities comply with contingency plans, regulatory permits and approval conditions, as well as contract provision or specifications.
- Providing environmental information for staff, and ensuring that all personnel and contractors understand the terms and conditions outlined in all regulatory permits and in the Management Plan.
- Maintaining the required records for environmental monitoring programs.
- Maintaining a photographic record of prior to, and during construction activities that have the potential to affect environmental resources in an adverse manner.
- With the current Covid-19 pandemic, sanitizing and taking of temperature must be done and where a case is reported, the relevant people must isolate and be removed from site immediately.

m) Final proposed alternatives.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

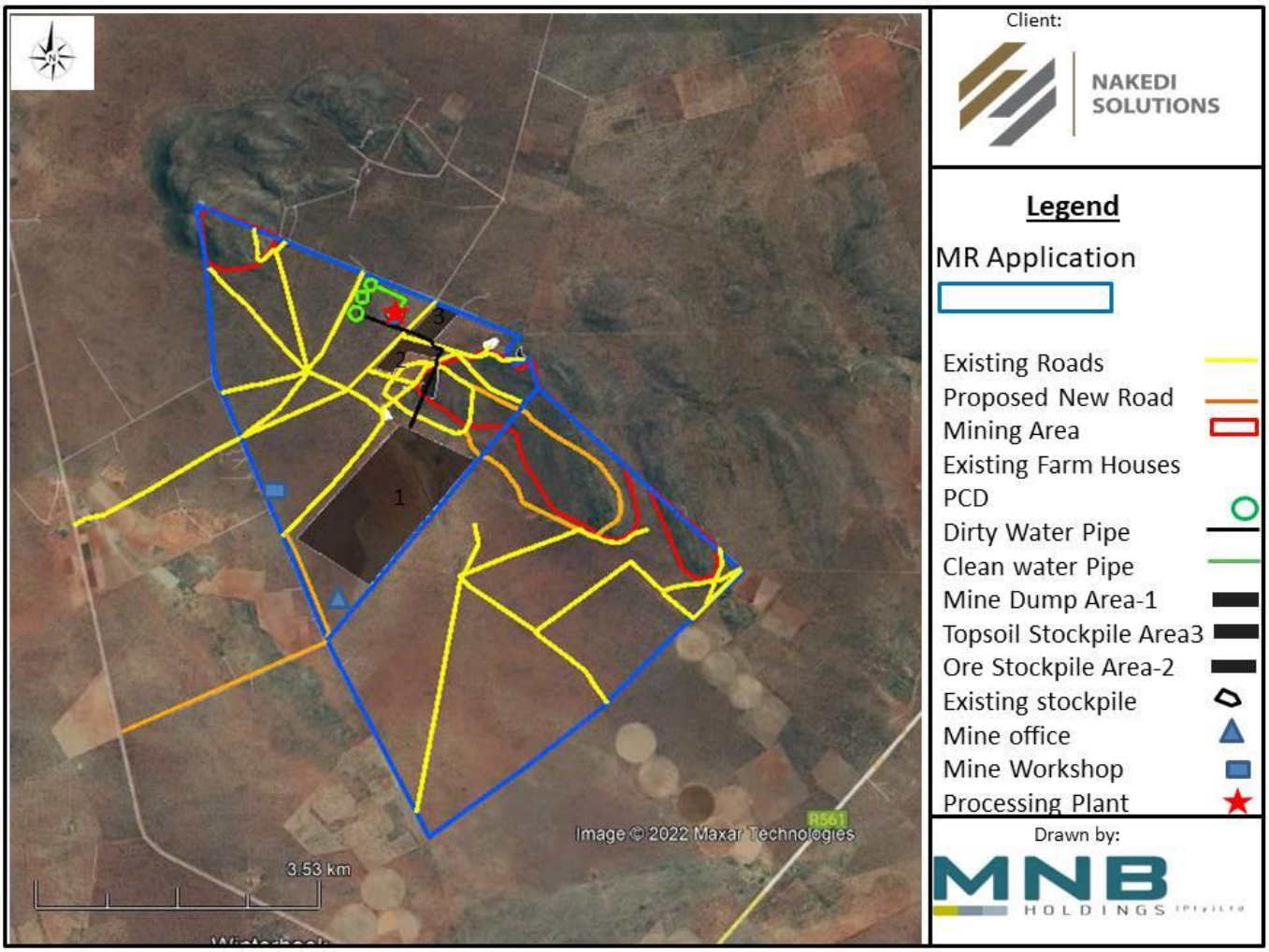


Figure 37: Final proposed alternative Map

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

Due to the fact that the layout design is conceptual it is expected that the knowledge gaps for the project at hand (and therefore aspects where information may be considered insufficient) revolve around exact designs, and in some cases, locations. Therefore the following conditions of authorisation are proposed:

- The environmental authorisation will be subject to the availability of an approved water use license or proof that the said application process is underway.
- A detailed paleontological study report should be submitted to both SAHRA and DMRE for assessment and record keeping.
- Detailed designs of the associated water management infrastructure (silt trap, berms, trenches, pumps, etc.) must be compiled in line with recommendation made by DWS, the Visual Study and

the Flora Assessment. The final as-built designs will be provided to the competent authority for record keeping purposes once construction has been completed.

- The exact locations of the proposed infrastructure may still need to be moved in the future. Any such infrastructure must be confined to the dirty water management area. Prior to and after completion of construction of any such infrastructure, the Competent Authority should be informed of the location thereof for record keeping purposes.
- The timing around when the water treatment plant will be commissioned as well as the designs will need to be submitted to the provided to the DMRE who are the competent authority for record keeping purposes.
- Employ soil erosion control measures, such as protection berms, where necessary to minimize soil erosion;
- Rehabilitate all slopes and degraded areas before the onset of the rainy; season. Use topsoil as much as possible in these areas;
- Develop procedures to minimize surface water run-off and soil erosion; and
- Area could be re-vegetated with cuttings of indigenous plants from the surrounding area.
- Clearing Activities and Monitoring of the area for alien invasion.
- Vegetation which has been cleared should be removed from the site and disposed of as waste.

o) Description of any assumptions, uncertainties and gaps in knowledge.

(Which relate to the assessment and mitigation measures proposed)

Due to the brief nature of the site visits conducted at the study area, this assessment is based largely on our understanding of the physical and ecological setting based on available literature and based on information that has been gathered in the life span of the mining and during the rehabilitation process as well as other Mining Rights and projects done and reviewed.

- Please refer below for the list of assumptions and limitations forming part of this report:

Impacts and assumptions made with regards to the Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR ore bodies and associated infrastructure (haul road, stockpile area etc.) are made on the current status quo of the area.

- ❖ Final designs for the conveyor system were not available at the time of assessment.

Visual Impact Assessment:

- In order for the VIA to be conducted, a maximum height of 15m was assigned (as provided by Nakedi Solutions) to the proposed mine. Furthermore, vegetative cover was not taken into account in the generation of the Digital Elevation Model (DEM) which implies that the visual impact illustrates the worst case scenario;

Air Quality Impact Assessment:

- The air quality impact associated with the roads were modelled as an exaggeration of actual conditions due to a number of factors namely; the roads where modelled as not being wetted and the EPA emission factor over exaggerates emissions. Therefore the emissions predicted for the development of the proposed Nakedi Solutions Mine illustrates the worst case scenario;
- Wet deposition has not been modelled as part of this assessment, therefore implying that the effects of atmospheric scrubbing from precipitation have not been simulated;

Heritage Impact Assessment:

- The assessment was influenced by the unpredictability of buried archaeological remains and the difficulty in establishing intangible heritage values. Archaeological deposits usually occur below the ground level. Should any artefacts or skeletal material be revealed during construction, then all activities will need to be halted and the competent be notified;
- The field survey did not include any form of subsurface inspection beyond the inspection of burrows, road cut sections, and the sections exposed by erosion or field ploughing. The proposed mining infrastructure will be limited to specific right of corridors as detailed in the development layout;
- The construction team will need to provide link and access to the road servitude, where service sites will use the existing access roads;
- No excavations or sampling were undertaken, due to the fact that a permit from heritage authorities is required to disturb a heritage resource. As such, the results of the assessment are based on indicators observed on surface. Furthermore, the study did not include any ethnographic and oral historical studies nor did it investigate the settlement history of the area and no heritage artefacts or graves were noted

Noise Impact Assessment:

- The quantification of sources of noise was restricted to activities associated with the applied Mining Right area ore bodies, overburden dump areas, haul roads, crusher and conveyor system. Routine noise impacts from operations were estimated and simulated.

p) Reasoned opinion as to whether the proposed activity should or should not be authorised

i) Reasons why the activity should be authorized or not.

- The factors taken into consideration when assessing whether authorisation should be granted or note the need and desirability, positive impacts and impact management measures needs to be weighed up against the identified potential negative impacts, to see whether the benefits of the project could justify the negative impacts.
- It is the EAP's opinion that the majority of impacts will have medium significance before mitigation. However, the loss in habitat has a high severity even post closure. It is recommended that if clearances should be kept at a minimum and relevant permits be applied for as well as

potential replanting, re-seeding and nurseries of indigenous and protected species form part of the mitigation measures.

With the extensive specialist information generated to establish the baseline environmental conditions of the project area the EAP recommends that the activity be authorised subject to all relevant legislation.

It has been illustrated that with the implementation of the proposed mitigation measures and EMPr, all identified environmental impacts can be mitigated to acceptable levels, thus allowing the proposed development to proceed. All impacts associated with alternative can be mitigating to constitute an overall significance of very-low negative post mitigation.

Based on the information provided above, it is the EAP's recommendation that the proposed development be authorised by the Department with the implementation of site alternative 1 (priority area) and associated mitigation measures forming part of the EMPr.

ii) Conditions that must be included in the authorisation

Employ soil erosion control measures, such as protection berms, where necessary to minimize soil erosion;

- Rehabilitate all slopes and degraded areas before the onset of the rainy; season. Use topsoil as much as possible in these areas;
- Develop procedures to minimize surface water run-off and soil erosion; and
- Area could be re-vegetated with cuttings of indigenous plants from the surrounding area.
- Clearing Activities and Monitoring of the area for alien invasion.
- Vegetation which has been cleared should be removed from the site and disposed of as waste.
- Rehabilitate the area
- No new NEMA, NEMWA, NWA listed activity which is not included in this application may not be undertaken without prior legislative authorisation.
- Annual environmental reports should be submitted to the department including water monitoring reports.
- An EMP Performance Assessment must be undertaken every two years by an external, independent, suitably qualified person. A copy of the Performance Assessment report must be submitted to the DMR.

Based on the information obtained as part of the environmental impact assessment and associated mitigation measures, the EAP considers Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR to be the preferred site alternative for the project as it allows for the various benefits associated with the project to be realised whilst at the same time having the smallest impact on the receiving environmental conditions.

A variety of potential negative environmental impacts have been identified for the project which relates to nuisance factors (air, noise, traffic, visual), water quality degradation, loss of habitat, destruction of heritage resources, as well as a potential for increased spread of diseases. It should however be noted

that with the implementation of the proposed mitigation measures the overall significance of the negative environmental impacts will range between low to very-low negative.
Based on the information provided above, the EAP recommends that the development proceed with being the preferred alternative along with the effective implementation of all mitigation measures provided as part of the EMPr.

Annual environmental reports should be submitted to the department including water monitoring reports.

- An EMP Performance Assessment must be undertaken every two years by an external, independent, suitably qualified person. A copy of the Performance Assessment report must be submitted to the DMR.

(1) Specific conditions to be included into the compilation and approval of EMPr

Mining will commence on the applied parts of Farm Baden 90LR and Portion of portion 0 of the farm Bronkhorsfontein 42LR and any other mining that will happen anywhere else will require a Section 102 which will ultimately also requires authorisation
Based on the information provided above, it is the EAP's recommendation that the proposed development be authorised by the Department with the implementation of site alternative 1 and associated mitigation measures forming part of the EMPr.

(2) Rehabilitation requirements

(c) Rehabilitation

- After operation, any area cleared or disturbed (as a result of the operational activities) within and outside the boundaries of the construction site shall be rehabilitated. The contractor shall be responsible for cleaning the contractor's camp and construction site of all structures, equipment, residual litter and building materials at the end of the contract and
- Where necessary and appropriate, the ground scarified, topsoil restored and indigenous vegetation re-established.

The concurrent rehabilitation requirements are as follows:

- All open pit areas should be rehabilitated as soon as the mining in that section has been
- finalised;
- Slopes of rehabilitated areas must be gentle sloped to minimise loss of topsoil due to erosion of topsoil;
- Re-vegetation of rehabilitated areas must be done immediately;
- Rehabilitated areas must be free-draining;
- Rehabilitation activities must be actively monitored on a regular basis to ensure the long-term sustainability thereof; and

- An Environmental Management Plan should integrate a Rehabilitation Plan that should be compiled as part of management action should there be species of ecological importance that will require rescue & replanting and faunal species removal and relocation.
- The rehabilitation and closure objectives should be implemented as described i
- Rehabilitation Plan and Final Closure.

q) Period for which the Environmental Authorisation is required.

It is currently anticipated that the Life of Mine will be a period of 30 years therefore an Environmental Authorisation is required for that time, after which it can be renewed.

r) Undertaking

(Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.)

Herewith I, **(Mantsepuoa Bolofo),** the person whose name is stated in the report, confirm that I am the person authorised to act as representative of the applicant in terms of the resolution submitted with the application, and confirm that the above report comprises EIA and EMPr compiled in accordance with the guideline on the Departments official website and the directive in terms of sections 29 and 39 (5) in that regard, and the applicant undertakes to execute the Environmental management plan as proposed.

s) Financial Provision

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation**.**

The value of the financial provision that will be required to rehabilitate the environment in respect of rehabilitation, including the proposed mining activities was determined to the value of R 2 953 935 in the final EIR prior to submission thereof to the Competent Authority. It is further noted that this amount will annually increase as the activity increases in foot print in the area

R2 953 935

i) Explain how the aforesaid amount was derived.

Operational rehabilitation has been catered for in the Budget lodged with the application in the Mining Works Programme. In terms of decommissioning rehabilitation (Rehabilitation Quantum which is derived from the DMRE quantum calculation template) the amount to be provided by Bank Guarantee or cash deposit is **R2 953 935.**

The amount is calculated using or from a few derivatives, mainly access roads, general rehabilitation (including borehole capping and sump and drill chips removal), fencing, maintenance and after care for 2-3 years, road rehabilitation as well as fencing.

It should be noted that the amount required to rehabilitate is not mainly based on the size of the mining but rather the activity and the rehabilitation to be conducted.

ii) Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme, Financial and Technical Competence Report or Prospecting Work Programme as the case may be).

Yes, the amount required for the financial provision will be provided in the form of a bank guarantee or a direct EFT into a rehabilitation trust.

t) Deviations from the approved scoping report and plan of study.

i) Deviations from the methodology used in determining the significance of potential environmental impacts and risks.

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

The financial provision for the rehabilitation in terms of this closure plan will be set aside using the closure cost assessment framework provided for by the Department of Mineral Resources & Energy. The master rates used in the assessment are the master rates provided by the DMRE and escalated annually with the CPI. A summary of the master rates is provided in **Annexure Quantum**.

Criteria of assigning significance to potential impacts

The assessment of impacts is largely based on DEA (1998) Guideline Document: EIA Regulations (see impact assessment methodology). The assessment will be done for impacts arising from the planning, construction and operation phases of the proposed development, both before and after the implementation of appropriate/recommended mitigation measures. Impacts will be assessed according to the criteria outlined in this section. Each impact will be ranked according to its extent, duration, magnitude (intensity) and probability. From these criteria, a significance rating is obtained, the method and formula is described below. Where applicable, migratory recommendations have been made and are presented in tabular form (see example below).

Status of Impact

The impacts are to be assessed as either having a:

- negative effect (i.e. at a `cost' to the environment),
- positive effect (i.e. a `benefit' to the environment), or
- neutral effect on the environment.

Extent of the Impact

(**1**) Site (site only),
(**2**) Local (site boundary and immediate surrounds)
(**3**) Regional,
(**4**) National, or
(**5**) International.

Duration of the Impact

- The length that the impact will last for is described as either:

(**1**) immediate (<1 year)

(**2**) short term (1-5 years),

(**3**) medium term (5-15 years),

(**4**) long term (ceases after the operational life span of the project),

(**5**) Permanent.

Magnitude of the Impact

- The intensity or severity of the impacts is indicated as either:

(**0**) none,

(**2**) Minor,

(**4**) Low,

(**6**) Moderate (environmental functions altered but continue),

(**8**) High (environmental functions temporarily cease), or

(**10**) Very high / unsure (environmental functions permanently cease).

Probability of Occurrence

- The likelihood of the impact actually occurring is indicated as either:

(**0**) None (the impact will not occur),

(**1**) improbable (probability very low due to design or experience)

(**2**) low probability (unlikely to occur),

(**3**) medium probability (distinct probability that the impact will occur),

(**4**) high probability (most likely to occur), or

(5) Definite / don't know.

Significance of the Impact

- Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.
- **S = (E+D+M) P**
- The significance ratings are given below:

(**<30**) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),

(**30-60**) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),

(**>60**) high (i.e. where the impact must have an influence on the decision process to develop in the area).

ii) Motivation for the deviation.

Section 24 (4) (b) (i) states that "[an] investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity [must be included]". No alternative sites were identified for the project.

u) Other Information required by the competent Authority

i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-

(1) Impact on the socio-economic conditions of any directly affected person. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The landowners will be directly affected by the mining activity as it will interfere with the current farming and game hunting eco-tourism activities on Farm Baden 90LR and Bronkorstfontein 42LR. The impacts that will affect the landowners include but not limited to:

- Loss of land capability where the open pits will be developed
- Loss of land where the roads and infrastructure will be constructed
- Increased noise and visual disturbances
- Loss of income from the loss of guests due to the change in the natural scenic environment
- Loss of indigenous vegetation and sensitive habitats
- Suffer losses due to increased criminal activity (poaching and potential stealing)

The financial losses due to the change in the land use at the farm will need to be compensated for by way of land use agreements with the legal occupiers or buying the farm. In order to mitigate specific risks of criminal activity to the directly affected and neighbouring landowners, it is recommended that:

- Fence off servitudes and access roads and provide for strict access control measures to service roads and patrol service roads regularly;
- Utilize sufficient mine security to regularly patrol the fences of the mine infrastructure, especially;
- Liaise with the South African Police Service (SAPS) to enhance police patrol activity in the project area;
- Support the community watch of the directly affected and neighboring landowners which can report criminal or suspicious activity; and
- Employment of local people on the mine to improve the poverty levels in the host and neighboring communities.

❖ **Identification of potential impacts**

Potential impacts per activity and listed activities.

- Socio-economic impacts
- Increased rehabilitation costs
- Bio-physical impacts
- Dust generation
- Noise nuisance
- Damage to service infrastructure

i) Potential cumulative impacts.

No cumulative impacts have been identified for any of the operational phases.

ii) Potential impact on heritage resources

Kindly note that this is an application for mining rights within an existing facility for the proposed project, based on the observations, no presence of any of the types and ranges of heritage resources in terms of the National Heritage Resources Act (No 25 of 1999) were observed on this site. However, the likeliness of such features occurring cannot be ruled out. In the event that such are uncovered, during this development, the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

iii) Potential impacts on communities, individuals or competing land uses in close proximity.

- *Dust nuisance*

Mining activities may contribute to dust nuisance to both livestock and humans. Though there are no receptors in close proximity to the mining area/borrow pit site, movement of hauling truck will contribute to generation of dust. Furthermore dust could affect the wellbeing of livestock in the neighbouring farms.

- *Risk of injury to public and animals*
- *Dust smothering of vegetation*
- *Possible introduction of alien species*

It is anticipated that unauthorised/uncontrolled access to the mining site could result in danger of falling and drowning or people and livestock/wild animals.

(1) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. **(**Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix** and confirm that the applicable mitigation is reflected

In terms of section 38 of the National Heritage Resources Act, 1999 (Act no. 25 of 1999), a comprehensive heritage impact assessment (HIA) investigation in accordance with the provisions of Sections 38(1) and 38(3) of the *said act* and focuses on the survey results from a cultural heritage survey. The HIA study was undertaken in order to establish if any localities of heritage significance were present on the property.

No sensitive areas were identified in the site, however:

- A Heritage report recommended for the construction phase when ground clearance commences. This task includes the presence of a qualified archaeologist to identify and assess any heritage resources that may be uncovered during ground clearance.
- Should chance archaeological materials or human burial remains be exposed during subsurface construction work on any section of the mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the LIHRA and NHRA regulations.

❖ **Potential impact on heritage resources**

Kindly note that this is an application for mining rights within an existing facility for the proposed project, based on the observations, no presence of any of the types and ranges of heritage resources in terms of the National Heritage Resources Act (No 25 of 1999) were noted to occur. However, the likeliness of such features occurring cannot be ruled out. In the vent that such are uncovered, during this development, the South African Heritage Resources Authority (SAHRA) should be notified immediately, all development activities must be stopped and an archaeologist accredited with the Association for Southern African Professional Archaeologist (ASAPA) should be notify in order to determine appropriate mitigation measures for the discovered finds. This may include obtaining the necessary authorisation (permits) from SAHRA to conduct the mitigation measures.

(2) Other matters required in terms of sections 24(4)(a) and (b) of the Act.

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix)**.

Section 24(4)(b)(i) of the NEMA (1998) states the following "*Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must include, with respect to every application for an environmental authorisation and where applicable investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity*"

The alternatives in terms of the project at hand have been identified and investigated in depth in this report. The following information regarding alternatives has been included in various parts of this EIR as indicated:

- The alternatives for the current layout plan were considered in detail with the aim to minimise impacts and protect natural resources.
- The project alternatives (including the no-project alternative) were identified and described,
- The positive and negative impacts of the proposed alternatives have been described,
- The risks associated with the identified alternatives have been described,
- A motivation where no alternative sites were considered was provided, and
- A statement motivating the alternative development location within the overall site was provided.

The alternatives, descriptions, motivations, assessments, etc have all been considered in detail in this report and are therefore not repeated here.

i) Waste Streams and Management

Key Waste Streams

The following waste streams might be generated at the proposed Iron Mine:

- General domestic waste (e.g. food waste, papers, plastics, glass, cans, garden waste, etc.)
- Sewage and sullage from the office, change house and workshop
- Separate overburden (soil & rock)
- Ore discard
- Spent oil and grease from mine workshops, as well as hydrocarbon containers
- Fluorescent tubes, old batteries, waste paints
- Scrap waste (scrap metals, empty chemical containers, and metal off-cuts)
- Wood waste (packaging material)
- Disused electronic equipment

The overburden and discard are mine residues falling within the ambit of hazardous waste requiring Authorisation under the National Environmental Management: Waste Act, 2008. Thus, the mining right application includes an integrated Environmental Authorisation and waste license application, which are running concurrently to the IWULA compilation process.

The listed activities requiring licensing are:

National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008): CATEGORY B

- **Storage of hazardous waste**

The storage of hazardous waste in lagoons excluding storage of effluent, wastewater or sewage.

- **Treatment of waste**

The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.

- **Disposal of waste on land**

The disposal of any quantity of hazardous waste to land.

- **Waste Management**

The hierarchy for waste management will be followed as outlined below.

- ***Waste prevention:*** the prevention and avoidance of the production of waste;
- ***Recovery:*** the recycling or re-use of waste;
- ***Waste reduction:*** the reduction of the volume/quantity or hazardous nature of waste during mine operation and production;
- ***Waste treatment:*** the treatment of waste to reduce the volume of waste, risk to human and the environmental, and the degree of hazard;
- ***Waste disposal/discharge/emission:*** the environmentally acceptable and safe disposal or discharge of waste in line with the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008).

Nakedi Solutions' Waste Stream Identification

Waste management at Nakedi Solutions mine will be guided by the hierarchy for waste management, which supports sustainable development through promoting sustainable and cleaner production, waste minimization, reuse, recycling and waste treatment. Disposal is regarded as a last resort, and practiced in an environmental sound and socially acceptable manner, and subject to the NEMWA and applicable regulations.

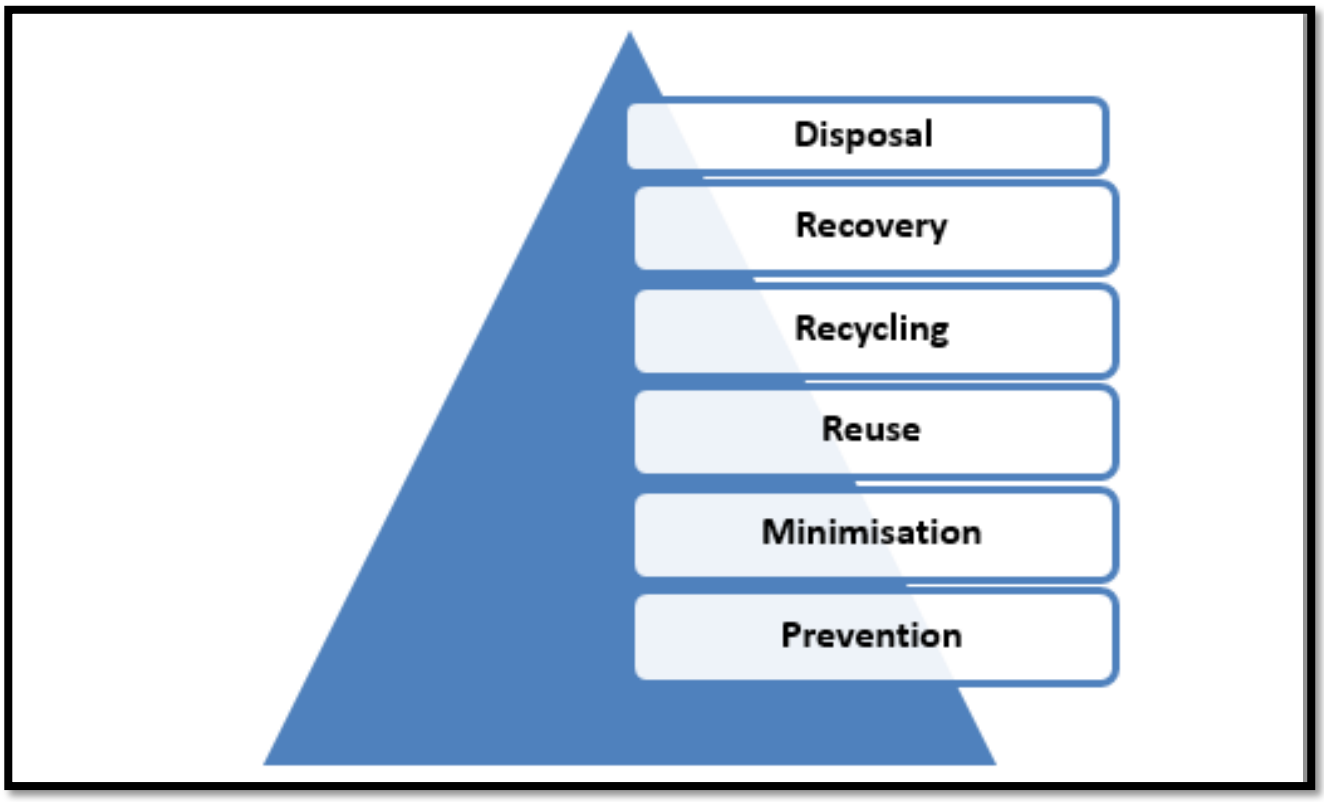


Figure 38: The Waste Management Hierarchy

Hazardous wastes such as chemical containers, spent oil, diesel and grease will be stored in dedicated containers and collected at regular intervals by a registered sub-contractor and disposed of at a licensed disposal site. No hazardous waste streams will be disposed of on the mine premises, except authorised under the NEMWA, e.g. in the case of Iron discard and slurry. Spillages will be cleaned up and disposed of in an appropriate manner.

Scrap material that have salvageable value will be collected, sorted and reused where possible.

However, if quantities of this waste stream are significant, Nakedi Solutions will work with local communities through the established structures in SLP programmes, to establish a local-based organisation to recover and sell or reuse the scrap metal.

General waste is collected in marked containers and removed from the premises by a registered contractor on a weekly basis. Safe disposal certificates will be retained for record-keeping, for all waste streams disposed off-site.

- **Waste Management**

The National Environmental Management Waste Act (NEMWA), 2008 (Act No. 59 of 2008) is the statutory regulator of all hazardous waste generated by any form of development. All waste (solid, liquid or gases) at Nakedi Solutions Mine will be managed in accordance with provisions and prescripts in the NEMWA and relevant Regulations. Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica will develop waste management procedures as part of the ISO 14001 Environmental Management Systems (EMS) for the operation. These procedures will outline steps to be followed during handling, storage, transportation and disposal or reuse of all waste streams emanating from the activities, products and services of the mine. These procedures will also give an overview of different types of waste generated within the mine and will classify these accordingly. Furthermore, it will provide provision for reclamation and recycling of waste.

- **Waste Separation and Handling**

General domestic waste will be disposed through a colour coded bin system at the proposed Nakedi Solutions mine for different types of material. Domestic waste and scrap metals will be collected in rubbish bins. All domestic waste, commercial waste, industrial waste, and other waste classified as General Waste under the South African Minimum Requirements for Waste Disposal by Landfill (DWS, 1998) will be removed from the site by an appropriate licensed water removal contractor and disposed of at a licensed general waste facility.

- **Hazardous Waste**

Hazardous waste such as grease, used oils, acids, fluorescent tubes, medical waste will be stored in containers at the mine. Care will be taken not to mix different hazardous chemicals within one container. Full, sealed hazardous waste containers will be removed from the site to the Temporary

Hazardous Storage Facility within 48 hours and once sizeable loads are attained, they will be dispatched to an authorized hazardous waste disposal facility. There are no known authorised hazardous waste disposal sites in Limpopo Province.

Safe Disposal Certificates will be obtained and kept in record at the mine. Recyclable hazardous waste such as oils will be collected by an authorised contractor such as Oilkol and Kia-Ora Oils for recycling purposes.

Raw sewage and grey water from the mine offices, change house facility including ablution, and workshops will be handled by a package sewage treatment plant. The sewage system will have capacity for 500 people and thus has sufficient capacity to also handle the increased demand for the mine. Effluent from the sewage treatment plant will be drained to the pollution control dam for reuse at the processing plant facility and dust suppression. In addition, chemical mobile toilets will be provided for at the mine workings and the raw sewage will be collected by authorised contractors for disposal into a licensed waste water treatment works. Safe Disposal Certificates will be obtained and kept in record at Nakedi Solutions' Mine.

- **Waste Management Facilities**
  - **Reclamation Yard**

This area will be used for separation of domestic or industrial waste to be converted into energy and reusable materials resulting in savings of natural resources. The area will be barricaded to ensure that there is no litter and upkeep at all times. Only recyclables non-hazardous waste will be brought to this area from the different sites on the mine for sorting purposes.

- **Hazardous Waste Storage Facility**

All hazardous waste generated on site will be temporarily stored at this facility. Hazardous waste will be removed by a contractor to a licensed off-site hazardous waste disposal facility.

- **Bio-remediation Facility**

Soils that have been contaminated with hydrocarbons (oils, grease, diesel, petrol) and are to be taken to the designated bio-remediation facility for temporary storage before being dispatched to an off-site authorized hazardous waste facility or treated *in-situ*. Should it be deemed necessary in future, a bioremediation facility may be built to treat these materials on site using the proposed methodology below. However, it is currently anticipated that only limited quantities will be generated as the fleet required running a mine of this magnitude is minimal and thus expecting little waste soil generation.

- **Bio-remediation procedure:**

The process of bio-remediation will be completed according to the following steps:

- ***STEP 1:*** For larger spills (covering a surface area of more than 1 m2), contain the spill using equipment provided in the spill kit/absorbent materials. For smaller spills (covering a surface area of less than 1 m2);
- ***STEP 2:*** Lift contaminated soils/ gravels and place them on a concreted surface/ plastic lining/drum where storm water run-off collected on this surface is contained;
- ***STEP 3:*** Apply selected bio-remediation product to the contaminated soils/ materials. The volume of product used will depend on the volume of the contamination in the soils and should be guided by the manufacturer's instructions;

- ***STEP 4:*** Wet the contaminated soils/ gravels. The volume of water used should be guided by the manufacturer's instructions;
- ***STEP 5:*** Till the soils/ gravels to mix in the bio-remediation products, ensure all contaminated material is wet and to aerate the contaminated material;
- ***STEP 6:*** Cover the contaminated soils/gravel with plastic to contain moisture and heat;
- ***STEP 7:*** Repeat steps 3 to 6 once a week until the soils appear and/or feel clean;
- ***STEP 8:*** Send a sample of the contaminated material for testing to determine the hydrocarbon contamination, in parts per million. As there is no guideline as to the allowable levels of hydrocarbons occurring in soils (due to the varying natural levels), a soil/ gravel sample from an un-polluted area of the site must be sent away for testing to determine the baseline condition which must be attained;
- ***STEP 9:*** If the soils/ gravels are still contaminated, repeat steps 3 to 7 until the hydrocarbon content of the soils/ gravels equals the baseline condition described above;
- ***STEP 10:*** Make use of the cleaned soils during concurrent rehabilitation.

Strategies and Performance Objectives/Goals

The purpose of this document is to clearly outline control strategies that link with agreed performance criteria for those potential environmental impacts as identified, be it public or worker related or specific to the broader surrounding environment. This is addressed through linkage to the following closure objectives:

- Leave rehabilitated ground to ensure blending with the surrounding environment;
- Minimisation of environmental damage or impacts to the extent that they are acceptable to stakeholders involved;
- Safeguarding of the safety and health of people and other organisms from hazards associated with operations;
- To leave the sensitive areas untouched and intact as they were prior to the mining activity;
- The elimination of the risk to the environment due to naturally occurring forces by ensuring physical and chemical stability of all structures;
- Mine closure is achieved efficiently, cost effectively, and in compliance with the relevant legal requirements;
- The social impacts resulting from mine closure are managed in such a way that establishment of a socially stable community in line with the principles of sustainable development is facilitated;
- Comprehensive monitoring takes place and that sound environmental standards have been followed;
- The Best Practical Guidelines that are available at the time of closure will be used;

Measures to achieve and sustain performance objectives

Nakedi Solutions intends to operate in line with the principles of ISO14001 Environmental Management System during all mining phases. The mine will develop an Environmental Management System (EMS)

that will aim at ensuring that all possible impacts associated with activities or processes undertaken at the mine are identified and mitigation measures implemented to avoid or minimise environmental degradation and to promote a healthy and safe working environment.

The EMS will incorporate environmental procedures to manage aspects that will have the potential to pose a risk of environmental pollution or degradation. These procedures will include water and waste management procedures. Environmental procedures will be updated regularly as aspect change or when there is a need for operational and technological advancement. The EMS will provide the mine with reporting requirements and conditions of the issued licenses form an integral part of the system.

This inadvertently ensure that mitigation measures for impacts associated with mining activities or processes on neighbouring communities and other stakeholders are undertaken with due consideration of the relevant stakeholders interests. The ISO 14001 system is based on the Deming`s management approach (Plan-Do-Check-Act) (PDCA), and all systems, procedures and documents are reviewed regularly to ensure that objectives of the system are being met, and that the system is continually improved.

In order for Nakedi Solutions to measure their compliance with the closure objectives they require to:

- Remove all infrastructure from the site in such a manner that no contamination of soils and water takes place;
- Slope the discard dump to such an angle (24 degrees in most cases) that the site drains naturally after rainfall event;
- Re-place all topsoil stripped from the site and vegetate slopes with naturally occurring indigenous vegetation;
- Continue with monitoring activities (surface and groundwater) during post-closure until the quality of the environment has returned to an acceptable state as agreed with appropriate stakeholders;
- Provide skills and training to the local community that will allow for sustainable job creation after mining has been completed.

PART B

2. ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1) Draft environmental management programme.

(a) Details of the EAP

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details of the EAP were included in Section A (1) in Part A of this report, and is therefore not repeated in this while the detailed CVs are attached as an Annexure.

(b) Description of the Aspects of the Activity

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

- ***ACTIVITIES***

- **Construction Phase**

In this phase site will be prepared, vegetation cleared, topsoil stockpile and offices as well as ablution brought it in order to prepare for the mining as well as bring in machinery and also employ the relevant skills required

- **During Operational Phase**

The operational phase will comprise of mining and processing. The following activities could lead to potential impacts include:

- Mining through drilling, blasting, haul, load, crushing and screening.
- This will also include washing at times in order to upgrade the mineral's grade and remove waste too.

- **Closure Phase**

Shaping of the mining and re-instatement of roads will be done after operation is completed. Stockpiles will be shaped by bulldozing during rehabilitation phase to produce a depression that will blend with the adjacent topography of the subject project operation. Topsoil will be spread out after landscaping of the shallow materials and seeded; rehabilitation plan should be prepared for the mine.

(c) Composite Map

(Provide a map **(Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

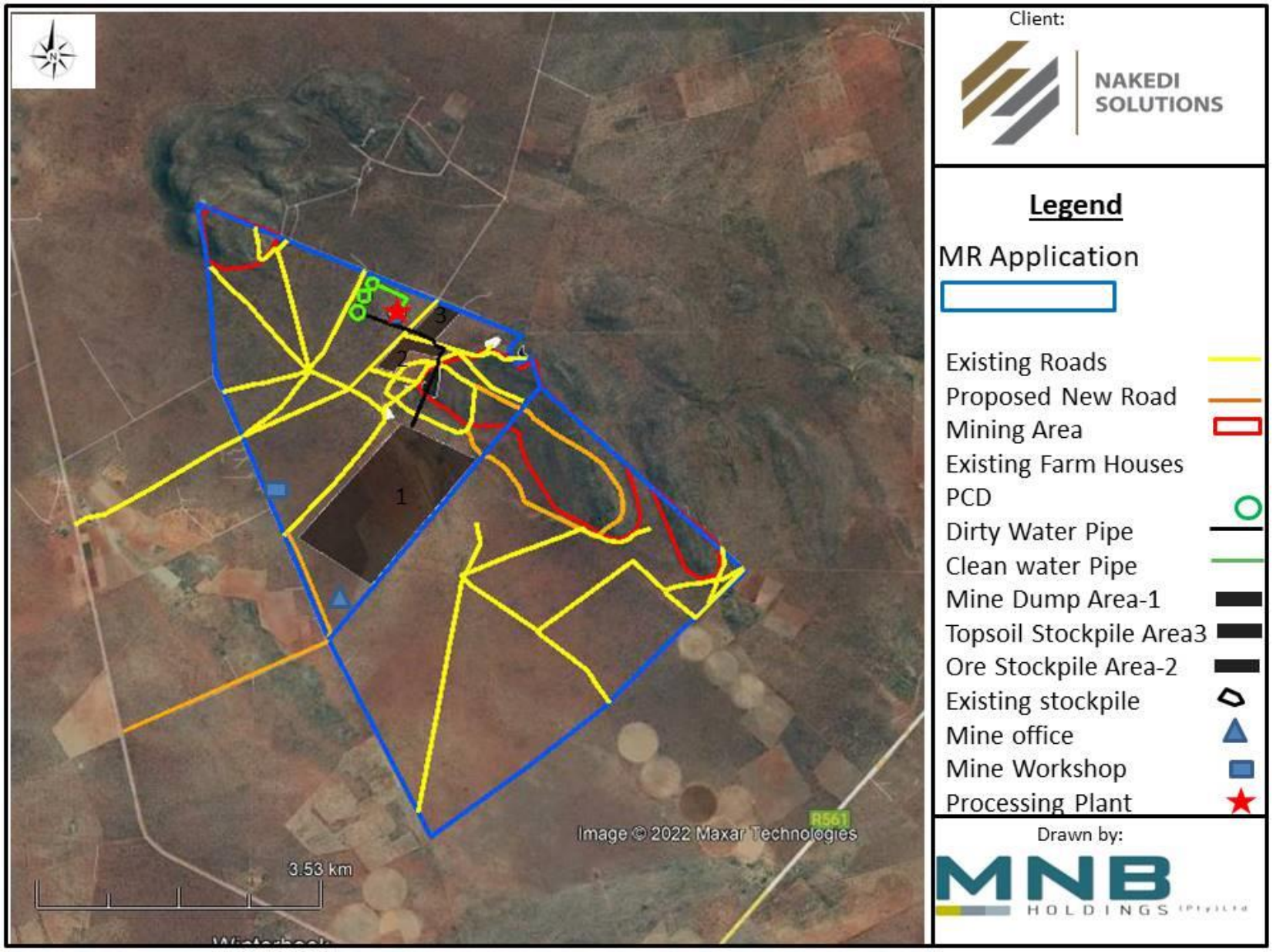


Figure 39: Composite Map of the applied area

(d) Description of Impact management objectives including management statements

i) Determination of closure objectives.

(ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The EMPr provides the following broad closure vision as shown on ***table 2-1*** below:

- The post mining land of disturbed footprint, excluding the pits will be restored to arable and or grazing conditions as far as practicable.
- Rehabilitation will restore surface mining areas to pre-mining mining land capability as far as practical to its original 'grass land' production potential.
- The closure objectives must be aligned with the current land use on the site in order to have a base of the activity which was happening or which could happen on the land at present moment.

Table 2-1: The closure vision

CLOSURE OBJECTIVE	CLOSURE CRITERIA
Ensure physical stability and public safety of mine areas	• Opencast pit high walls will be cut back by 10 meters and graded to a 1:3 slope. • Rehabilitated overburden rock dump will remain in situ and slopes will not exceed 1:5. • All mine related infrastructure to be dismantled and removed. • All disturbance footprint to be top soiled, seeded and re-vegetated to ensure stability
Restore pre-mining land use to grazing potential	• Opencast mining pits will remain and grazing potential can't be restored • All disturbance footprints to be rehabilitated per standard to ensure sustainable indigenous veld grass is established.
Ecological biodiversity	• Post closure rehabilitation is stable to ensure streams are not impacted from erosion • Grassland diversity is re-established.

ii) The process for managing any environmental damage, pollution, Pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

- **Pollution Control**

Pollution could result from the release, accidental or otherwise, of chemicals, oils, fuels, sewage, wastewater containing organic kitchen waste, detergents, solid waste, litter and other such substances. The following measures must be implemented to prevent possible pollution"

- The contractor shall ensure that rainwater does not run into areas containing cement, oil, diesel and other such substances as this could result in a pollution threat to sensitive environmental areas.
- Fuel tanks must be placed in designated areas with concrete bunded walls, collection trays and fire extinguishers. Any spillage of fuel, oils, sewage resulting in soil contamination shall be cleaned up at the expense of the contractor.
- Used fuels/oils hydraulic fluids, paints solvents and grease must be stored in drums or suitable containers and must be disposed off at an appropriate site or sent to a local recycling plant.
- Never allow any hazardous substances to soak into soil.

Runoff from the site itself must be free from oil, waste and litter before joining the stormwater system. This must be ensured by securing any containers containing hazardous substances, in order that it cannot enter runoff, and by cleaning up any refuse and construction material from the site on a regular basis.

- In addition to the mitigation measures to manage impact on the project site, the monitoring program and remediation measures should be complied with. A detailed monitoring program is represented in Table 10

Table 2-2: Impacts requiring monitoring programmes and reporting frequency.

IMPACTS REQUIRING MONITORING PROGRAMMES	ASPECT TO BE AFFECTED	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY
SOURCE ACTIVITY: Construction of the proposed open pit mining and related activities.				
• **Constructions Phase:** The clearance of vegetation and establishment of the pits will alter drainage patterns of the surface water runoff. • **Operational phase:** The operation and utilisation of diversion berms and trenches (around the plant area, the opencast area and the workshop area) will redirect surface water either to dirty water management or clean water management area. Oil and hydrocarbon spillages may pollute the surface water runoff. Offset mitigation measures should be implemented. • **Decommissioning phase:** As the water management infrastructure will only be decommissioned after all the other infrastructure has been decommissioned.	Surface water and pans could be affected however on this site these are not there	There are no wetland features and or pans within the proposed project area. However, Surface water monitoring: sampling Upstream and downstream of the non-perennial rivers (this will be archived by performing a Sediment analysis).	Hydrology and Ecology specialists should be appointed to undertake the monitoring and result of such monitoring should be submitted to the Environmental Manager	**Monitoring & Sampling Frequency:** Ecological Monitoring of the pans not destroyed during the mining will occur twice per annum **Reporting:** **Monthly:** Internal data report. **Quarterly:** Data report to authorities (DWS). **Annually:** Annual status report.

• **Construction Phase:** The clearance of vegetation and establishment of the pits will alter drainage patterns, runoff and infiltration. The removal of soils and hards will affect the water table. • **Operational phase**: The groundwater table will be lowered due to water ingress in the opencast pit. Surface water runoff that may come into contact with hydrocarbon material or any unattended to spillage may infiltrate and contaminate groundwater resources, in the event of any spillages. The ingress water in pits will be treated at the water plant prior to release into the environment. • **Decommissioning phase:** Oils and hydrocarbons from vehicles will act as pollutants which may infiltrate and pollute the groundwater. Rehabilitation of the open pits can lead to decanting of water into the pits. Seepage from	Groundwater	**Groundwater monitoring:** Sampling of boreholes (quality and quantity). There are a number of boreholes on and off the site. It is recommended that since the pollution plume will have 2km radius from the pits Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine should liaise with farmers of the affected areas and add their boreholes to the monitoring program	A groundwater specialist should be appointed to conduct the water monitoring as well as use of an accredited lab. Results of the water monitoring will be submitted to the Environmental Manager.	**Monitoring & Sampling Frequency:** Quarterly sampling of boreholes. Additional specifications will be added as conditions from the WULA. In terms of flow, all water uses and discharges will be measured on an on-going basis and the total calculated on the last day of every month. **Reporting:** **Quarterly:** Ground water monitoring report to Nakedi Solutions from the appointed specialist and Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine will report the findings to DWS. **Annually:** An annual report with evaluated results from the cumulative monitoring result on groundwater quality and quantity should be submitted.

backfilled material can affect the water quality as well as increase the risk of acid mine drainage.				
• **Construction Phase:** There will be extensive vegetation clearance, dust generation from the construction activities and increased vehicle movement on grave roads will affect the indigenous vegetation on site. Cleared areas will be prone to alien invasive species • **Operational & Decommissioning phase:** Dust may be generated from the utilisation of the haul roads and during the backfilling- and decommissioning process, which may settle on the vegetation and affect the natural plant functions.	Fauna & Flora	Prior to construction a tree removal permit will be required. **Flora monitoring:** monitoring and inspections of undisturbed indigenous flora, vegetation cover on disturbed areas, growth of invasive species and weeds, Endangered & Red data species.	An Ecological specialist to be appointed to undertake the permit application. An alien Invasive management plan should be designed and implemented by the ECO and Environmental Manager	**Monitoring Frequency:** ECO to monitor tree removal including illegal tree removal by employees, vegetation clearances and alien invasive plant growth. This should be done monthly during construction and after that quarterly or on a seasonal basis. **Reporting:** **Annually:** Internal reporting on the status of the vegetation cover. o Internal audits to be included in the EMP performance assessment conducted every two years.
• **Construction phase**: During site establishment soils will be stripped and soil stockpiles, these stockpiles will be vulnerable to	Soil	**Soil monitoring:** Visual inspection of soils on roads, topsoil stockpiles and construction sites. Re-vegetation of topsoil's	ECO and Environmental Manager	**Monitoring:** Inspections of soil for spillages, signs of erosion and alien invasive and weed encroachment should be

alien invasive species, oil and hydrocarbon spillages will pollute the soils and alter the structure and functioning of the soils. • **Operational phase:** As mining progresses and more soil stockpiles are created, the soil will be prone to weeds establishing which will compromise the integrity of the soil, even when replaced for rehabilitation. Vehicles and machinery may leak or spill hydrocarbons in areas of use. This will pollute the soils and alter the structure and functioning of the soils. • **Decommissioning phase:** The topsoil will be places after the open pit areas have been backfilled. Rehabilitation activities will result in compaction due to the movement of vehicles and machinery dismantling which will lead to the degradation of soils and the land capability if not monitored and properly managed. A soil specialist must be appointed post		should be done immediately to avoid loses due to wind and water erosion as the area is prone to flash floods.		conducted on a weekly basis. **Reporting:** **Monthly:** SHEQ Inspection reports. Internal audits to be included in the EMP performance assessment conducted every two years.

rehabilitation to monitor the rehabilitation efforts.				
• **Construction phase**: Construction Phase: there will be extensive vegetation clearance, dust generation from the construction activities and increased vehicle movement on grave roads will affect the indigenous vegetation on site • **Operational phase:** Blasting, Iron ore, Manganese, Gemstone and Silica stripping and haulage will generate dust at the open pit which on windy days will migrate from the pit to the surrounding areas. • **Decommissioning phase:** Dust may be generated as a result of the decommissioning (removal of redundant infrastructure) and rehabilitation activities and may migrate to surrounding areas.	Air Quality	**Air Quality Monitoring:** Dust Monitoring on the site using dust buckets and PM10 monitoring, Regular internal monitoring by SHEQ. Fallout dust should be tested for particulates at an accredited laboratory.	An Air Quality Specialist who will submit the reports to the Environmental Manager or ECO. The SHEQ team will also conduct regular internal checks	**Sampling and Monitoring Frequency:** Dust samples will be taken on a monthly basis. **Reporting:** **Monthly:** Internal reporting. **External submissions**: Audit Report and Data report submitted to DMRE as part of the EMP performance assessment conducted every two years.
• **Operational phase:** Removal and construction of temporary overburden stockpiles as mining progresses (this may include the	Geology	**Blasting:** Ground vibrations monitoring	Environmental Manager/Geologist	Monitoring: Ground vibrations will be measured annually. Reporting: Results must be included external EMP performance assessment

drilling and blasting of hard overburden to expose the Iron Ore).				conducted every two years.
	Geology	Subsidence and earth movement monitoring.	Environmental Manager/Geologist	Monitoring: Concurrently with mining activities throughout the entire LOM until closure has been obtained.
• Construction **phase:** Increased noise levels due to vehicle movement and hauling of material. • Operational phase: The major sources of noise relating to mining including blasting of the overburden, conveying of the ore and traffic within and off the site. • Decommissioning phase: Activities anticipated to cause noise impacts during the decommissioning phase include the demolishing of infrastructure, loading, hauling, placing and shaping of any remaining waste and discard dumps; loading, hauling, placing and shaping of topsoil (all disturbed areas, including stockpile sites and demolished infrastructure).	Noise	Noise monitoring at the open pit areas and baseline noise measurement of the whole area as all activities within the mining area will add to the cumulative increase in noise levels	SHEQ and a specialist who will assess the nose levels at the plant will submit their report to the Environmental Manager	**Sampling and Monitoring Frequency:** Dust samples will be taken on a monthly basis. **Reporting:** **Monthly:** Internal reporting. **External submissions**: Audit Report and Data report submitted to DMRE as part of the EMP performance assessment conducted every two years.

IMPACTS REQUIRING MONITORING PROGRAMMES	ASPECT TO BE AFFECTED	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY
SOURCE ACTIVITY: Construction, operation and decommissioning of the Processing Plant				
• **Construction phase:** Potential Spillages, leakages of hydrocarbon materials from construction vehicles and machinery, loosening of soil and dust will increase sedimentation **Operational phase:** No seasonal rivers can be polluted by dirty water runoff from the processing plant if the water is adequately contained and channelled through dirty water channels or berms into the pollution control dam. • **Decommissioning phase:** Due to spillages of oils and hydrocarbons surface water runoff might be contaminated. Should surface water runoff become contaminated with spillages resulting from decommissioning activities, it should be directed to the PCD.	Surface water and pans	**Surface water monitoring:** There are no wetland features and or pans within the proposed project area.	Hydrology and Ecology specialists should be appointed to undertake the monitoring and result of such monitoring should be submitted to the Environmental Manager	**Monitoring & Sampling Frequency:** During the operational and construction phase, any stream that may exist. o The water levels of the proposed PCDs will be surveyed on a monthly basis, once they become operational **Reporting:** **Monthly:** Internal data report. **Quarterly:** Data report to authorities (DWS). **Annually:** Annual status report.
• **Construction phase:** Oils and hydrocarbon spillages from	Groundwater	**Ground water monitoring:** Sampling of boreholes (quality	A groundwater specialist should be	**Monitoring & Sampling Frequency:** Quarterly

construction vehicles or machinery (should they occur) will affect the groundwater quality. The removal of vegetation and increased soil compaction will impact on infiltration rates and increased runoff. • **Operational phase**: Groundwater may become contaminated in cases where polluted surface water is not remediated immediately and left to pond for extended periods of time • **Decommissioning phase:** Oil and hydrocarbon Spillages from vehicles and machinery utilised during decommissioning may contaminate groundwater through seepage.		and quantity). There are a number of boreholes on and off the site. It is recommended that since the pollution plume will have 2km radius from the pits Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine should liaise with farmers of the affected areas and add their boreholes to the monitoring program	appointed to conduct the water monitoring as well as use of an accredited lab. Result of the water monitoring will be submitted to the Environmental Manager	sampling of boreholes. Additional specifications will be added as conditions from the WULA. In terms the water balance all flows to the plant, all water uses and discharges will be measured on an on-going basis and the total calculated **on the last day of every month.** The water quality at the water plant will also be tested prior to release into the environment **Reporting:** **Quarterly:** Ground water monitoring report to Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine from the appointed specialist and Nakedi Solutions Mine will report the findings to DWS. **Annually:** An annual report with evaluated results from the cumulative monitoring result on groundwater quality and quantity should be submitted.

• **Construction phase:** Vegetation clearance, dust generation from the construction activities and increased vehicle movement on grave roads will affect the indigenous vegetation on site. Cleared areas will be prone to alien invasive species • **Operational phase:** Increased alien invasive species growth in the disturbed surface areas and via transportation of seeds on clothing etc. if not appropriately managed or prevented alien invasive vegetation may thrive in the cleared areas impacting on the natural vegetation. • **Decommissioning phase:** Rehabilitated if not properly managed and monitored areas will be vulnerable to the establishment of alien invasive vegetation.	Flora & Fauna	Prior to construction a tree removal permit will be required. **Flora monitoring: m**onitoring and visual inspections of undisturbed indigenous flora, vegetation cover on disturbed areas, growth of invasive species and weeds, Endangered & Red data species.	Ecology specialist to be appointed to undertake the permit application. An alien invasive management plan should be designed and implemented by the ECO and Environmental Manager	**Monitoring Frequency:** ECO to monitor tree removal including illegal tree removal by employees, vegetation clearances and alien invasive plant growth. This should be done **monthly** during construction and after that quarterly or on a seasonal basis. **Reporting:** **Annually:** Internal reporting on the status of the vegetation cover. Internal audits to be included in the EMP performance assessment conducted every two years.
• **Construction phase:** Construction activities including movement of vehicles on gravel roads, site clearances will expose surfaces through the removal of	Air Quality	**Air Quality Monitoring**: Dust Monitoring on the site using dust buckets and PM_{10} monitoring, regular internal monitoring by SHEQ.	Air Quality Specialist who will submit the reports to the Environmental Manager. The SHEQ	**Sampling and Monitoring Frequency:** Dust samples will be taken on a monthly basis. **Reporting:** **Monthly:** Internal reporting.

vegetation will increase the rates of erosion, dust generation and vulnerability to natural forces like wind and surface water runoff. • **Operational phase:** Vehicles movement and Iron ore, Manganese, Gemstone and Silica dust from conveyor belt to the plant as well as the operation of the plant will generate dust. Intensive dust suppression on gravel roads should be implemented and haul vehicles should follow designated pathways. • **Decommissioning phase:** Dust will be generated by the operation of vehicles and machinery used for the rehabilitation and decommissioning activities. Un-vegetated soils in rehabilitated areas will be vulnerable to wind and water erosion, reducing their potential through loss of minerals. Re-Vegetation should be implemented immediately after rehabilitation.		Fallout dust should be tested for particulates at an accredited laboratory	team will also conduct regular internal checks	**External submissions**: Audit Report and Data report submitted to DMR as part of the EMP performance assessment conducted every two years.

• **Construction phase:** Soil stripped to clear land for the construction of the plant will be removed and stockpiled. • **Operational phase:** Soils may be affected should any polluted water spillages occur from the water treatment plant and sewage treatment plant or through breaches in channels to transport dirty water to the plant. Hydrocarbon spillages from operational vehicles may contaminate the soils if not removed timeously. • **Decommissioning phase:** Soils on surface may be contaminated through polluted water spillages from the pilot water treatment plant. Rehabilitation activities may result in some erosion of, compaction of and / or degradation of soils, if not managed.	Soil	**Soil monitoring**: Visual inspection of soils on roads, topsoil stockpiles and construction sites. Re-vegetation of topsoil should be done immediately to avoid loses due to wind and water erosion as the area is prone to flash floods.	ECO and Environmental Manager	**Monitoring:** Inspections of soil for spillages, signs of erosion and alien invasive and weed encroachment should be conducted on a weekly basis. **Reporting:** **Monthly**: SHEQ Inspection reports. Internal audits to be included in the EMP performance assessment conducted every two years.
• **Construction phase:** Construction vehicles will generate noise, and the noise generated may pose a nuisance to nearby	Noise	Noise monitoring at the plant and baseline noise measurement of the whole area as all activities within the mining area will add to	SHEQ and a specialist who will assess the noise levels at the plant will submit their	**Monitoring:** Noise sampling will be conducted on a monthly basis. **Reporting**: The results and

farm owners and surrounding land occupants. • **Decommissioning phase:** Noise will be generated by the operation of vehicles and machinery used for the rehabilitation and decommissioning activities		the cumulative increase in noise levels	report to the Environmental Manager	findings should be documented in **monthly** reports and be utilised for the annual internal EMP PA and the EMP performance assessment conducted every two years.

IMPACTS REQUIRING MONITORING PROGRAMMES	ASPECT TO BE AFFECTED	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY
SOURCE ACTIVITY: Construction, operation and decommissioning of the PCD and water management infrastructure				
• **Construction phase:** Site clearance of vegetation and leveling of land for the construction of the PCD may alter drainage patterns of the surface water runoff. Surface water quality may also be impacted on through the spillages and leakages of hydrocarbon materials from construction vehicles and machinery. • **Operational phase:** Surface water may be polluted should there be an incident where PCD spillage from the dam is not contained within the stormwater management infrastructure.	Surface water and pans	**Surface water monitoring:** There are no wetland features and or pans within the proposed project area. However, Surface water monitoring: sampling Upstream and downstream of the non-perennial rivers (this will be archived by performing a Sediment analysis).	Hydrology and Ecology specialists should be appointed to undertake the monitoring and result of such monitoring should be submitted to the Environmental Manager	**Monitoring & Sampling Frequency:** During the operational and construction phase. The water levels of the proposed PCDs will be surveyed on a monthly basis, once they become operational **Reporting:** **Monthly:** Internal data report. **Quarterly:** Data report to authorities (DWS). **Annually:** Annual report.
• **Construction phase:** Oils and hydrocarbon spillages from construction vehicles or machinery (should they occur) will affect the groundwater quality. The removal of	Groundwater	Ground water monitoring: Sampling of boreholes (quality and quantity). There are a number of boreholes on and off the site. It is recommended that since the pollution plume will have 2km	A groundwater specialist should be appointed to conduct the water monitoring as well as use of an accredited lab. Result	**Monitoring & Sampling Frequency:** Quarterly sampling of boreholes. Additional specifications will be added as conditions from the WULA. In terms the water balance all flows

vegetation and increased soil compaction will impact on infiltration rates and increased runoff. • **Operational phase**: Groundwater may become contaminated in cases where polluted surface water is not remediated immediately and left to pond for extended periods of time • **Decommissioning phase:** Oil and hydrocarbon Spillages from vehicles and machinery utilised during decommissioning may contaminate groundwater through seepage		radius from the pits Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine should liaise with farmers of the affected areas and add their boreholes to the monitoring program	of the water monitoring will be submitted to the Environmental Manager	to the plant, all water uses and discharges will be measured on an ongoing basis and the total calculated **on the last day of every month.** The water quality at the water plant will also be tested prior to release into the environment **Reporting:** **Quarterly:** Ground water monitoring report to Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine from the appointed specialist and Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine will report the findings to DWS. **Annually:** An annual report with evaluated results from the cumulative monitoring result on groundwater quality and quantity should be submitted.

IMPACTS REQUIRING MONITORING ROGRAMMES	**ASPECT TO BE AFFECTED**	**FUNCTIONAL REQUIREMENTS FOR MONITORING**	**ROLES AND RESPONSIBILITIES**	**MONITORING AND REPORTING FREQUENCY**
SOURCE ACTIVITY: Operation of the Mine				
• **Mining phase:** There is no river	Surface water	**Surface water monitoring:** There	Hydrology and	**Monitoring & Sampling**

nearby and as such the is no impact may be impacted on through the spillages and leakages of hydrocarbon materials from operations vehicles and machinery. The pans on site may be impacted on by the operation. • **Operational phase:** the closest seasonal rivers may be polluted should any polluted water spillages occur from the water treatment plant or sewage treatment plant if the channels and berms designed to transport and contain dirty water to the water treatment plant are compromised. • **Decommissioning phase:** Should surface water runoff come into contact with oil and hydrocarbon spillages resulting from decommissioning activities and is not contained contamination of the seasonal rivers will occur.	& Pans	are no wetland features and or pans within the proposed project area.	Ecology specialists should be appointed to undertake the monitoring and result of such monitoring should be submitted to the Environmental Manager.	**Frequency:** During the operational and construction phase will be sampled on a monthly basis. **Reporting:** **Monthly:** Internal data report. **Quarterly:** Data report to authorities (DWS). **Annually**: Annual status report.
• **Construction phase:** Oils and	Groundwater	**Ground water monitoring:**	A groundwater	**Monitoring & Sampling**

hydrocarbon spillages from construction vehicles or machinery (should they occur) will affect the groundwater quality. The removal of vegetation and increased soil compaction will impact on infiltration rates and increased runoff. • **Operational phase:** Groundwater may become contaminated in cases where polluted surface water is not remediated immediately and left to pond for extended periods of time • **Decommissioning phase:** Oil and hydrocarbon Spillages from vehicles and machinery utilised during decommissioning may contaminate groundwater through seepage.		Sampling of boreholes (quality and quantity). There are a number of boreholes on and off the site. It is recommended that since the pollution plume will have 2km radius from the pits Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine should liaise with farmers of the affected areas and add their boreholes to the monitoring program	specialist should be appointed to conduct the water monitoring as well as use of an accredited lab. Result of the water monitoring will be submitted to the Environmental Manager	**Frequency**: Quarterly sampling of boreholes. Additional specifications will be added as conditions from the WULA. In terms the water balance all flows to the plant, all water uses and discharges will be measured on an on-going basis and the total calculated on the last day of every month. The water quality at the water plant will also be tested prior to release into the environment **Reporting:** **Quarterly:** Ground water monitoring report to Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine from the appointed specialist and Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine will report the findings to DWS. **Annually:** An annual report with evaluated results from the cumulative monitoring result on groundwater quality and quantity

				should be submitted.
• **Operational phase:** The increased human activity, noise generation and lighting from the processing plant may frighten the fauna on the farms. Poaching is also highly likely dude to the increase in population of workers and job seekers.	Fauna & Flora	**Animal monitoring:** Field assessments to investigate displacement of fauna, a record of accidental animal killings and poaching, investigate and record unauthorised snares and traps. Relocation, catch and release for injured fauna as well as relocation to conservation areas and habitat reconstruction where possible.	Suitably qualified personnel must assist in the relocation of the game animals to areas of conservation. The ECO and employees will be responsible for the safety of fauna on the site and reporting will be done to the Environmental Manager.	**Monitoring:** an Ecologist should be appointed to conduct regular surveys throughout the life of mine. Daily siting's must be recorded on an incident basis. **Reporting:** **Annually:** The ecology survey report will be used in conjunction with the faunal reports and submitted to management. ○ Internal audits and incident reports should be included in the EMP performance assessment conducted every two years.
• **Operational phase:** Soils may be affected should any polluted water spillages occur from the water treatment plant and sewage treatment plant or through breaches in channels to transport dirty water to the plant. Hydrocarbon spillages from operational vehicles may contaminate the soils if not removed timeously**.**	Soil	**Soil monitoring:** Visual inspection of soils on roads, topsoil stockpiles and the sites. Re-vegetation of topsoil's should be done immediately to avoid loses due to wind and water erosion as the area is prone to flash floods.	ECO and Environmental Manager	**Monitoring:** Inspections of soil for spillages, signs of erosion and alien invasive and weed encroachment should be conducted on a weekly basis. **Reporting:** **Monthly:** SHEQ Inspection reports. Internal audits to be included in the EMP performance assessment conducted every two years.

• **Decommissioning phase:** Soils on surface may be contaminated through polluted water spillages from the pilot water treatment plant. Rehabilitation activities may result in some erosion of, compaction of and / or degradation of soils, if not managed				
• **Operational phase:** Vehicles movement and Iron ore, Manganese, Gemstone and Silica dust from conveyor belt to the plant as well as the operation of the plant will generate dust. Intensive dust suppression on gravel roads should be implemented and haul vehicles should follow designated pathways. • **Decommissioning phase:** Dust will be generated by the operation of vehicles and machinery used for the rehabilitation and decommissioning activities. Un-vegetated soils in rehabilitated	Air Quality	**Air Quality Monitoring**: Dust Monitoring on the site using dust buckets and PM10 monitoring, regular internal monitoring by SHEQ. Fallout dust should be tested for particulates at an accredited laboratory	Air Quality Specialist who will submit the reports to the Environmental Manager. The SHEQ team will also conduct regular internal checks	**Sampling and Monitoring Frequency:** Dust samples will be taken on a monthly basis. **Reporting:** **Monthly:** Internal reporting. **External submissions**: Audit Report and Data report submitted to DMR as part of the EMP performance assessment conducted every two years.

areas will be vulnerable to wind and water erosion, reducing their potential through loss of minerals. Re-Vegetation should be implemented immediately after rehabilitation.				
• **Operational phase:** Noise levels will increase at the water and waste plants and due to operation of the plants which will increase ambient noise levels in the area. The increase in noise levels at the plant can pose health issues for the employees working at the plants should proper PPE not be used and the increase in noise level may pose as a nuisance to surrounding community and residents. • **Decommissioning phase:** Noise will be generated by the operation of vehicles and machinery used for the rehabilitation and decommissioning activities	Noise	Noise monitoring at the plant and baseline noise measurement of the whole area as all activities within the mining area will add to the cumulative increase in noise levels	SHEQ and a specialist who will assess the noise levels at the plant will submit their report to the Environmental Manager	**Monitoring:** Noise sampling will be conducted on a monthly basis. **Reporting**: The results and findings should be documented in monthly reports and be utilised for the annual internal EMP PA and the EMP performance assessment conducted every two years.

IMPACTS REQUIRING MONITORING PROGRAMMES	ASPECT TO BE AFFECTED	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY
Source Activity: Concurrent Rehabilitation				
• **Concurrent rehabilitation:** Potential Spillages, leakages of hydrocarbon materials from construction vehicles and machinery, loosening of soil and dust will increase sedimentation into the seasonal rivers.	Surface water and Pans	**Surface water monitoring:** There are no wetland features and or pans within the proposed project area. However, Surface water monitoring: sampling Upstream and downstream of the non-perennial rivers (this will be archived by performing a Sediment analysis).	Hydrology and Ecology specialists should be appointed to undertake the monitoring and result of such monitoring should be submitted to the Environmental Manager.	**Monitoring & Sampling Frequency:** During the operational and construction phase **Reporting:** **Monthly**: Internal data report. **Quarterly:** Data report to authorities (DWS). **Annually:** Annual status report.
• **Concurrent Rehabilitation:** The backfilling of the open cast areas will see an increase in the potential for seepage contamination into the groundwater regime and possible decanting in the pits. This may impact on / add to the development of a pollution plume. Oil spillages and hydrocarbon spillages from vehicles and machinery used to backfill the pits may contaminate groundwater through seepage.	Groundwater	Ground water monitoring: Sampling of boreholes (quality and quantity). There are a number of boreholes on and off the site though the site has limted boreholes.. It is recommended that since the pollution plume will have 2km radius from the pits Mine should liaise with farmers of the affected areas and add their boreholes to the monitoring program	A groundwater specialist should be appointed to conduct the water monitoring as well as use of an accredited lab. Results of the water monitoring will be submitted to the Environmental Manager	**Monitoring & Sampling Frequency:** Quarterly sampling of boreholes. Additional specifications will be added as conditions from the WULA **Reporting:** **Quarterly**: Ground water monitoring report to Nakedi Mine from the appointed specialist and Nakedi Mine will report the findings to DWS. **Annually:** An annual report with evaluated results from the cumulative monitoring result on groundwater quality and quantity

				should be submitted.
• **Concurrent rehabilitation:** The mined areas in the open cast pits may be susceptible to alien invasive species growth. Dust generated by the rehabilitation activities (vehicle and machinery movement), as well as the backfilling and placing of soils in rehabilitated areas may impact vegetation growth by settling on plants.	Flora & Flora	Prior to construction a tree removal permit will be required. Flora monitoring: monitoring and visual inspections of undisturbed indigenous flora, vegetation cover on disturbed areas, growth of invasive species and weeds, Endangered & Red data species.	Ecology specialist to be appointed to undertake the revegetation process. An alien invasive management plan should be designed and implemented by the ECO and Environmental Manager	**Monitoring Frequency:** ECO to monitor tree removal including illegal tree removal by employees, vegetation clearances and alien invasive plant growth. This should be done monthly during construction and after that quarterly or on a seasonal basis. **Reporting:** **Annually:** Internal reporting on the status of the vegetation cover. Internal audits to be included in the EMP performance assessment conducted every two years.
• **Concurrent rehabilitation:** Hydrocarbon leakages from vehicles and machinery used to backfill the open cast pits may contaminate the surrounding soils. Soil in the vicinity of the backfilled open cast areas can be compacted by rehabilitation activities.	Soil	Soil monitoring: Visual inspection of soils on roads, topsoil stockpiles and construction sites. Re-vegetation of topsoil's should be done immediately to avoid loses due to wind and water erosion as the area is prone to flash floods.	ECO and Environmental Manager	**Monitoring:** Success of indigenous re-vegetation and alien invasive and weed encroachment should be conducted on a weekly basis. **Reporting:** **Monthly:** SHEQ Inspection reports. Internal audits to be included in the EMP performance assessment

				conducted every two years.
• **Concurrent Rehabilitation:** Dust will be generated by the operation of vehicles and machinery used for the rehabilitation and backfilling of the pits. Soil in the backfilled areas under rehabilitation will be vulnerable to erosions due the elements (wind). The soil is placed in rehabilitation areas will need to be re-vegetated immediately.	Air Quality	**Air Quality Monitoring:** Dust Monitoring on the site using dust buckets and PM_{10} monitoring, regular internal monitoring by SHEQ. Fallout dust should be tested for particulates at an accredited laboratory	Air Quality Specialist who will submit the reports to the Environmental Manager. The SHEQ team will also conduct regular internal checks.	**Sampling and Monitoring Frequency:** Dust samples will be taken on a monthly basis. **Reporting:** **Monthly:** Internal reporting. **External submissions**: Audit Report and Data report submitted to DMR as part of the EMP performance assessment conducted every two years.
• **Decommissioning phase:** Noise from vehicles and machinery operations used for the rehabilitation and decommissioning activities.	Noise	Noise monitoring	Environmental Manager	**Monitoring:** Noise sampling will be conducted on a monthly basis. **Reporting**: The results and findings should be documented in monthly reports and be utilised for the annual internal EMP PA and the EMP performance assessment conducted every two years.

The monitoring program should focus on the following aspects as well as monitoring but not limited to:

- Groundwater;
- Flora and Fauna;
- Blasting and ground vibrations;
- Noise and Air quality; and
- Surface movement and subsidence
- Pollution control dams, clean and dirty water separation structures;
- Oil and water Spillages;
- Clean Water holding facilities;
- Fugitive Dust and sedimentation;
- Discard dump and waste management areas;
- Stockpiles.

In addition to monitoring, the emergency response and remediation procedure has to be developed and implemented. The purpose of this procedure is to anticipate the occurrence of environmental disasters, which may occur due to unforeseen circumstances. Since these events cannot be accurately predicted or prevented, a procedure has been prepared that must be followed should such an incident occur, which will assist in the mitigation, remediation and conservation of the environment and contribute to the safety of workers and the surrounding communities.

iii) **Potential risk of Acid Mine Drainage.**

(Indicate whether or not the mining can result in acid mine drainage).

The project will involve mining of open pit, while the occurrence of Acid Mine Drainage (AMD) exist due to the ingestion of water or contact of host rock and water, water will be pumped out regularly in the pit in order to continue working and also ponding of water and also unnecessary opening will be avoided in this site.

Therefore no AMD is anticipated on this site with mitigation method which will be applied. All water which will be discharged after being treated first.

iv) **Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.**

The project will not results in the generation of Acid Mine Drainage while there is a possibility of AMD occurring, water will be tested before being discharged out of the pit, especially that which has been in the pit for a long time. This is part of monitoring as well as evaluation of the current site in order to comply with the Water Act as well as Best Practice Guide (BPG)

v) **Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.**

The project will not result in generation of Acid Mine Drainage and water channelling as well as ponds will be that of concrete nature, which will be designed by an engineer will be utilised. This will be in

order to create a closed circuit in the area by collecting dirty water, treating the water and then subsequently re-using it or storing it for usage on site.

vi) **Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.**

The project will not result in do generation of Acid Mine Drainage, while the occurrence of Acid Mine Drainage (AMD) exist due to the ingestion of water or contact of host rock and water, water will be pumped out regularly in the pit in order to continue working and also ponding of water and also unnecessary opening will be avoided in this site.

Therefore no AMD is anticipated on this site. All water which will be discharged will be treated first after it has been stored in dams.

vii) **Volumes and rate of water use required for the mining, trenching or bulk sampling operation.**

This will be properly addressed during the application of the Water Use Licence.

viii) **Has a water use licence has been applied for?**

No, but a Water Use Licence application will be lodged in the near future

ix) **Impact to be mitigated in their respective phases**

Table 2-3: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES (as listed in 2.11.1)	**PHASE** of operation in which activity will take place. State; Planning and design, Pre- Construction, Construction, Operational, Rehabilitation, Closure, Post closure.	**SIZE AND SCALE of disturbance** (volumes, tonnages and hectares or m^2)	**MITIGATION MEASURES** (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	**COMPLIANCE WITH STANDARDS** (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	**TIME PERIOD FOR IMPLEMENTATION** Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-- Upon cessation of the individual activity or. -Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Excavating	pre- construction, Construction and operation		Dust control measures Noise control measures Storm water system		During and before construction or preparatory phase
Drill and Blasting	construction		access control measures		Before and during mining phase
Stockpiles	construction, operation and closure		Rehabilitation of disturbed land Dust control Measures Storm water system		

Loading, Hauling and Transporting	pre- construction, construction		Noise control measures Dust Control Measures		

(e) Impact Management Outcomes

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

ACTIVITY whether listed or not listed. (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air Pollution etc….etc…)	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	**MITIGATION TYPE** (modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. • Modify through alternative method. • Control through noise control • Control through management and monitoring • Remedy through rehabilitation.	**STANDARD TO BE ACHIEVED (**Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Vegetation Clearance	Dust, loss of vegetation	Air and environment	Construction Phase	Spray water to reduce dust Reduce the thickness of soil to be removed. Protect species which are endangered	Reduce topsoil loss Stockpile soil Re-vegetate after working on the area
Access route	Potential impact on Land scape and Environment	Potential sensitive viewers include the neighbors located within the project area	Operation phase	Minor	24 hour operations.
Drill and Blast	Fly rock Air Pollution	Lithology visibility	Operational phase	Notify near-by communities and farmers that are less than 500m	Reduced impact and damage to any structures and loss of

	Dust			away of the blasting intervals	life
Transporting of material on site	Dust Noise Degraded roads	Working site Mine and operational area Working roads on site	Operational phase	Maintain/grade the road Spray water to suppress dust	Well maintained roads Reduced dust roads
Stone crushing on site	Cumulative impact Noise impact and dust	Sensitive noise receptors within the project area	Operation phase	Negligible	No further mitigation prescribed. Apply noise mitigation measures described above.
Equipment storage	Impact on Land scape and visual Environment.	Potential sensitive viewers include the rural villages / rural residential dwellings located within the mining area.	Operation phase	Minor	Remedy through monitoring and rehabilitation measures.
Accommodation (camping site for mining contractors outside operational site.	Impact on the **Environment**	Vegetation	Operation phase	Moderate	This will be designated in environmental friendly manner, tents and camping tents will be used. Fire management control will be monitored. In terms of cooking on site and as a results of mining personnel on site.

(f) Impact Management Actions

(a description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

Table 2-4: Impact Management Actions

PHASE	ACTIVITY	POTENTIAL IMPACT	ASPECT AFFECTED	MITIGATION MEASURE	TIME PERIOD FOR IMPLEMENTATION	STANDARD TO BE ACHIEVED	COMPLIANCE WITH STANDARDS
Construction Phase	Air pollution from blasting, Wind erosions and vehicle Movement.	Vegetation	Increase in dust generation settling on adjacent vegetation. Continued increased levels of dust in the air have an effect on faunal species, particularly birds, but also on faunal species feeding on the vegetation.	Control through a dust suppression programme. This program should include (but not be limited to) the following measures: a) Shield stockpiles from predominant wind directions; b) Vegetate areas and ensure continual capping and vegetation of the sides of mine residue facilities; c) Regular spraying;	Construction phase	Minimisation of air pollution, particularly windborne particles.	Legal Compliance with: Compliance with National Dust Control Regulations (GNR 827). National Environmental Management: Biodiversity Act 10 of 2004

				d) Continuously remove Iron form site and reduce long-term stockpiling; **e)** clear Iron spillages from site			
Construction phase	Alien Invasive plant species on cleared areas	Vegetation	Alien invasive plant species will encroach into disturbed areas. It is expected that extensive area will be disturbed, natural vegetation totally destroyed.	Control through Management and Monitoring and implementation of an alien invasive management plan. - Remediation; Alien species removal programme must be developed and implemented.	Construction phase	Removal of alien invasive species including managing the distribution of weeds and invasive species avoided.	Compliance with the National Environmental Management: Biodiversity Act 10 of 2004 and the Alien and Invasive Species Lists, 2014.
Construction Phase	Change in land use (site clearing).	Loss of Avian habitats.	Avian habitats, including savannah Bushveld scrub and open areas will be destroyed by the proposed mine. The area required for mining and infrastructure	Control through legislative compliance: Tree removal permit. Prevention. A specialist must be engaged to check the entire property for active nests of red listed species. . Any such nests will need	Construction phase	No unauthorised vegetation clearing. Areas cleared for mining operations must be minimised.	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).

			on site. This will represent a significant loss of habitat in a region of high conservation significance, and will affect a number of red-listed species, including several raptors.	a buffer zone of 500 m radius around them to ensure that breeding animals if there are any			
Construction phase	Change in land use (site clearing).	Loss of animals habitat as well as vegetation and potential animals	Total or near-total irreplaceable loss of fauna and flora	Control through Management and Monitoring and implementation of an alien invasive management plan. - Remediation; Alien species removal programme must be developed and implemented.	Construction phase	**Control and Manage:** Implement buffer zones. The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m from the outer edge of	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004). Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and requirements of the Water Use License.

						the house. No river and its flood plain. Monitoring of the buffer zones should form part of the EM roles for internal audits.	
Construction Phase	Civil Construction	Fauna and Flora	Site clearing and removal of Indigenous vegetation will lead to a loss of faunal habitat. This has widespread impact on ecological function and health of sensitive ecosystems. Displacement of extraordinary high vertebrate species richness	Control and management Mitigating the impacts is impossible, although higher authorities may enforce statutory preconditions for protected animals if found on site.	Construction phase	No unauthorised vegetation clearing Areas cleared for mining operations must be minimised.	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).

Construction phase	Change in land use (site clearing).	Animals	Opencast mining is responsible for continued loss of faunal habitat. This has widespread impact on ecological function and health of sensitive ecosystems. Displacement of extraordinary high vertebrate species richness	Mitigating the impacts is impossible, even though minimisation of vegetation removal. Although higher authorities may enforce statutory preconditions for five Red Listed trees and waterways, such as buffer zones. The outer edge of the open cast, including roads and other. Control all waste dumping and avoid pollution of natural vegetation, infrastructure, should be at least 100 m from the outer edge of the river and its flood plain. The vegetation within this 100 m must remain undisturbed and natural.	Construction phase	**Control and Manage:** Implement buffer zones. The outer edge of the open cast, including roads and other infrastructure, should be at least 100 m from the outer edge of the house. No river and its flood plain exist on this site. Monitoring of the buffer zones should form part of the EM roles for internal audits.	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004). Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and requirements of the Water Use License.
Construction Phase	Clearing	Visual	Construction activities will take place during	Control and management Mitigating the impacts is impossible, although	Construction phase	Minimization through noise limitation and	Noise Induced Hearing Loss Regulations,

			between 07:00 and 17:00 on weekdays only to limit the impact on adjacent landowners. Construction vehicles and machinery will be regularly maintained to minimise noise generation. While on weekends a shorter construction time is proposed	higher authorities may enforce statutory preconditions		control	Occupational Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational Hygiene Regulations, MHSAct (29 of 1996), SABS 083, SANS 10083 National Environmental Management Act, Air Quality Act (NEMAQA) (Act No. 39 of 2004)
Construction phase	Clearing of vegetation and earthworks	Visual	Visual impacts are expected to result from the stripping of vegetation and earthworks associated with the pre-construction and construction phases of the	Control and Minimise Site clearances and Erosion control measures must be put in place if vegetation is to be cleared.	Construction phase	Reduced visual impacts on the site, adjacent landowners and residents	Guideline for Involving Visual and Aesthetic Specialists in EIA

			proposed Nakedi Solutions Iron mine. The stripping of vegetation will result in the bare soil being exposed, creating a visual scar within the area, and a contrasting colours in the landscape				
Construction Phase	Construction Phase Construction for site establishment and mining infrastructure	Pans	No pans were identified within the study area and also wetlands	N/A	N/A	N/A	N/A
Construction phase	Construction of buildings and/or plant	Baseline Noise Levels	Increased noise levels along the boundary of the proposed Site. Increased noise levels at open pit and plants	**Control and Minimisation:** Construction activities will take place during between 07:00 and 17:00 on weekdays only to limit the impact on adjacent	Construction phase	Minimization through noise limitation and control	Noise Induced Hearing Loss Regulations, Occupational Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational

				landowners. Construction vehicles and machinery will be regularly maintained to minimise noise generation.			Hygiene Regulations, MHSAct (29 of 1996) and National Environmental Management Act, Air Quality Act (NEMAQA) (Act No. 39 of 2004).
Construction Phase	Construction of offices, plant infrastructure ,workshops and other Associated mine infrastructure	Visual Resource	The process of construction equipment and related works in the construction of the plant and associated mining areas (e.g. storage areas, access roads) will introduce visually intrusive elements into the landscape and locally result in increased traffic. The construction of the project plant and infrastructure	Control by construction in low lying areas to reduce the view shed and minimise tree removal for screening effect. External signage should be kept to a minimum, were possibly shielding material should be utilised to fence of the construction	Construction phase	Reduced visual impacts on the site, adjacent landowners and residents	Guideline for Involving Visual and Aesthetic Specialists in EIA Processes

			will require removal of vegetation and alteration of the existing topography that will result in a change in the existing landscape character.				
Construction Phase	Construction of surface infrastructure (e.g. access roads, pipes, storm water diversion berms, change houses, admin blocks, drilling, blasting and development of pits for mining, etc.)	Air Quality	Activities of vehicles on access roads, levelling and compacting of surfaces, as well localised drilling and blasting will have implications on ambient air quality. The above mentioned activities will result in fugitive dust emissions containing TSP	**- Minimisation:** Working areas should be limited to the demarcated construction area only, and vehicular movement must be limited to designated haul roads and construction areas only. **- Remediate**: Disturbed areas should be rehabilitated as soon as possible to limit the development of erosion. timed blasting when there is no wind, dust	Construction phase	Minimisation of air pollution, particularly Windborne particles.	**Legal Compliance with :** Compliance with National Dust Control Regulations (GNR 827).

			(total suspended particulate, giving rise to nuisance impacts as fallout dust) Bulldozing, excavation, drilling and blasting operations will result in the emission of dust to atmosphere	suppression on roads, dampening of materials being transported, timeously completion of construction to reduce increased exposure time,			
Construction phase	Construction trenches and excavations on wetland and associated river	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Construction Phase	Earthworks and construction of plant infrastructure	Visual	Night-time lighting will be required during construction. Due to the level of screening provided by the existing vegetation cover	**Control:** Consider the application of motion detectors to allow the application of lighting only where and when it is required. **- Minimising:** Sources of light must as far as	Construction phase	Reduced visual impacts on the site, adjacent landowners and residents	Guideline for Involving Visual and Aesthetic Specialists in EIA Processes

			the impact of light pollution is expected to be limited, but may increase as construction progresses and more cranes and large plant are housed on site.	possible be shielded by physical barriers such as a planted trees and shrubs or built structures, where possible, natural vegetation around the Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine should be retained so as reduce unnecessary illumination and "light spill". All lighting must be installed at downward angles.			
Construction phase	Fuel storage and Vehicular Movement use and maintenance of haul roads (incl. transportation of minerals to plant	Surface Water	Water resources pollution due to spillage of oils, fuel and chemicals	**Control and manage:** Oil recovered from any vehicle or machinery on site should be collected, stored and disposed of by accredited vendors for recycling.	Construction phase	Compliance with proper waste management for hazardous and non-hazardous waste	National Environmental Management: Waste Act (2008) (Act 59 of 2008) and Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and requirements of the Water Use

							License.
Construction Phase	Fugitive dust from construction and vehicle movement	Baseline	Fugitive dust	**Control and remediation:** Institute a rigorous planting regime along the project site boundaries to act as bio-filters. Remediating Progressive rehabilitation of the Iron ore, Manganese, Gemstone and Silica mine should be undertaken.	Construction and rehabilitation phases	Minimisation of air pollution, particularly windborne particles.	Legal Compliance with: Compliance with National Dust Control Regulations (GNR 827).
Construction phase	Grading and building of new roads	Baseline Noise Levels	Increased noise levels along the boundary of the proposed Site	**Minimisation:** Construction activities will take place between 07:00 and 15:00 on weekdays only to limit the impact on adjacent landowners. Construction vehicles and machinery will be regularly maintained to minimise noise generation. Ensuring that equipment is well maintained and fitted with the correct and	Construction phase	Minimization through noise limitation and control	Noise Induced Hearing Loss Regulations, Occupational Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational Hygiene Regulations, MHSAct (29 of 1996), SABS 083, SANS 10083 National Environmental Management Act, Air

				appropriate noise abatement measures. Acoustical mufflers (or silencers) should be considered on equipment exhausts.			Quality Act (NEMAQA) (Act No. 39 of 2004)
Construction Phase	Human activities	Fauna	In addition to direct habitat loss, the disturbance of birds and other vertebrate fauna species in the surrounding areas will increase. This impact will be manifested both directly (e.g., increased poaching pressure and disturbance of nests) and indirectly (changes in prey availability, nesting material,	**Minimisation and monitoring**: Measures must be put in place to ensure that no illegal hunting of birds takes place on the mine property or.	Construction and rehabilitation phases	Manage and control illegal hunting activities. A specialist must be engaged to check the entire property for active nests of red listed species, such as White-back Vulture, Martial Eagle and Tawny Eagle. Any such nests	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).National Environmental Management: Waste Act (2008) (Act 59 of 2008) and Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and requirements of the Water Use License.

			etc.). Given the limited background Information available, the impact assessment here pertains to the worst case scenario.			will need to be relocated.	
Construction phase	Human dispersal of alien seeds/sampling by construction vehicles, shoes, clothes	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Construction Phase	Mining processing activities .	Ground and Surface water pollution	Pollution generated by the mine (e.g., acid mine drainage, accidental fuel	**Minimising and Monitoring;** Implement a rigorous pollution prevention program as	Construction, operation, decommissioning and post-closure	Groundwater monitoring will be done quarterly with the groundwater	Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and

			spillages, as well as pollutants such as mercury and lead) has the potential to severely affect avian habitats and therefore bird species along the No river downstream of the mine)	part of a comprehensive Environmental Management Plan (EMP)	phases	model updated every 2 years. Implementation of the IWWMP	requirements of the Water Use License.
Construction phase	Oil spillages	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Construction Phase	Powerline	Birds	The impact of such lines on birds will depend on the route the new line will follow, the size and configuration of the towers and lines, and the	**Minimise:** Any power line linking the mine to the existing grid will need a stand-alone impact assessment that can only be completed once specific routes have been identified. Such as	Construction phase	Tap into the already existing powerlines on the site.	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).

			impacts cannot be evaluated without this information. The issue is particularly pertinent in view of the number of species occurring in the area that are known to be vulnerable to collisions and electrocution risks, including vultures and large eagles.	assessment needs to include an evaluation of alternative routes, and careful assessment of the risks posed to birds, in particular vultures and other large raptors.			
Construction Phase	Preparation of the foot print area	Baseline Noise Levels	Increased noise levels on	**- Minimisation:** Construction activities will take place during between 07:00 and 15:00 on weekdays only to limit the impact on adjacent landowners. Biannual noise assessments	Construction phase	Noise control through stipulated working hours. Impacts on aspects outside of the demarcated areas reduced.	All machinery and/or plant which radiate noise levels exceeding 85.0Dba to be acoustically screened off; SABS083, SANS 10083 Noise Induced Hearing Loss Regulations, Occupational

				along the boundaries of the site to take place to identify noise intrusions; Berms with a potential to act as a noise barrier should be constructed as soon as possible around open cast pits and other mining activities with the barrier being built as close as possible to the operations or at receptors as is feasible as possible. Construction vehicles and machinery will be regularly maintained to minimise noise generation. 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 on open cast pits		Noise levels on site reduced.	Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational Hygiene Regulations, MHSAct (29 of 1996).

				and stockpile areas.			
Construction Phase	Preparation of the foot print area	Baseline Noise Levels	Increased noise levels off the proposed Site species along the No river downstream of the mine)	**- Minimisation:** It is recommended that the height of the berms/barriers be at least 2 m higher than the line of sight to the highest noise source from open cast pits and stockpile areas, although the higher the berm/barrier the better acoustical screen it will be. Certain heavy vehicles have their exhaust ports above the cabin of the vehicle and needs to be considered as the noise source point.	Construction phase	Impacts on aspects outside of the demarcated areas reduced. Noise levels on site reduced. All machinery and/or plant which radiate noise levels exceeding 85.0dBA to be acoustically screened off;	SABS083, SANS 1 0083. Noise Induced Hearing Loss Regulations, Occupational Health and Safety Act, 1993); (Act No. 85 of 1993 and the Occupational Hygiene Regulations, MHSAct (29 of 1996)
Construction phase	Site clearing, removal of topsoil and vegetation	Air Quality	Variable Dust generation from as land clearing, topsoil removal, loading of material, hauling, grading,	**- Minimisation:** Working areas should be limited to the demarcated construction area only, and vehicular movement must be limited to designated haul roads and	Construction phase	Minimisation of air pollution, particularly windborne particles.	Impacts on aspects outside of the demarcated areas reduced. Compliance with National Dust Control Regulations (GNR

			stockpiling, bulldozing and compaction	construction areas only. - **Remediate:** Disturbed areas should be rehabilitated as soon as possible to limit the development of erosion. Timed blasting when there is no wind, dust suppression on roads, dampening of materials being transported, timeously completion of construction to reduce increased exposure time. Topsoil should not be removed during windy months (August, September and October) due to associated wind erosion heightening dust levels in the atmosphere.			827).
Construction Phase	Site construction and grading	Groundwater quantity	Changes in runoff and infiltration that could reduce	**Control and minimise** : limit the removal of vegetation and	Construction phase	Reduced runoff, soil compaction	Compliance with the National Water Act (36 of 1998) as well as

			groundwater recharge	opportunities for revegetation will be maximised		and revegetation to increase infiltration	compliance with the conditions and requirements of the Water Use License.
Construction phase	Vegetation clearing for open pit excavation, clearing for construction of buildings, roads and other infrastructure, waste dumps etc.	Vegetation	The area for the proposed development will be cleared of vegetation. This will result in the loss of indigenous species, disturbance of species of conservation concern and the fragmentation of plant communities. The removal of vegetation will also expose soil increasing the risk of erosion.	**- Compliance:** Application for a tree removal permit and Avoid planting of exotic plant species	Construction phase	Conservation of protected species, relocation, nursery establishment	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004). National Forests Act, 1998 (Act No. 84 of 1998)

PHASE	ACTIVITY	POTENTIAL IMPACT	ASPECT AFFECTED	MITIGATION MEASURE	TIME PERIOD FOR IMPLEMENTATION	STANDARD TO BE ACHIEVED	COMPLIANCE WITH STANDARDS
Construction phase and decommissioning phase	Stripping, handling and placement of soil associated with pre-construction land clearing and rehabilitation	Soil	Loss of topsoil	**Prevention:** Soils within 100m of the No river should be kept undisturbed. **Minimising During the construction phase**; it is recommended that the topsoil be stripped and stockpiled in advance of construction activities that might contaminate the soil **Rehabilitation:** Due to the shallow nature of the soils it is recommended to strip only 40-60cm of the soil. These	Construction phase and decommissioning phase	Vegetation of topsoil stockpiles, covering the stockpiles and implement concurrent rehabilitation to reduce the exposure of the soil to erosion elements	Rehabilitation targets, closure objectives and endues objectives are met. Conservation of Agricultural Resources Act (No 43 of 1327). Environment Conservation Act (No 73 of 1989).

				estimates take into consideration a possible 10% topsoil loss through compaction and allow the rehabilitated areas to be returned to the pre-mining land capability, i.e. wildlife and gaming.			

PHASE	ACTIVITY	POTENTIAL IMPACT	ASPECT AFFECTED	MITIGATION MEASURE	TIME PERIOD FOR IMPLEMENTATION	STANDARD TO BE ACHIEVED	COMPLIANCE WITH STANDARDS
Construction Phase and operation	Stockpiling of Topsoil	Soil	Loss of topsoil through erosion.	**Control, Minimise and rehabilitate:** Stockpiles can be used as a barrier to screen operational activities. If stockpiles are used as screens, the same preventative measures described above should be implemented to prevent loss or contamination of soil.	Construction, operation, rehabilitation and closure	Vegetation of topsoil stockpiles, covering the stockpiles and implement concurrent rehabilitation to reduce the exposure of the soil to erosion elements	Conservation of Agricultural Resources Act (No 43 of 1327).
Construction Phase and operation	Fuel storage and vehicular movement. Use and	Groundwater quality	Fuel and hydrocarbon leakages and spillages from the transporting vehicles may cause groundwater	**Control and Management:** All storage areas containing hazardous material	Construction, operation, rehabilitation	Implement a rigorous pollution prevention program as	Compliance with the National Water Act (36 of 1998) as well

	maintenance of haul roads (incl. transportation of Minerals to plant		contamination	will have secondary containments of containers the volumes of the largest tank or container plus 10%. Resort to immediate clean-up after accidental spillage. Divert runoff from haul roads that may contain hydrocarbons into lined pollution control dams.	and closure	part of a comprehensive Environmental Management Plan (EMP) and ensure that no pollution whatsoever enters local ground or surface water.	as compliance with the conditions and requirements of the Water Use License.
Construction Phase and operation	Increased excavation processes that may lead to more sediment being deposited into the wetlands	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Construction Phase and	Mine development	Institutional and Empowerment	Attitude formation against project	The attitude formation variable seeks to assess	Construction Phase and operation phase	Increase awareness and	National Environmental

operation phase		Changes Processes		changes relating to attitude formation that could be attributed to the Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine specifically. Attitudes and interest group activity would not constitute impacts per say. It would rather be associated with an appraisal by I&APs of the proposed project, change events and perceived impacts. If such appraisal about the objects of thought (being the		community engagement Appointment of a community liaison officer	Management Act (107/1998).

				project; changes processes or impacts), includes evaluative judgments - positive, negative or neutral, these are by definition, attitudes (in short, how we feel about things).			
Construction and operation phases	Mine development	Sociocultural change process	Crime, Safety and Security	**Control and Prevention:** Fence off servitudes and access roads and provide for strict access control measures to service roads and patrol service roads regularly; Management: Liaise with the South African Police Service to	Construction Phase and operation phase	Conform to the guidelines of the SLP, neighborhood watch, liaise with SAPS	Mining Charter and Mineral and Petroleum Resources Development Act, Act 28 of 2002. National Environmental Management Act (107/1998).

				enhance police patrol activity in the project area;			
Construction and operation phases	Mine development	Sociocultural change process	Integration with local community	**Awareness:** Launch aggressive culturally appropriate STI and HIV/AIDS awareness campaigns; Enhance people's knowledge through awareness campaigns on site, schools and community forums; access control, increased female hires to reduce	Construction Phase and operation phase	Conform to the guidelines of the SLP, Community engagement, SHEQ management objectives	Mining Charter and Mineral and Petroleum Resources Development Act, Act 28 of 2002. National Environmental Management Act (107/1998). Occupational Hygiene Regulations, MHSAct (29 of 1996)
Construction and operation	Mine development	Sociocultural change	Quality of life and sense of place	**Manage** Establishment of an anti-poaching unit available to	Construction Phase and operation phase	Conform to the guidelines of the SLP, neighborhood	Mining Charter and Mineral and Petroleum

phases		process		adjacent land owners, and establishing a security forum in collaboration with these land owners. Land owners are to be actively involved in the selection of the contracting company employed to conduct anti-poaching in the area. Increased security measures (fencing, access control and monitoring) on mine premises;		watch, liaise with SAPS	Resources Development Act, Act 28 of 2002. National Environmental Management Act (107/1998).
Construction and operation	Mine development	Demographic change process	Influx of workers	**Manage:** Local hiring and HR implementing the	Construction Phase and operation phase	Conform to the guidelines of the SLP	Mining Charter and Mineral and Petroleum

phases				SLP, stakeholder engagement			Resources Development Act, Act 28 of 2002
Construction and operation phases	Stockpiling of topsoil	Soil	Mixing of deep and surface soils during handling, stockpiling and subsequent placement. Change to oil's physical, chemical and biological properties due to operational contamination of oils and Iron dust.	**Design and management:** The stockpiles should not exceed a maximum height of 6m and it is recommended that the side slopes and surface areas be vegetated in order to prevent water and wind erosion and to keep the soils biologically active.	Construction Phase and operation phase	Vegetation of topsoil stockpiles, covering the stockpiles and implement concurrent rehabilitation to reduce the exposure of the soil to erosion elements.	Conservation of Agricultural Resources Act (No 43 of 1327).
Construction phase	General transportation, hauling and vehicle movement	Air Quality	Transportation of the workers and materials in and out of mine site will be a constant feature during	**- Minimisation:** Working areas should be limited to the demarcated	Construction Phase	Minimisation of air pollution, particularly Wind-borne	Compliance with National Dust Control

	on site		the construction phase. This will however result in the production of fugitive dust (containing TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads. Dust emissions from haul track,	construction area only, and vehicular movement must be limited to designated haul roads and construction areas only. - **Remediate**: Disturbed areas should be rehabilitated as soon as possible to limit the development of erosion. Timed blasting when there is no wind, dust suppression on roads, dampening of materials being transported, timeously completion of		particles.	Regulations (GNR 827).

				construction to reduce increased exposure time.			

PHASE	ACTIVITY	POTENTIAL IMPACT	ASPECT AFFECTED	MITIGATION MEASURE	TIME PERIOD FOR IMPLEMENTATION	STANDARD TO BE ACHIEVED	COMPLIANCE WITH STANDARDS
Operational phases	Air pollution excavations and construction	Vegetation	The anticipated increase in haul traffic and opencast mining operations will lead to an increased settling of dust on adjacent vegetation. Continued increased levels of dust in the air have an effect on faunal species, particularly birds, but also on fauna species feeding on the vegetation.	Control through a dust suppression. **Minimising and monitoring:** This program should include (but not be limited to) the following measures: a) Shield stockpiles from predominant wind directions; b) vegetate areas and ensure continual capping and vegetation of the sides of mine residue facilities; c) regular spraying; d) continuously remove Iron form site and reduce long-term stockpiling; e) clear Iron spillages from site	Operational phase	Minimisation of air pollution, particularly wind-borne particles.	Impacts on aspects outside of the demarcated areas reduced. Compliance with the National Dust Control Regulations (GNR 827).
Operational phases	Alien Invasive	Vegetation	Alien invasive plant species will encroach into disturbed areas. It	Control through Management and Monitoring and implementation of an alien invasive management	Operational Phase	Removal of alien invasive species	The distribution of weeds and invasive

	Plant species on cleared areas (Haulage vehicles and human activities)		is expected that extensive area will be disturbed, natural vegetation totally destroyed.	plan. Remediation Alien species removal programme must be developed and implemented		including managing the distribution of weeds and invasive species avoided.	species avoided. Compliance with the National Environmental Management: Biodiversity Act 10 of 2004 and the Alien and Invasive Species Lists, 2014. Compliance with the National Water Act (36 of 1998) as well as compliance with the conditions and requirements of the Water

							Use License.
Operational phase	Beneficiation by means of crushing and screening	Air Quality	The crushing process releases fugitive dust, especially if there are no enclosure and water sprays. Dust contained within the RoM ore can be released into the atmosphere during this process i.e. fugitive dust (containing TSP, as well as PM10 and PM2.5). Wind erosion from stockpiles can be a perennial source of dust if not properly managed during and post mining operations.	**Minimisation:** Working areas should be limited to the demarcated construction area only, and vehicular movement must be limited to designated haul roads and construction areas only. **Remediate:** Disturbed areas should be rehabilitated as soon as possible to limit the Development of erosion. Timed blasting when there is no wind, dust suppression on roads, dampening of materials being transported, timeously completion of construction to reduce increased exposure time thus it may be necessary to provide air conditioning so the operator has no need to open doors or windows.	Operational phase	Minimisation of air pollution, particularly Wind-borne particles. Impacts on aspects outside of the demarcated areas reduced	Compliance with National Dust Control Regulations (GNR 827).
Operational	Change in	Loss of avian	Avian habitats,	**Control through legislative**	Operational phase	No	Legal

phase	land use (open cast mining areas)	habitats.	including mopane woodland, scrub and open areas will be destroyed by the proposed mine. The area required for mining and infrastructure is 5.5ha. This will represent a significant loss of habitat in a region of high conservation significance, and will affect a number of red-listed species, including several raptors.	**compliance:** Tree removal permit. Prevention. A specialist must be engaged to check the entire property for active nests of red-listed species, such as Whiteback Vulture, Martial Eagle and Tawny Eagle.		unauthorised vegetation clearing. Areas cleared for mining operations must be minimised.	Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).
Operational phase	Change in land use (open cast mining areas)	mammal and herpetofauna	Total or near-total irreplaceable loss of mammal and herpetofauna species is anticipated	- Minimise: Limit all developments to the minimum area required, and leave as much as possible natural vegetation intact.	Operational Phase	No unauthorised vegetation clearing. Areas cleared for mining operations must be	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).

						minimised.	
Operational phase	Continued mining activities	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Operational phase	Generation of stockpiles and associated mining waste	Air Quality	Dust generated from waste rock, evaporation of hydrocarbon fuels from storage tanks and spillages, waste oils chemicals plus hazardous waste	**Control and Minimisation** through the demarcated of operational areas, and vehicular movement must be limited to designated haul roads and construction areas only. **- Remediate:** Reduce stockpiles and ROM exposure time and dampening of materials being transported	Operational Phase	Minimisation of air pollution, particularly windborne particles through rehabilitated as soon as possible to limit the development of erosion.	Impacts on aspects outside of the demarcated areas reduced. Compliance with National Dust Control Regulations (GNR 827).
Operational phase	Hauling of ore to siding or via road	Baseline Noise	Levels Increased noise levels along the feeder roads	**Manage:** To mitigate the impact of over mass and overweight deliveries to the Site, a suitable entrance should be constructed on the D3256 North Road that complies with RTA requirements for site access. Following site construction, the specialized intersection would be utilised for	Operational Phase	An individual Traffic Control Plan would be developed and implemented for each over mass and overweight delivery taking into account the	National Environmental Management Act, Air Quality Act (NEMAQA) (Act No. 39 of 2004); Southern African Road Safety Manual

				emergency vehicle access only.		specialized mine route requirements	(National Department of Transport 1999)
Operational phase	Human activities	Fauna	In addition to direct habitat loss, the disturbance of birds and other vertebrate fauna species in the surrounding areas will increase. This impact will be manifested both directly (e.g., increased poaching pressure and disturbance of nests) and indirectly (changes in prey availability, nesting material, etc.). Given the limited Background information available, the impact assessment here	**Minimise:** Measures must be put in place to ensure that no illegal hunting of birds takes place on the mine property or in surrounding areas.· A specialist must be engaged to check the entire property for active nests of red-listed species, such as Whiteback Vulture, Martial Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to ensure that breeding birds are not disturbed.	Operational Phase	Manage and control illegal hunting activities. A specialist must be engaged to check the entire property for active nests of red-listed species, such as White-back Vulture, Martial Eagle and Tawny Eagle. Any such nests will need a buffer zone of 500 m radius around them to	Legal Compliance National Environmental Management: Biodiversity Act (No 10 of 2004).

			pertains to the worst case scenario.			ensure that breeding birds are not disturbed.	
Operational phase	Human dispersal of alien seeds / sampling by vehicles, shoes, clothes	Pans	No pans were identified within the study area.	N/A	N/A	N/A	N/A
Operational phase	Mining activities area	Baseline Noise Levels	Increased noise levels on the proposed site	Minimise operation to day time 6am to 6pm	Operational phase	Noise control through stipulated working hours. Impacts on aspects outside of the demarcated areas reduced. Noise levels on site reduced	No noise impact after hours. Impacts on aspects outside of the demarcated areas reduced.
Operational	Mining	Visual Impact	Operational Phase	**Control:**	Operational	Reduced visual	Guideline for

phase	infrastructure	of Night time Illumination	Reduction in visual resource value due to Night-time illumination	Consider the application of motion detectors to allow the application of lighting only where and when it is required. **Minimising :** Sources of light must as far as possible be shielded by physical barriers such as a planted trees and shrubs or built structures, where possible, natural vegetation around the Nakedi Solutions Iron Mine should be retained so as reduce unnecessary illumination and “light spill”. All lighting must be installed at downward angles.	phase	impacts on the site, adjacent landowners and residents	Involving Visual and Aesthetic Specialists in EIA Processes

I) Financial Provision

(1) Determination of the amount of Financial Provision.

(a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

Rehabilitation measures have been designed to meet closure objectives:

The objectives of rehabilitation and closure are:

- To ensure closure complies with the Mineral and Petroleum Resources Development Act 28 of 2002.
- To ensure that the mining activities footprints are rehabilitated to an acceptable standard, where there is ecosystem functioning and that all environmental and social risks have been reduced and do not pose any threat to the environment post mine-closure.
- To ensure that the goals which were specified in the rehabilitation plan have been met and that the land may have a sustainable use.
- To implement management strategies that will ensure that the negative impacts (risks) associated with the Nakedi Solutions mining is eliminated or minimized to acceptable standards.
- To leave the area in a manner that is environmentally safe and does not pose any health risks to the neighbouring communities.

CALCULATION OF THE QUANTUM (REAL RATES)

Applicant: NAKEDI SOLUTIONS (PTY) LTD — Ref No.: LP10218MR
Evaluators: DMRE LIMPOPO — Date: Mar-22

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	500	17,4	1	1	8700
2 (A)	Demolition of steel buildings and structures	m2	500	238,71	1	1	119355
2(B)	Demolition of reinforced concrete buildings and structures	m2	1000	351,79	1	1	351790
3	Rehabilitation of access roads	m2	1000	42,72	1	1	42720
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	0
5	Demolition of housing and/or administration facilities	m2	500	477,42	1	1	238710
6	Opencast rehabilitation including final voids and ramps	ha	2	242984,15	1	1	485968,3
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	2	166847,44	1	1	333694,88
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,2	207805,47	1	1	41561,094
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,2	603565,59	1	1	120713,118
9	Rehabilitation of subsided areas	ha	0,2	139709,6	1	1	27941,92
10	General surface rehabilitation	ha	0	132171,31	1	1	0
11	River diversions	ha	0	132171,31	1	1	0
12	Fencing	m	1000	150,77	1	1	150770
13	Water management	ha	0	50255,25	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,2	17589,34	1	1	3517,868
15 (A)	Specialist study	Sum	180000	0	1	1	180000
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		**2105442,18**

1	Preliminary and General	252653,0616	weighting factor 2 1	**252653,0616**
2	Contingencies	210544,218		**210544,218**
			Subtotal 2	**2568639,46**
			VAT (15%)	**385295,92**
			Grand Total	**2953935**

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Environmental objectives in relation to closure are being included as part of the consultation process with the landowner, Interested and affected parties as well as organs of state. The Draft Environmental Impact Assessment Report was made available for public review until the 8th of May 2022, it is however still on-going in order to address issues which were not addressed within the 30 days given to all I&APs. Any I&APs will therefore have the opportunity to submit their comments on the Environmental Impact Assessment Report which will be incorporated into the Final document for submission to the DMR.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

❖ **REHABILITATION PLAN**

This plan includes an overall rehabilitation strategy for the Nakedi Solutions' Mine which provides reference to the planned rehabilitation of the final landforms related facilities and infrastructure. The areas to be rehabilitated include but not limited to Open Pit mining areas, Stockpile areas, Tailings Storage Facility (TSF and Related infrastructure areas (workshops, roads, etc.).

Key aspects relating to the Nakedi Solutions mine site rehabilitation:

- The control and management of mine waste (i.e. overburden, coarse rejects and fine tailings);
- Proposed rehabilitation methods;
- The management of topsoil resources for use in rehabilitation of the site;
- Description of the planned progressive re-vegetation of areas across the mine site;
- The integration with on-going and future rehabilitation activities across the wider mining area; and
- Rehabilitation monitoring and maintenance requirements which may apply.

Rehabilitation of all affected areas due to the mining and related activities will proceed as soon as such areas become available for rehabilitation. The rehabilitation of disturbed land at the mine site will be conducted so that:

- Suitable species of vegetation are sown/planted and established to achieve the nominated post-mine land uses;
- The potential for water and wind induced erosion is minimised, including the likelihood of environmental impacts being caused by the release of dust;
- The quality of surface water released from the site is such that releases of contaminants are not likely to cause environmental harm;
- The water quality of any residual water bodies (other than the final void) is suitable for the nominated use and does not have the potential to cause environmental harm; and
- The final landform is stable and not subject to slumping, subsidence, or erosion which will result in the agreed post mining landform not being achieved.

Please note that there could be certain instances where rehabilitation may be delayed due to interactions with other nearby areas that are unavailable for rehabilitation or activities that will negatively impact the area. Where this is the case, temporary rehabilitation methodologies may be applied to provide short-term stabilization of the areas.

The mining reserves will be mined by employing the drill and blast, truck and shovel opencast method of mining due to the reserves being shallow. Various box cuts located on site have been designed in the mine layout including re-opening old pits which were not rehabilitated.. This design has ensured that the hauling of overburden material over excessive distances, even during the start-up period, will be largely minimised. Rollover of overburden material will be implemented after the first strip has been mined. Drilling and blasting will be undertaken for hard material. Rehabilitation will form an integral part of the mining process.

The stripping and stockpiling of topsoil is the most important step in any rehabilitation program and must commence before any minerals are extracted from the intended area of disturbance. Prior to the commencement of minerals extraction, the site will be cleared and grubbed.. Ideally, topsoil should not be worked when wet and prolonged storage should be avoided. In this way the valuable topsoil, an ideal medium for plant growth, will become available for rehabilitation purposes at the site as mining advances.

As mining advances, topsoil, subsoil and overburden will initially be shifted and stockpiled outside the boundaries of the pit and will then subsequently be shifted to mined-out areas.

Rehabilitation will form an integral part of the mining process and final rehabilitated land will be done once mining has been done and the pits backfilled. The movement and stockpiling of topsoil at the Nakedi Solutions' mine project will take place as follows to ensure that progressive rehabilitation takes place during all phases of mining.

i) Initial area to be mined

All identified topsoil, to a minimum depth of 300mm, will be removed from the area identified as the initial box cut and stockpiled at the areas marked as Topsoil Stockpile, adjacent to the pits before the next phase of mining is initiated. This soil will subsequently be spread back over the pit area marked for the initial box cut to a depth of at least 300mm after the area has been mined, while some of the areas have limited topsoil due to the presence of an outcrop, this must also be taken into account.

The following basic principles of rehabilitation form the basis of the roll-over mining method:

- Prepare a rehabilitation plan prior to the commencement of mining and take photographs of the area before mining commences;
- Agree on the long-term post - mining land use objective for the area with the relevant government departments, local government councils and private landowners. The land use must be compatible with the climate, soil, topography of the final landform and the degree of the management available after rehabilitation;

- Progressively rehabilitate the site, where possible, so that the rate of rehabilitation is similar to the rate of mining;
- Prevent the introduction of noxious weeds and pests;
- Minimise the area cleared for mining and associated facilities to that absolutely necessary for the safe operation of the mine;
- Reshape the land disturbed by mining so that it is stable, adequately drained and suitable for the desired long-term land use;
- Minimise the long-term visual impact by creating landforms which are compatible with the surrounding landscape;
- Reinstate natural drainage patterns disrupted by mining wherever possible;
- Minimise the potential for erosion by wind and water both during and following mining;
- Characterise the topsoil and retain it for use in rehabilitation. It is preferable to reuse the topsoil immediately rather than storing it in stockpiles. Only discard if it is physically or chemically undesirable, or if it contains high levels of weed seeds or plant pathogens;
- Consider spreading the cleared vegetation on disturbed areas;
- Deep rip compacted surfaces to encourage infiltration, allow plant root growth and key the topsoil to the subsoil, unless subsurface conditions dictate otherwise;
- Ensure that the surface one or two metres of soil is capable of supporting plant growth;
- If topsoil is unsuitable or absent, identify and test alternatives substrates, e.g. overburden may be a suitable substitute after addition of soil improving substances;
- Re-vegetate the area with plant species consistent with the post mining land use; and
- Monitor and manage rehabilitation areas until the vegetation is self-sustaining.

Rehabilitation activities during the decommissioning phase should adhere to the following guidelines:

ii) Site grading

The local environment in un-rehabilitated disturbed mining areas is unfavorable to vegetation establishment. Lack of topsoil, combined with uneven and often quite steep slopes hinders plant germination and establishment. While the disturbed slopes are being graded, care must be taken to ensure proper drainage of the site. Consideration should at this time be given to the creation of berms at the pit entrance, to screen the site and to prevent further unauthorized access.

iii) Spreading of stored topsoil

Once the disturbed area's – box cuts as well as the new pit area - backfilling, grading and sloping is complete, subsoil and topsoil from storage berms located outside the mining area should be spread on the slopes as evenly as possible. When this has been completed, the next stage in the rehabilitation program should immediately commence to prevent erosion and topsoil loss.

Decommissioning and closure will entail the following:

- Slope and whaleback the slopes of both the old box cuts as well as the new pits to a gradient of at least 1:6, in order to accommodate any future agricultural activities within the area;
- The topsoil will be stockpiled as detailed in the previous section;
- Topsoil will be spread out over prepared areas to a depth of no less than 300mm, unless otherwise stated (see the 'topsoil stockpiling' section above);
- Neat stockpiling of oversized rock in the one corner of the pit or alternatively clustering rocks on long slopes with gradients of 1:6 to reduce erosion through water run-off and facilitate plant growth by providing seedlings and seeding of the disturbed area;
- Remove the concrete/impermeable floor where refuelling occurred;
    - ✓Remove all containers;
    - ✓ Decontaminate any hydrocarbon spills by removing the soil and disposing of it at a licensed disposal facility;
    - ✓Remove the temporary fencing;
    - ✓ Maintain the area by doing regular site inspections ensuring the establishment of vegetation and the eradication of alien invader species; and
    - ✓Reinstate natural drainage patterns disrupted by mining wherever possible.

All of the topsoil must be utilised as a growing medium in the rehabilitation process of the site, in other words it must be spread over all prepared areas (ripped to a depth of 300mm and sloped) and be re-vegetated with seeds found within the area or prepared in such a way as to satisfy the agricultural requirements of the area and/or the land owner.

It is imperative that rehabilitation occurs concurrently with mining activities, as topsoil, containing seeds from plants within the area, degrades over time with the result that the soil environment becomes unfavorable for germinating seeds in the event that concurrent rehabilitation cannot happen, this must be done at the end of the mining.

iv) Final Closure

The closure objective is to ensure that all the significant impacts have been mitigated against. All rehabilitated areas will be left in a stable, self-sustainable state. Proof of this will be submitted at closure. The closure objectives for the Nakedi Solutions' summarised as follows:

- Make all areas safe for both humans and animals;
- Make all areas stable and sustainable;
- Ensure impact on any water bodies, water courses and catchment areas have been avoided or minimised;
- Rehabilitate disturbed areas as soon as possible; and
- Leave the area suitable for the activity it was being used for before (grazing) if not better

With specific reference to the ground water environment, the following closure objectives should be pursued:

- Rehabilitation of the surface infrastructure where necessary to minimize infiltration into the underground water regime (the philosophy of concentration and containment); and
- Rehabilitation to minimise contamination of surface water resources (the philosophy of dilution and dispersion).
- Monitor the area even after rehabilitation

When and if necessary suitable structures and or systems are to be put, and kept in place to limit contamination of water resources, and to limit parameter concentrations in accordance with the Target Water Quality Ranges for human consumption.

The goals upon decommissioning and closing of the mine will include that all significant impacts have been mitigated and that there are no alterations to the environment that are apparent as far as is practically possible. All land will be rehabilitated to a state that facilitates compliance with current national environmental quality objectives including air quality objectives and water quality guidelines.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

Describe and ensure that the rehabilitation plan is compatible with the closure objectives determined in accordance with the baseline study as prescribed.

The rehabilitation plan has been developed specifically to meet the closure objectives for this project.

Final end land use: - Agricultural activity

Environmental objectives:

- The mining area will be rehabilitated to ensure a free-draining landform and the area will be shaped in order to promote unrestricted drainage throughout the rehabilitated area, thus limiting water-logging and slumping.
- After direct placement of topsoil, the area will be profiled to a free-draining landform.
- The soils will be ripped, treated and re-vegetated using a natural grass, shrub and tree mixture, although we should note that the area does not have good soil but rather sandy soil in the area.
- The re-vegetation must use indigenous seed mix (such as Erogrostis cuvula, Eraqrostis teff, Cynadon dactylon, Digitaria erianthra and Chloris gayana) which restores the land to a stable and non-erodible land form.
- The rehabilitated areas will be monitored for declared weeds and invasive plants. This will be controlled and managed as per the normal procedure.
- With proper rehabilitation and fertilisation techniques, this can be reduced to a minimum to ensure that the rehabilitated area is sustainable and will not degrade further due to erosion.
- Allowance will be made for a maintenance period of 2 to 3 years after care following rehabilitation.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

R2 953 935

CALCULATION OF THE QUANTUM (REAL RATES)

Applicant: **NAKEDI SOLUTIONS (PTY) LTD** Ref No.: **LP10218MR**
Evaluators: **DMRE LIMPOPO** Date: **Mar-22**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	500	17,4	1	1	8700
2 (A)	Demolition of steel buildings and structures	m2	500	238,71	1	1	119355
2(B)	Demolition of reinforced concrete buildings and structures	m2	1000	351,79	1	1	351790
3	Rehabilitation of access roads	m2	1000	42,72	1	1	42720
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	414,61	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	226,15	1	1	0
5	Demolition of housing and/or administration facilities	m2	500	477,42	1	1	238710
6	Opencast rehabilitation including final voids and ramps	ha	2	242984,15	1	1	485968,3
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	2	166847,44	1	1	333694,88
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0,2	207805,47	1	1	41561,094
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0,2	603565,59	1	1	120713,118
9	Rehabilitation of subsided areas	ha	0,2	139709,6	1	1	27941,92
10	General surface rehabilitation	ha	0	132171,31	1	1	0
11	River diversions	ha	0	132171,31	1	1	0
12	Fencing	m	1000	150,77	1	1	150770
13	Water management	ha	0	50255,25	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0,2	17589,34	1	1	3517,868
15 (A)	Specialist study	Sum	180000	0	1	1	180000
15 (B)	Specialist study	Sum	0	0	1	1	0
					Sub Total 1		**2105442,18**

1	Preliminary and General	252653,0616	weighting factor 2 1	**252653,0616**
2	Contingencies	210544,218		**210544,218**
			Subtotal 2	**2568639,46**
			VAT (15%)	**385295,92**
			Grand Total	**2953935**

(f) Confirm that the financial provision will be provided as determined.

Yes, this amount will be available when the competent authority requests for such a guarantee or payment.

(g) Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including

Monitoring of Impact Management Actions

Monitoring and reporting frequency

Responsible persons

Time period for implementing impact management actions

Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Decommissioning activity	Air quality dust	Monitoring will require watering the area before operating on site	Applicant will appoint qualify person	Weekly
Decommissioning activity	Water quality (surface and ground water)	Filled damp will be created on site to avoid runoff to the near river	Applicant will appoint qualify person	Monthly
Decommissioning activity	Noise	No operation will take place during the night. And noise will be monitored on site	Applicant will appoint qualify person	Fortnightly
Decommissioning activity	Cracking of soil and infrastructure	Daily assessment to see if there is crack on soil and infrastructures on site.	Applicant will appoint qualify person	Fortnightly
Decommissioning activity	Daily assessment to see if there is crack on soil and infrastructures on site.		Applicant will appoint qualify person	Monthly

The existing management team at the Nakedi Solutions' Mine will oversee the proposed mining operations. The key personnel to ensure compliance with this EMP report will be the operations executive, the environmental manager and the stakeholder development manager. As a minimum, these roles as they relate to the implementation of monitoring programmes and management activities will include:

- Environmental site manager:
  - ensure that the monitoring programmes and audits are scoped and included in the annual mine budget;
  - identify and appoint appropriately qualified specialists/engineers to undertake the programmes;
  - appoint specialists in a timeously manner to ensure work can be carried out to acceptable standards;
- Human Resource department:
  - manage labour-related aspects for the mine;
  - liaise with the relevant structures in terms of the commitments in the SLP;
  - ensure that commitments in the SLP are developed and implemented in a timeously fashion;
  - establish and maintain good working relations with surrounding communities and landowners;
  - facilitate stakeholder communication and information-sharing mechanisms (quarterly stakeholder meetings will be held as a minimum); and
  - Facilitate grievance mechanism.
  - Facilitate compliance to the SLP
  - Ensure smooth relationship between the competent authority, mine as well as the community within the project area.

(h) Indicate the frequency of the submission of the performance assessment report.

Yearly performance/environmental audits will be compiled for the rehabilitation and removal of species on the mining area.

Nakedi Solutions' environmental management team will conduct internal performance assessments of the EMP on an annual basis and they will appoint an independent suitably qualified specialist to conduct an EMP performance assessment and compile a report, annually.

The performance assessment will include the following:

- A desktop assessment of the approved EMP.
- Site inspection.
- Evaluation of management measures.
- Information gathering and collation.
- Verification of compliance status.
- Compilation of a performance assessment report.

The performance assessment report will include:

- Method and procedure statement.
- Qualifications and experience of audit team.
- Percentage compliance with EMP measures.
- Motivation of findings.
- Recommendations pertaining to major non-compliances noted.

The performance assessment report will provide:

- Provision of appropriate information to the management of the mine.
- The establishment and updating of the financial provision.
- Recommendations for the initiation of corrective action plans.

The independently compiled performance assessment report will be reviewed by the environment management team and once finalized a copy of the report will be submitted to the DMRE and proof of submission should be received. The environmental manager should ensure corrective actions are implemented in order to rectify areas of non- compliance.

(i) Environmental Awareness Plan

The ESO and/or ECO must be conversant with all legislation pertaining to the environment applicable to this contract and must be appropriately trained in environmental management and must possess the skills necessary to impart environmental management skills to all personnel involved in the project.

Nakedi Solutions shall ensure that adequate environmental training takes place. All employees shall have been given an induction presentation on environmental awareness. Where possible, the

presentation needs to be conducted in the language of the employees. The environmental training should, as a minimum, include the following:

- The importance of conformance with all environmental policies.
- The significant environmental impacts, actual or potential, as a result of their work activities.
- The environmental benefits of improved personal performance.
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures, and with the requirement of Nakedi Solutions environmental management systems, including emergency preparedness and response requirements.
- The mitigation measures required to be implemented when carrying out their work activities.
- The importance of not littering.
- The need to use water sparingly.
- Details of, and encouragement to, minimise the production of waste and re-use, recover and recycle waste where possible.

Recommended Basic Environmental Education Material is provided.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes shall contain the following information:

- The names, positions and responsibilities of personnel to be trained.
- The framework for appropriate training plans.
- The summarised content of each training course.
- A schedule for the presentation of the training courses.

The Nakedi Solutions Iron Mine shall ensure that records of all training interventions are kept in accordance with the record keeping and documentation control requirements as set out in this Environmental Impact Assessment Report and Environmental Management Programme Report (EIAR & EMPr). The training records shall verify each of the targeted personnel's training experience. The ECO shall monitor the records and listed and undertake regular follow ups.

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

IMPACT	MONITORING & REPORTING TIMEFRAME
Air quality (dust)	Weekly
Water quality (Ground & Surface water)	Monthly
Noise	Fortnightly
Cracking of soils & infrastructure	Fortnightly
Loss of current land use	Monthly
Loss of income	Whenever new staff is required
Performance assessment report	Bi-annually

This section includes an environmental awareness plan for the mine. The plan describes how employees will be informed of environmental risks which may result from their work, the manner in which the risk must be dealt with in order to avoid pollution or degradation of the environment and the training required for general environmental awareness and the dealing of emergency situations and remediation measures for such emergencies.

All contractors that conduct work on behalf of Nakedi Solutions are bound by the content of the EMP and a contractual condition to this effect will be included in all such contracts entered into by the mine. If contractors are used, the responsibility for ensuring compliance with the EMP will remain with the Nakedi Solutions.

The purpose of the environmental awareness plan is to ensure that all personnel and management understand the general environmental requirements of the site. In addition, greater environmental awareness must be communicated to personnel involved in specific activities which can have a significant impact on the environment and ensure that they are competent to carry out their tasks on the basis of appropriate education, training and/or experience.

The environmental awareness plan should enable Nakedi Solutions' Mine to achieve the objectives of the environmental policy;

- On a regular basis, all aspects of the operation will be checked against the prescripts of the EMP and its supporting procedures and, if established that certain of the aspects are not addressed or impacts on the environment are not mitigated properly, it will be immediately communicated to the operational team by management.
- Should the mitigation measure not be in line with the prescripts, amendments will be made and the employees will be made aware of the changes and encouraged to adhere to such.
- All site personnel will be inducted at the site and will be taken through the EMP and other relevant legal requirements to familiarize them with same.
- Simplified signaling will be placed on site to sensitize the workers of the legal requirements attached to this EMP.

Table 2-5: Awareness Training Plan

ITEM	ASPECTS / CONTENT	TIMEFRAMES
Induction & refresher training (Basic awareness training for all prior to granting access to site (e.g. short video presentation requiring registration once completed). Employees and contractors who have not attended the training will not be allowed on site;	• EMP document • Legal requirements • First Aid • Safety	• Before commencement of works • Upon return to work after more than a 3-week vacation
Task briefings and weekly review meetings.	• Allocation of tasks with environmental-related • Themes Review of achievement and implementation	Daily and weekly
SHE induction (Safety, Health and Environment)	Personnel who will be on site for more than five days must undergo the SHE induction training;	• Before commencement of works • Upon return to work after more than a 3-week vacation
Signage awareness (aide memoire)	Manual / List of signs Newsletters	Monthly
Specific environmental awareness training	**Procedures and standards:** Training will be provided to personnel whose work activities can have a significant impact on the environment (e.g. workshops, waste handling and disposal, sanitation, etc.).	Once every quarter

To achieve the objectives of the environmental awareness plan the general contents of the training plans are as follows:

- Module 1 – Basic training plan applicable to all personnel entering the site:
  - Short (15min) presentation to indicate the site layout and activities at specific business units together with their environmental aspects and potential impacts; and
  - Individuals to sign off with site security on completion in order to gain access to the site.
- **Module 2** – General training plan applicable to all personnel at the site for longer than five days:
  - General understanding of the environmental setting of the mine (e.g. fauna and flora);
    - Understanding the environmental impact of individuals activities on site (e.g. excessive production of waste, poor housekeeping, energy consumption, water use, noise, etc.);
  - Indicate potential site specific environmental aspects and their impacts;
  - Nakedi Solutions ’s environmental management strategy;

- Identifying poor environmental management and stopping work which presents significant risks;
- Reporting incidents;
- Examples of poor environmental management and environmental incidents; and
- Procedures for emergency response and cleaning up minor leaks and spills.

❖ **Module 3** – Specific training plan:

Environmental setting of the workplace (e.g. proximity of watercourses, vulnerability of groundwater, proximity of local communities and industries, etc.);

- Specific environmental aspects such as:
  - Spillage of hydrocarbons at workshops;
  - Spillage of explosive liquids in the open pits;
  - Poor waste management such as mixing hazardous and general wastes, inappropriate storage and stockpiling large amounts of waste;
  - Poor housekeeping practices;
  - Poor working practices (e.g. not carrying out oil changes in designated bunded areas);
  - Excessive noise generation and unnecessary use of hooters; and
  - Protection of heritage resources (including paleontological resources).
- Impact of environmental aspects, for example:
  - Hydrocarbon contamination resulting in loss of resource (soil, water) to downstream users;
    i. groundwater contamination also resulting in loss of resource due to potential adverse aesthetic, taste and health effects; and
    ii. Dust impacts on local communities (nuisance and health implications).
- Nakedi Solutions ’s duty of care (specifically with respect to waste management); and purpose and function of Nakedi Solutions ’s environmental management system

Individuals required to complete **Module 3** (Specific training module) will need to complete **Modules 1 and 2** first. On completion of the **Module 3**, individuals will be subject to a short test (written or verbal) to ensure the level of competence has been achieved. Individuals who fail the test will be allowed to re-sit the test after further training by the training department. The actual contents of the training modules will be developed based on a training needs analysis.

Key personnel will be required to undergo formal, external environmental management training (e.g. how to operate the environmental management system, waste management and legal compliance).

In addition to the above Nakedi Solutions’ Iron ore, Manganese, Gemstone and Silica Mine will:

- Conduct refresher training/presentations on environmental issues for mine employees (permanent and contractors) at regular intervals;
- Promote environmental awareness using relevant environmental topic posters displayed at strategic locations on the mine. These topics will be changed monthly, and will be reviewed annually by the Environmental Manager to ensure relevance; and

- Participate and organize events which promote environmental awareness, some of which will be tied to national initiatives e.g. National Arbour Week, World Environment Day and National Water Week.

a. Environmental awareness training

This training will be provided to the various sections of the mine including processors and operators during the safety toolbox sessions and hence it will be on-going. The training programme and subsequently the training will be updated as and when necessary to keep everyone informed of latest developments.

Table 2-6: Training Targets & Standards

TYPE OF TRAINING	TRAINING TARGETS	STANDARDS
• ***Induction programme*** – legal aspects • ***Specific environmental aspects*** - waste, water, hydro carbons, dust, material handling rehabilitation • ***Competency*** • ***Health and safety*** – dust management, emergency preparedness, first aid. • ***Fauna and flora protection***	• Management • Supervisors • Operators • Visitors • Contractors	• Records • Standard operating procedures • Signage • Personal Protection • Equipment

i. Induction Programme

The mine will develop an induction programme that will include the EAP. Various topics will be covered during the training sessions/induction e.g. environmental housekeeping, dust minimisation, etc. It will be the responsibility of the mine manager to ensure that all employees are inducted and this will include inter alia;

- Administrative requirements and procedures including environmental emergency procedure;
- Resource conservation and environmental reporting including other general environmental issues that require awareness raising

All new employees joining the mine after operations have started shall undergo induction as well. The induction programme (including the environmental section) shall be updated on an annual basis to ensure that trends are followed and latest developments e.g. policies are also included.

ii. Description of solutions to risks

The above-mentioned management measures will be adhered to and all necessary action will be taken to immediately implement corrective action when an incident occurs. Each activity and associated risks are linked in aspect and impact register to relevant procedure to prevent incidental impacts. Compliance to these procedures should be seen as the duty of all staff and contractors.

Management will monitor that these procedures are adhered to and the EMP is implemented.

Table 2-7: Risk and Mitigation

RISK	CAUSE	CONTROLS / MITIGATION ACTION
Veld fires	Smoking and discarding matches in the field	Maintain visual awareness of surroundings; smoking only in designated areas; keep a fire extinguisher on site
Property damage	• Reckless driving; • Driving over vegetation;	• Follow designated routes / pathways • Awareness training • Proper signage
Damage to field equipment and tools	• Vehicles getting stuck in loose sands • Improper use of equipment	• Follow designated routes / pathways • Awareness training • Proper signage • Training on use of equipment
Stock / agricultural produce theft/ illegal hunting by employees	Trespassing of employees onto agricultural land	• Constant supervision of staff • Staff will not live on site • Prevent access by public
Soil erosion on site	Trampling by employees and vehicles	Personnel will be restricted to 25m radius of borehole, away from gullies, wetlands or river banks
Damage to vegetation	Off-road driving to camp and borehole sites	Where off road driving is necessary, attempts will be made to follow existing fence lines and animal track at every possible opportunity
Flooding Times of high runoff	Climate change	Establish camp on high ground away from river or water courses
Illnesses	Contaminated water	Safe drinking water must be supplied

iii. Training Records

Environmental awareness and training records will be kept at a safe and accessible place within the mine.

iv. Review of Awareness and Training Material

The contents of all awareness and training material shall be reviewed and updated at least ones a year.

(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

For this proposed mining work all the plant which was removed during the course of operations will be replanted. The contractors employed for the rehabilitation and removal of waste will be informed by their employer. Pollution and degradation of the environment will be monitored in this prospecting right application. Where there is deforestation afforestation will take place and littering of materials in the site will be prohibited in this application.

Furthermore, the Health, safety, environmental and community issues were considered as part of the development of the emergency and remediation procedures:

- Health issues: Water pollution, creation of dust, gases, chemicals, radiation and noise, as well any ergonomic problems associated with the equipment used at the mine;
- Safety issues: Revealing hazards, which may be present in the equipment, operating procedures, and work systems which could result in physical harm to mine employees or visitors;
- Environmental issues: Identification of all hazardous substances, hydrocarbon spillage and contamination, uncontrolled discharge, pollution, soil erosion, poor water management, overloading of trucks, poor maintenance of equipment and infrastructure.
- Community issues: Any adverse effects that site operations may have on the surrounding communities e.g. water quality, water quantity, noise, dust, erosion, etc.

The objectives of the Emergency Procedures are:

- To ensure emergency preparedness and a quick response in case of any emergency (the emergency and remediation procedures should be followed immediately after an unforeseen event to minimise any additional damage to the environment);
- To provide guidance to Nakedi Solutions' Mine operations in order to meet the minimum legal framework to ensure effective environmental management whereby environmental impacts are minimised and environmental obligations are met;
- To co-ordinate the activities of all persons that have duties to perform during the emergency; an
- To ensure compliance with all applicable environmental legislation.

i *Legal Requirements*

The legal requirements represent the relevant legislation applicable, at the time of compilation of this EMPR, to the formation of this emergency procedures plan. The content of this section of the EMPR will be reviewed in terms of its applicability to legislation and changes thereto, every two (2) years.

Table 2-8: Applicable legislation (to the emergency preparedness and response procedure).

ACT / REGULATION	DESCRIPTION
NEMA (1998) as amended in December 2014	**Section 28** of the NEMA (1998) describes the duty of care of individuals and the remediation of environmental damages.
NEMA (1998) as amended in December 2014	**Section 30** of the NEMA (1998) stipulates specific requirements with regards to the control of emergency incidents.
NWA (1998)	**Section 19** of the NWA (1998) describes pollution prevention and remedying the effects of pollution.
NWA (1998)	**Section 20** of the NWA (1998) stipulates specific requirements with regards to the control of emergency incidents.
GN 704 under the NWA (1998)	**Regulation 2** of GN 704 describes the actions to be undertaken in the event of an environmental incident.
Part IV of the MPRDA (2004) under the MPRDA (2002)	**Part IV** of the MPRDR (2004) details the pollution control and waste management Regulations under the MPRDA (2002) in terms of: • Pollution control and waste management. • Fire prevention. • Soil pollution and erosion control.

❖ **Possible Environmental Emergency Situations**

An environmental incident can be defined as an unexpected sudden occurrence, including a major emission, fire or explosion leading to serious danger to employees, the public or potentially serious pollution which may impact on the environment.

Possible emergency scenarios that may occur at the project and lead to evacuation include but not limited to the following:

- Uncontrolled / controlled fires.
- Damage or threat of damage to buildings, plant and / or workshops.
- Any threat to property or persons.
- Natural disaster (including heavy rainfall event).
- Evacuation drills.
- Bomb and bomb threat.
- Possible hazardous chemical spill (including hydrocarbons).
- Blasting incidents.
- Covid-19 outbreak on site

❖ **Any other occupational SHE hazard;**

Several possible occupational SHE hazards that may affect the environment that may occur at the Nakedi Solutions' Iron ore, Manganese, Gemstone and Silica Mine have been identified and include, but are not limited to:

- Transport related spillage of carbonaceous materials;
- Slope instability / collapse of high walls;
- Contamination of drinking water;
- Failure of water and / or waste management infrastructure;
- Dusty conditions;
- Blockages of clean water diversion berms / trenches resulting in clean water entering the dirt; and
- Water management areas, or not allowed to freely leave the mine boundary area.

Response to, and Managing of, Environmental Emergency Situations Environmental emergency situations, such as those mentioned above, are effectively managed through:

- Annual safety induction training;
- On-going safety representative training;
- Annual revision of safety induction programme;
- Annual revision of standard operating procedures;
- Immediate reporting of emergency situations;
- Immediate action to contain or minimise the effects of an incident;
- Quality of remediation actions; and
- Accurate reporting and data management.

To avoid injury in the event of an emergency, Nakedi Solutions will establish an exit orderly procedure which all personnel will be inducted on.

ii *Response to Emergencies*

Nakedi Solutions' standard operating procedure should describe the procedure to be followed by the emergency coordinator, in response to an emergency, and is detailed below:

❖ Diary of events:

- Note down all calls made / received, as well as the time;
- Note down all instructions given and time; and
- Note sequence of events.

The nature and extent of every emergency may differ and minor adaptations, changes, or additions will have to be made, as the situation dictates.

Response to identified possible emergencies has been described below;

- Fire and emergency:

- Establish risk to life and property;
- Receive and evaluate the situation;
- Decide on the shutdown of the building and order the evacuation of key operational personnel;
- Keep in constant contact with the environmental co-coordinator in order to establish mechanical and electrical shutdown procedures;
- Advise and maintain contact with management;
- Be responsible for notification to law enforcement agencies;
- Notify and direct the activities of emergency officials and teams;
- Maintain a status list showing each area of the plant, and record the current status of each area;
- Dispatch support services as required;
- Where possible, arrange for a nominated company photographer to record photographs of the damage caused;
- Hand in diary of events; and
- When deemed safe, have employees resume their normal duties.

- Uncontrolled / Controlled fires

In the event of a fire (including veld-fires), the following procedure should be followed by personnel on site:

- Sound the emergency alarms - location of the emergency alarms should be included in the induction program;
- If it is a small non-electrical fire, try to put it out by use water or the nearest fire extinguisher or water. If it is an electrical fire, turn of the power and use the nearest fire extinguisher;
- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property (Risk Assessment should form part of safety induction);
- Contact emergency services, if required;
- In the case of a fire inside a building close all windows and office doors; and
- Exit the building quickly via the nearest exit point to the nearest assembly point.

- Bomb and bomb threat:
  - Stop all machines;
  - Open all doors and windows;
  - Proceed to designated assembly point;
  - Do not run;
  - Do not shout;
  - Do not push past other personnel;
  - Report to the designated assembly point; and
  - Do not return to the office / plant until instructed by the emergency co-coordinator.

- Natural disaster / heavy rainfall event (larger than the design capacity of related infrastructure)

The following preparations may be put in place in case of heavy rainfall events:

- Sound the emergency alarms;
- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required;
- Inform downstream / downslope users;
- Proceed to the nearest assembly point; and
- Should an emergency develop at the pollution control dam, report the emergency to the DWS. A written report shall be provided to the DWS within 14 days (as per GN 704).

It is however important to note that should an emergency (spill from a PCD or PCD wall failure) occur, all contaminated water will remain within the dirty water management area and flow towards the opencast pit areas.

- Possible hazardous chemical spills.

The following procedure should be followed as an initial (immediate) response to any spill:

- Sound the emergency alarms;
- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required;
- Identify areas likely to be affected by the spill;
- Evacuate the area; and
- Proceed to the nearest assembly point.

The following procedure must be followed by an appropriately trained and designated person to manage and remediate the spill as soon as such a person becomes available:

- Remove as much of the spill as possible;
- Prevent further movement of the spill;
- Utilise bioremediation agents and spill kits to remediate the area;
- Dispose of contaminated soils, in accordance with the EMP Amendment and other legislative requirements; and
- Never rinse any hydrocarbons, or any other chemicals that will contribute to pollution of resources, into natural drainage systems.

- Blasting incidents.
  - The following procedure must be followed in case of a Blasting incident:
  - Sound the emergency alarms;
  - Advise and maintain contact with management;

- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required; and
- Proceed to the nearest assembly point.

- Blockages of clean water management infrastructure

The following Procedure must be followed in the initial (immediate) response to the identified blockage:

- Advise and maintain contact with management;
- Identify a risk to life / property;
- Sound the emergency alarm, if required; and
- Proceed to the nearest assembly point, if required.

The following procedure should be followed by an appropriately trained and designated person to manage and remediate the blockage, as soon as such a person becomes available to assist:

- Identify the material causing the blockage;
- Remove as much of the blockage as possible; and
- Inspect clean and dirty water management infrastructure to ensure that there are no further blockages exist.

- Transport related spillage of carbonaceous materials

The following procedure should be followed as an initial (immediate) response to a transport related spillage of carbonaceous materials:

- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required; and
- Proceed to the nearest assembly point, if required

The following procedure must be followed by an appropriately trained and designated person to manage and remediate the spill as soon as such a person becomes available:

- Prevent further movement of the spill;
- Remove and recover as much of the spill as possible;
- Dispose of contaminated soils, in accordance with the Amendment and other legislative requirements; and
- Never rinse any carbonaceous materials, or any other substances that will contribute to pollution of resources, into a water system.

- Slope instability / collapse of high walls

Procedure to be followed in the initial (immediate) response to the identified instability / collapse:

- Advise and maintain contact with management;
- Identify a risk to life / property;
- Sound the emergency alarm, if required; and
- Proceed to the nearest assembly point, if required.

Procedure to be followed by an appropriately trained and designated person to manage instability collapse, as soon as such a person becomes available to assist (external specialist assistance may be required, depending on the nature of the incident):

- Identify the instable area / collapsed area;
- Prevent unauthorized access to this area; and
- Initiate the appropriate techniques to make this area safe.

- Contamination of drinking water

Procedure to be followed in the initial (immediate) response to contamination of drinking water at the site:

- Advise and maintain contact with management;
- Identify injuries and / or a risk to life; and
- Contact emergency services, if required.

Procedure to be followed by an appropriately trained and designated person to manage the contamination of drinking water:

- Advise employees not to utilise the contaminated drinking water;
- Ensure notices are placed at each location where such contaminated water might be available;
- Supply an additional source of clean drinking water;
- Initiate an emergency sampling and analysis of the contaminated drinking water;
- Inform employees of water sampling results; and
- Advise employees when it is safe to continue to utilise the drinking water.

- Failure of water and / or waste management infrastructure

Procedure to be followed in the event that water and / waste management infrastructure fails:

- Sound the emergency alarms;
- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required;
- Inform downstream / downslope users;

- Proceed to the nearest assembly point; and
- Should an emergency develop at a PCD, report the emergency to the DWS. A written report shall be provided to the DWS within 14 days (as per GN 704).

- Dusty conditions

Procedure to be followed in severely dusty conditions:

- Advise and maintain contact with management;
- Sound the emergency alarms;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required; and
- Management to advice employees on the safety of continuing with duties.

- Damage or any threat to property or persons

The mine may, in the case of damage or any threat to property or persons:

- Sound the emergency alarms;
- Advise and maintain contact with management;
- Identify injuries and / or a risk to life / property;
- Contact emergency services, if required;
- Leave the building quickly via the nearest exit point; and
- Proceed to the nearest assembly point.

iii ***Communication of Environmental Emergencies***

- **Internal Communication of Environmental Emergencies**

Each emergency incident will be reported immediately, clearly, objectively and has its own route of communication. The general communication systems to be implemented:

- Two-way radios that are situated at the workshop and all supervisor vehicles.
- Telephones, as well as, cell phones that are situated in designated areas or on persons.

- **External Communication of Environmental Emergencies**

Information regarding environmental emergencies at the Nakedi Solutions' Mine, should they occur, is disclosed to various external bodies, and includes:

- Relevant authorities (e.g. DMR, DWS, LEDET)
- I&AP's :
- Landowners and adjacent landowners.
- Registered I&AP's (if applicable).
- Stakeholders.

- **Communication of environmental emergencies with relevant authorities**

In the event of an environmental emergency, the appropriate procedures will be followed. The SHE manager will report to the mine management and identify whether or not the DMR (in the event of serious injury or fatality) or the DWS (in the event of serious spillages or pollution) are required to be notified.

The SHE manager will then conduct an in situ investigation to gather all the relevant detail and an enquiry will be held to compile an accident / incident report, which will be provided to the DMR/ DWS if required.

- **Communication of environmental emergencies with I&AP's**

As mentioned above, information regarding environmental emergency situations is made available to I&AP's should the environmental emergency have an impact on the said I&AP's. This information made available includes, but not limited to:

- The type of environmental emergency (e.g. serious spillages);
- The duration of the environmental emergency;
- Impacts related to the environmental emergency;
- Anticipated duration of the impacts;
- Remediation actions to be undertaken; and
- Anticipated remediation completion.

h) Specific information required by the Competent Authority

(Among others, confirm that the financial provision will be reviewed annually).

- No additional / specific information has been requested by the Competent Authority to date.
- It is noted that the Financial Provision will be reviewed annually until there is no need for any active rehabilitation on the site.

List of references

1. Blouberg Local Municipality. (2021). *Final Reviewed IDP/Budget 2021/2022 -2026.*
2. Affairs, D. o. (2014). *National Environmental Management Act, 1998 (Act 107 of 1998). Environmental Impact Assessment Regulations. Government Gazette 38282, Government Notice R 982 of 4 December 2014.* Pretoria: Government Printer.
3. Botha, H. (2021). *Traffic Impact Study for the proposed Nakedi Solutions (Pty) Ltd Mining Right application on farms Baden 90LR & portion of portion 0 of Bronkhorsfontein 42LR in Blouberg Local Municipality of Capricorn District in Limpopo province.* DZ Investments (PTY) LTD.
4. Molepo, M. (2021). *Ecological Impact Assessment for the for the proposed Mining Right on farms Bronkhorsfontein 42 LR and Baden 90 LR within Blouberg local municipality of the Capricorn District in Limpopo .*
5. Mucina, L., & Rutherford , M. C. (2006). *The Vegetation of South Africa, Lesotho and Swaziland. Pretoria: South Africa National Biodiversity Institute.*
6. Municipality, Blouberg Local. (2013). *Local Economic Development Strategy.*
7. Neluvhalani, M. (2019). *Arengo 297 (Pty) Ltd Application for a Mining Right at various farms but with special emphasis to Cornwall 313KQ portion 3 for various minerals but with special emphasis on Iron Ore covering 12100Ha in Thabazimbi Limpopo.* MNR Mining Corporation (Pty) Ltd.
8. Walton, N., van Nierop, M., & Rautenbach, C. (2009). CAPRICORN DISTRICT MUNICIPALITY AIR QUALITY.

2) UNDERTAKING

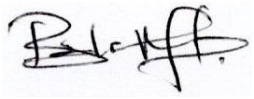
The EAP herewith confirms

a. the correctness of the information provided in the reports ☒

b. the inclusion of comments and inputs from stakeholders and I&APs; ☒

c. the inclusion of inputs and recommendations from the specialist reports where relevant; ☒and

d. that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. ☒



Signature of the environmental assessment practitioner:

MNB Holdings (Pty) Ltd on behalf of **Nakedi Solutions (Pty) Ltd**

Name of company:

14/06/2022

Date:

-END-