

**BASIC ASSESSMENT REPORT & ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT****MINING PERMIT AND ENVIRONMENTAL AUTHORIZATION APPLICATION FOR CHROME ORE, PLATINUM GROUP METALS, COPPER, NICKEL ORE, VANADIUM ORE AND IRON ORE WITHIN THE PORTION OF THE REMAINING EXTENT OF THE FARM BULTFONTEIN 204 JP, SITUATED UNDER THE MAGISTERIAL DISTRICT OF MOSES KOTANE, NORTH WEST PROVINCE.**

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**DMR REF: NW 30/5/1/3/2/ (10956) MP**



mineral resources  
& energy

Department:  
Minerals Resources and Energy  
REPUBLIC OF SOUTH AFRICA

## **BASIC ASSESSMENT REPORT**

**And**

## **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

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

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## DOCUMENT CONTROL

**Project Title:** Mining Permit Application on portion of the remaining extent of the farm Bultfontein 204 JT

### Mineral

**Site Location** Moses Kotane Magisterial District, Northwest Province.

**Compiled on behalf of** Jaments (Pty) Ltd

**Compiled By** Ms Khumbelo Makhado

**Reviewed By** Dr Kenneth Singo

**Submitted to** Department of Mineral Resources and Energy

**Date** 2021

## DISCLAIMER

The opinions expressed in this report have been based on the information sourced by Singo Consulting (Pty) Ltd through desktop studies and the local knowledge of the land occupiers/landowners as well as the relevant stakeholders. Opinions presented in this report apply to the site conditions and features as they existed at the time of Singo Consulting's investigations, and those reasonable and foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this report, about which Singo Consulting had no prior knowledge nor had the opportunity to evaluate.

## **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.



## **OBJECTIVE OF THE BASIC ASSESSMENT PROCESS**

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

- a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- b) identify the alternatives considered, including the activity, location, and technology alternatives;
- c) describe the need and desirability of the proposed alternatives,
- d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
  - e) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - f) the degree to which these impacts can be reversed; may cause irreplaceable loss of resources; and can be managed, avoided or mitigated;
- g) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to
  - identify and motivate a preferred site, activity and technology alternative;
  - identify suitable measures to manage, avoid or mitigate identified impacts; and identify residual risks that need to be managed and monitored.

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## **PART A: SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT**

### **1 Contact person and correspondence address**

a) Details of the Environmental Assessment Practitioner (EAP).

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b) Expertise of the EAP

Please refer to Annexure B for the EAP's qualifications and Curriculum Vitae.

#### **Qualifications of the EAP (with evidence)**

##### **Education**

- BSc (Hons) Mining & Environmental Geology
- MSc Mining and Environmental Geology

Singo Consulting (Pty) Ltd is a growing organization in the field of geological sciences, environmental sciences, and environmental management. This organization has provided sound practicable solutions to unavoidable environmental problems, particularly those triggered by human activities. This is achieved by tackling environmental problems using various fields of applied science, such as chemistry, hydrology, environmental geology, geochemistry, geophysics, and soil sciences. This leads to proper and sound environmental impact assessments and the production of enforceable environmental management plans. This organization has conducted over 26 successful Environmental Impact Assessments (EIAs) in various provinces of South Africa, basic assessment reports and environmental management plans (EMPs) which protect and promote the sustainable utilization of environment.

## 2 Location of the overall activity

<b>Farm name</b>	Portion of the remaining extent of the farm Bultfontein 204 JP
<b>Application area (ha)</b>	5 ha
<b>Magisterial district</b>	Moses Kotane
<b>Distance and direction from nearest town</b>	Approximately 39.42 km North-East of Swartruggens and about 55.73 km North-West of Rustenburg.
<b>21-digit Surveyor General code for each farm portion</b>	TOJP00000000020400000

### 2.1 Locality map (show nearest town, scale not smaller than 1: 250,000)

The project area is located next to Bapong village. It is situated approximately 39.42 km North-East of Swartruggens and about 55.73 km North-West of Rustenburg. The project can be accessed with the regional road R556.

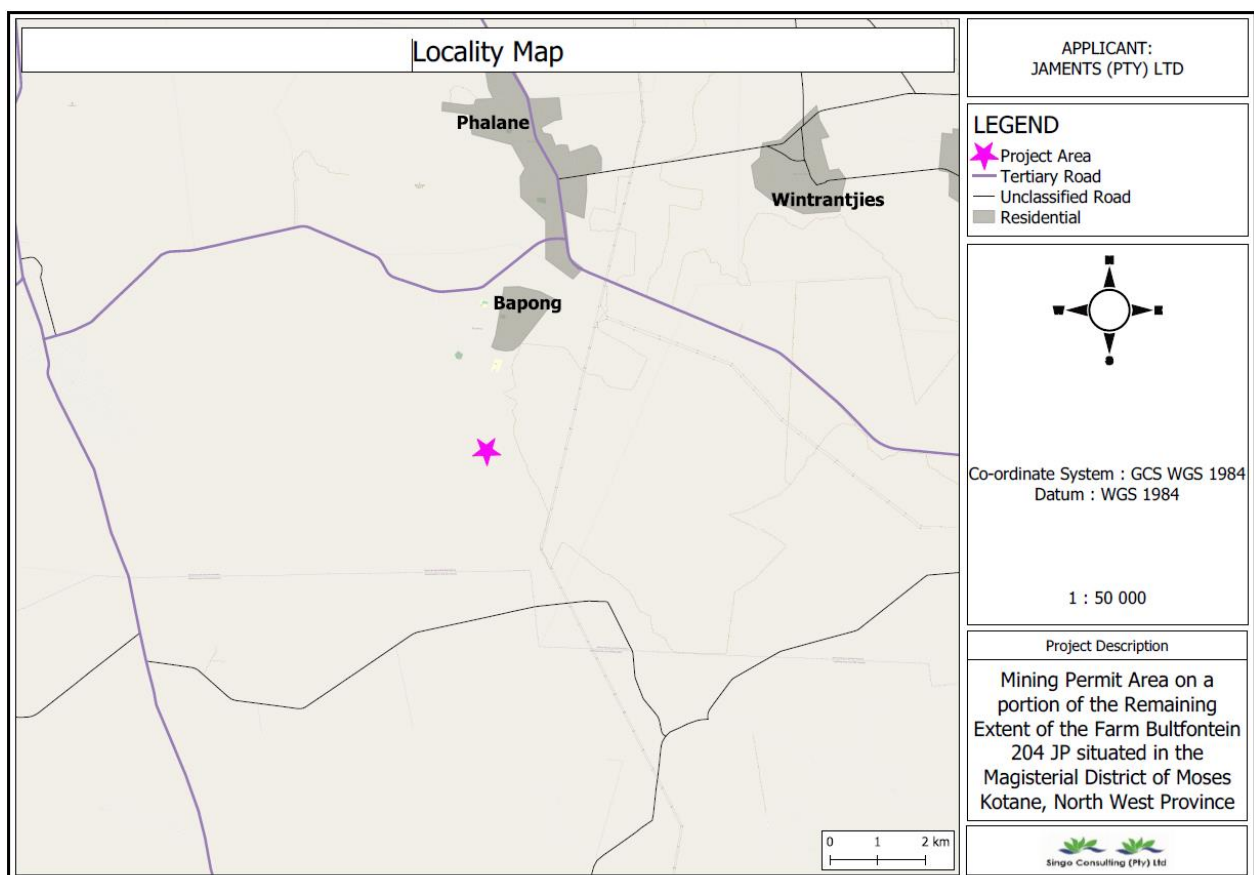


Figure 1: Locality map showing the project area and the nearest villages.

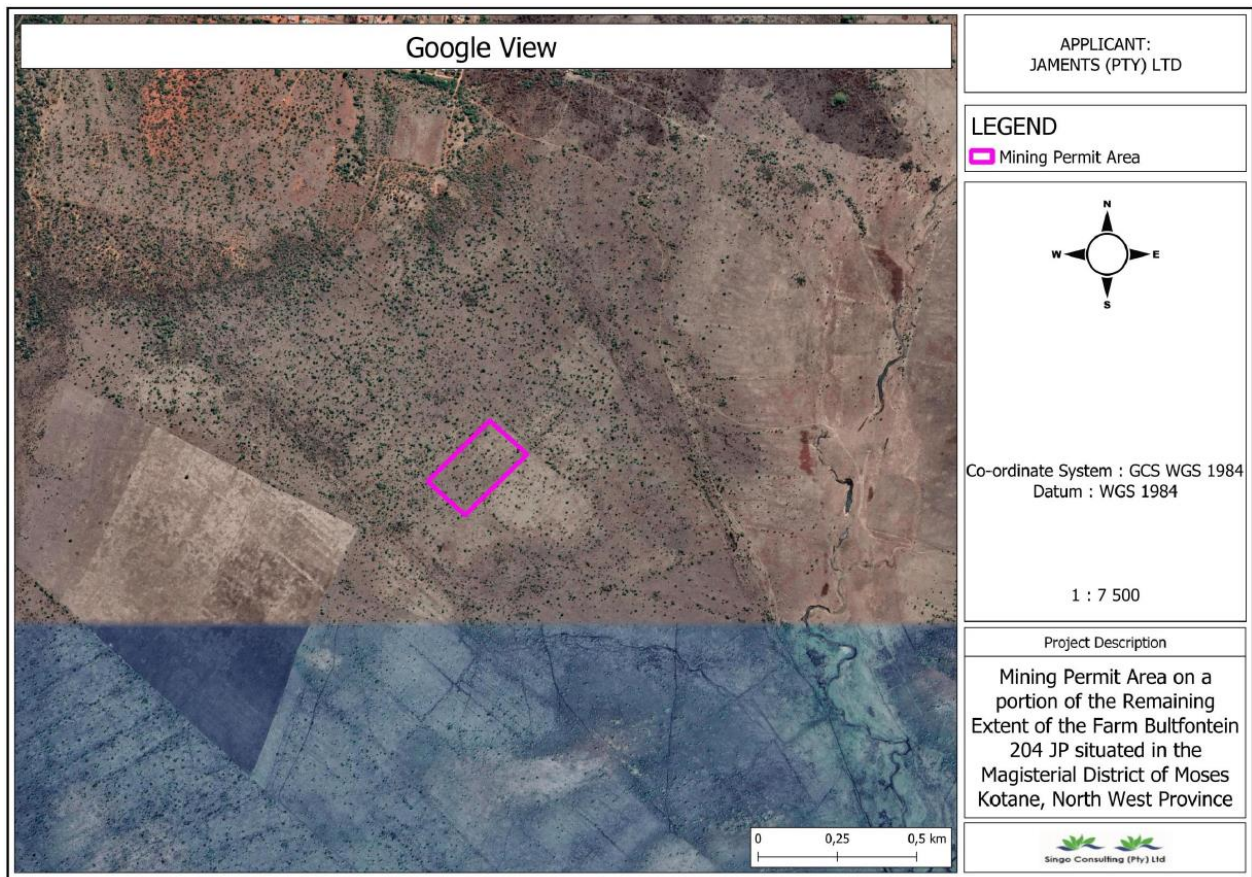


Figure 2: Google earth view map of the mining permit.

## 2.2 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 (ha)) of all aforesaid main and listed activities, and infrastructure to be placed on site.

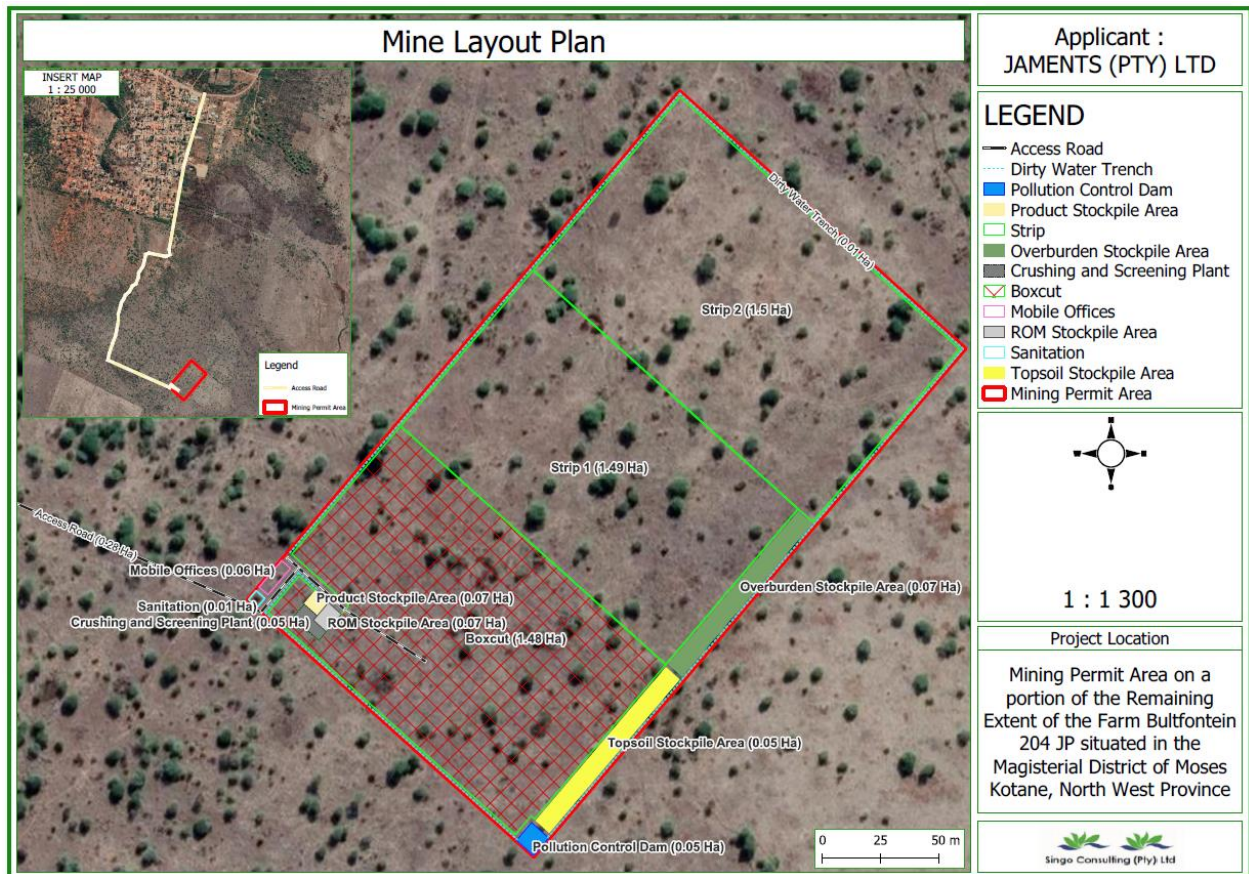
The method that will be employed is a very basic form of open cast mining, and a 5-ha area will be demarcated for mining activities. Blasting and subsequent mining of the orebody utilizing a truck and shovel operation will be conducted (Figure 2). The mined ore will be crushed and screened utilizing a mobile crushing and screening plant that will be established within the boundaries of the mining area. A front-end loader will be utilized to load the material into haulage trucks. The mine will operate for a two (2) year permit period with an option to renew for three (3) periods of which may not exceed one year. The PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the boundaries of the mining site.

The project infrastructure and activities will include the following:

- Site clearance.
- Removal of topsoil and overburden and stockpiling.



- Site establishment, including the establishment of an access route, mobilization of equipment and preparation of area for mining.
- Excavation of an open pit.
- Blasting.
- Loading zone.
- Loading and dust control.
- Crushing and screening.
- Hauling and transporting of ore.
- Ablution facilities and waste storage area.
- Rehabilitation of site and Monitoring.



**Figure 3: Mine layout**

The open cast mining method is the obvious choice for horizontally orientated mineralization exposed or exists close to the surface. The opencast is opening the orebody from the surface by separately removing the ore and associated waste rocks. It is the most economic option for a deposit up to that depth where the economic ratio of ore and waste can sustain. Jaments (Pty) Ltd chose this method because of its advantages which are:

- Full visualization of exposed orebody and negligible ore loss,
- Greater concentration of operations, better grade control and blending,
- No need of artificial light in the day shift with natural ventilation round the clock,
- Greater safety, minimum mining hazards like gasification, roof and wall support,
- Easy draining/pumping of subsurface water,
- No restriction of working with heavy and bulky machineries,
- Lower capital and operating costs,
- Minimum mine development work and higher OMS leading to early production and quick return of capital invested (payback period).

**Table 1: Listed and specified activities**

NAME OF ACTIVITY E.g. for prospecting: drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office and access route; and for mining: excavations, blasting, stockpiles, discard dumps/ dams, loading, hauling, transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines and conveyors.	Aerial extent of the activity Ha or m <sup>2</sup>	Listed activity Mark with X where applicable	Applicable listing notice  (GNR 324, GNR 325 OR GNR 327)
Open cast mining and crushing to produce PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore specs required by clients	5Ha	X	GNR 327 Listing notice 1 activity 21: Any activity, including the operation thereof, which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (No. 28 of 2002), including related infrastructure, structures and earthworks directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA, 2002 (28 of 2002)
A closure certificate in terms of section 43 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)	5Ha	X	GNR 327 Listing notice 1 activity 22: Decommissioning of any activity requiring a closure certificate in terms of section 43 of the MPRDA, 2002 (No 28 of 2002)
Vegetation Clearance	5 Ha	X	GNR 327 Listing Notice 1 activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in

			accordance with a maintenance management plan.
Overburden stockpile	0.07Ha	X	Not listed
Topsoil stockpile	0.05Ha	X	Not listed
ROM stockpile area	0.07Ha	X	Not listed
Mobile offices	0.06Ha	X	Not listed
Toilets and sanitation	0.01Ha	X	Not listed
Pollution Control Dam (PCD) construction	0.05Ha	X	Not listed
Box cut construction	1.48Ha	X	Not listed
Ripping, Drill & Blasting	2.99Ha	X	Not listed
PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore extraction	4.47Ha	X	Not listed
Rehabilitation	5 Ha	X	GNR 327 Listing notice 1 activity 22: Decommissioning of any activity requiring a closure certificate in terms of section 43 of the MPRDA, 2002 (No 28 of 2002)

### 2.3 Description of the activities to be undertaken

Describe methodology/technology to be employed, including type of commodity to be prospected/mined, a linear activity and a description of the route of the activity.

The mining method proposed involves open cast extraction of ore minerals from a pit.



**Figure 4: Typical example of opencast mining.**

This project will be carried out in terms of National Environmental Management Act,



1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2014 (as amended) read together with regulation 40-43 of the Act. The triggered activities as reflected on GNR 324, GNR 325 OR GNR 327 (as amended) Activity No. will be; LN 1 Activity 21,22 & 27:

- ❖ LN 1 Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
- ❖ Activity 21: The project requires a mining permit in terms of the MPRDA.
- ❖ Activity 22: Upon closure of the site a closure permit in terms of the MPRDA will be required.

LN 1 Activity 27 is about clearing of vegetation and this application seek to be authorized for this activity. Deforestation process is required before commencement of any mining activity if the area is vegetated, this process allows the mining company to gain access to the mining area and locating other required infrastructures. Therefore, land clearance will be the first stage as part of development.



**Figure 5: Typical example of land clearing**

After completing the land clearing process, the mine area must be fenced and begin

with stripping and removal of the overburden.

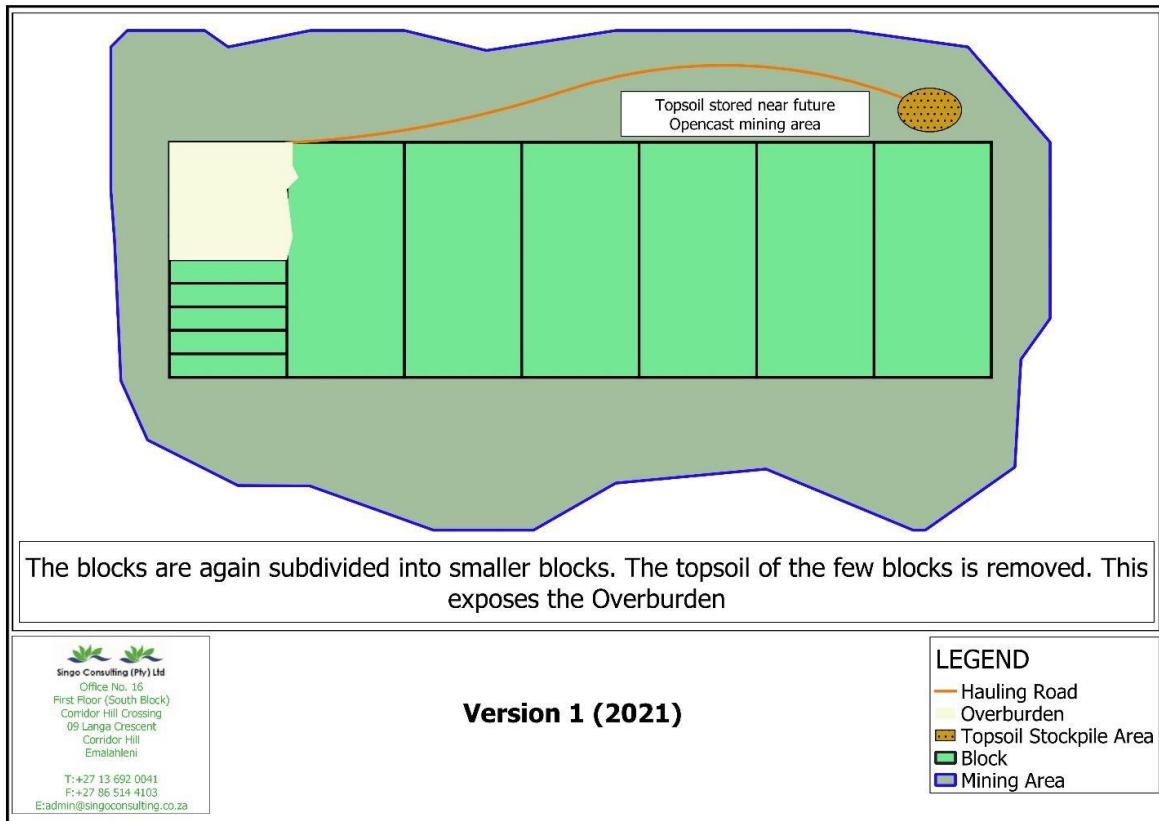


Figure 6: Top6 soil removal.

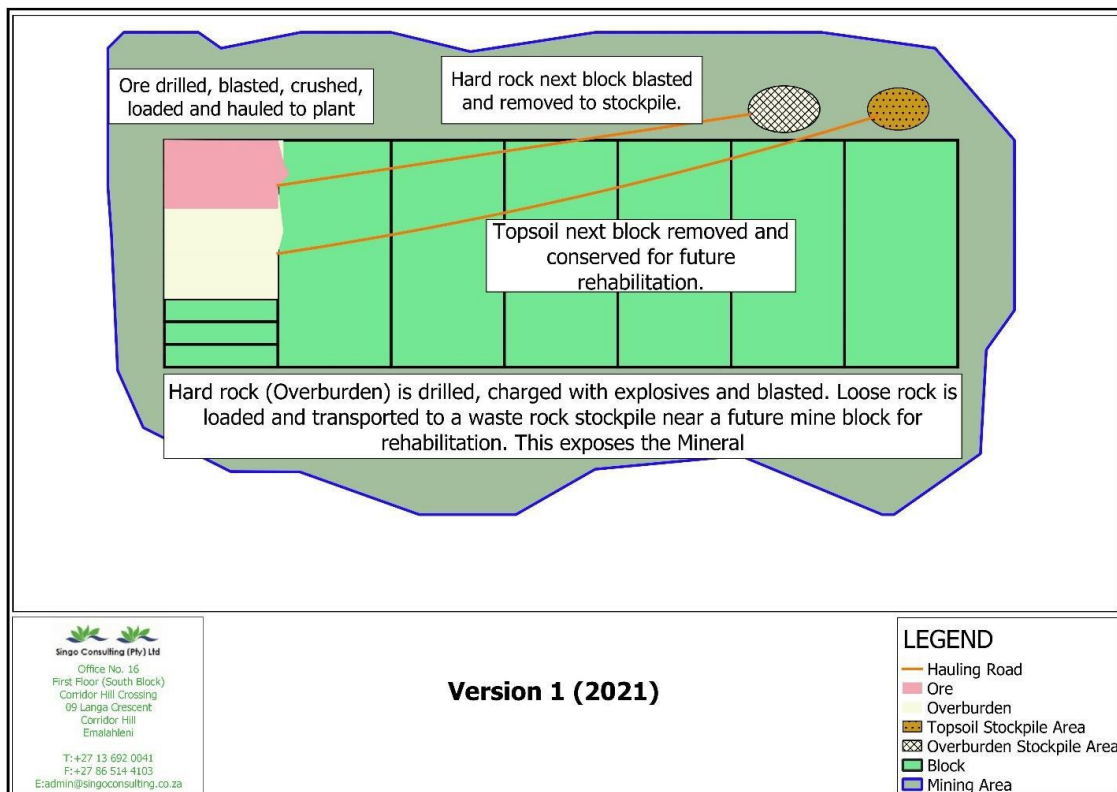


Figure 7: Overburden removal.





Figure 8: Typical example of removal of the overburden.

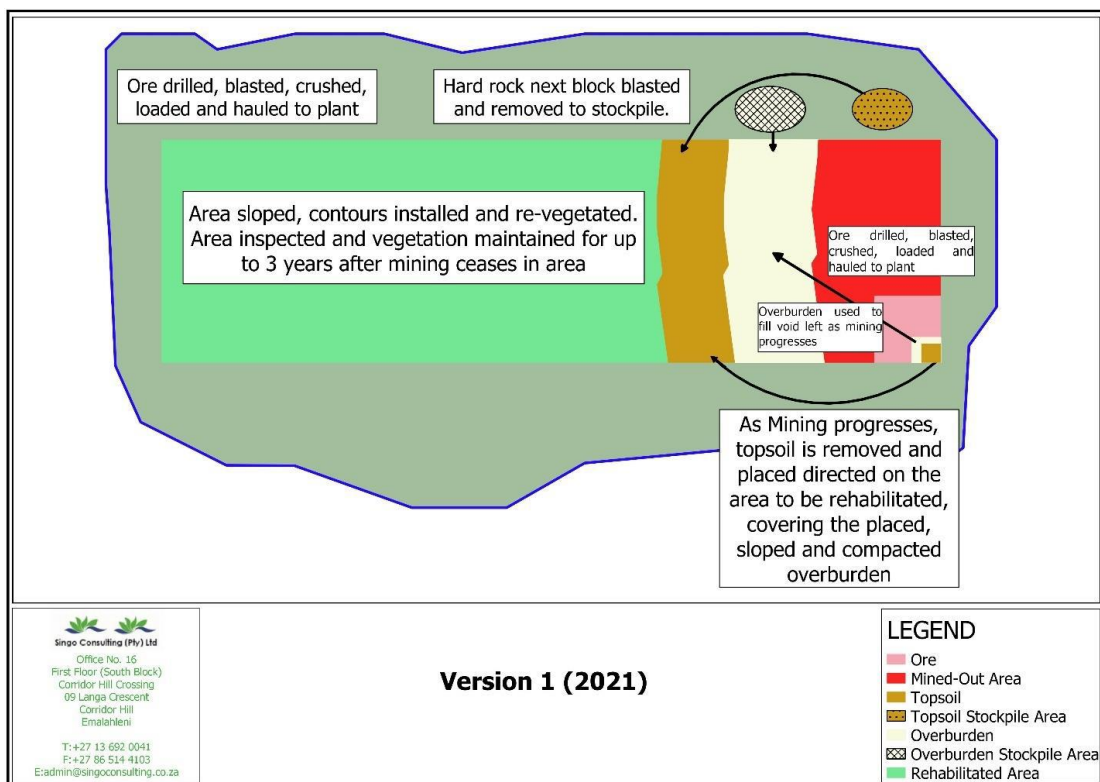


Figure 9: Backfilling and rehabilitation stage.

**Table 2: Phases and activities to be undertaken.**

Phase	Activity no	Activity
<b>Construction</b>	1	Site clearing: Removal of topsoil and vegetation
	2	Construction of any surface infrastructure, e.g. Haul roads, pipes, storm water diversion berms (incl. transportation of materials and stockpiling)
	3	Free digging and development of initial box cut for mining
	4	Temporary storage of hazardous products (fuel, explosives) and waste
<b>Operation</b>	5	Removal of overburden and backfilling when possible (incl. drilling/free digging of hard overburden and stockpiling)
	6	Use and maintenance of haul roads.
	7	Extraction of PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore (mining process) and run of mine (RoM) PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore stockpile
	8	Water use and storage on site
	9	Storage, handling and treatment of hazardous products (fuel, explosives, oil) and waste activities (waste, discard)
	10	Concurrent replacement of overburden, topsoil and re-vegetation
<b>Decommissioning</b>	11	Removal of all infrastructure (incl. transportation off site)
	12	Rehabilitation (spreading of soil, re-vegetation and profiling)
	13	Installation of post-closure water infrastructure
	14	Environmental monitoring of decommissioning activities
	15	Storage, handling and treatment of hazardous products (fuel, explosives, oil) and waste activities (waste discard)
<b>Post-closure</b>	16	Post-closure monitoring and rehabilitation

### 2.3.1 Site establishment/construction phase

During site establishment, the applicant must demarcate the site boundaries and clear the topsoil and overburden from the extension area to open it for free digging. Upon stripping, the topsoil and overburden will be stockpiled along the boundaries of the pit for use during the rehabilitation phase. Topsoil stripping will be restricted to the areas to be mined. The complete A-horizon (topsoil – the top 100-200 mm of soil, which is generally darker in colour due to high organic matter content) will be removed. If it is unclear where the topsoil layer ends, the top 300 mm of soil must be stripped.

The topsoil will be stockpiled in the form of a berm alongside the boundary of the mine pit where it will not be driven over, contaminated, flooded, or moved during the operational phase. The topsoil berm will measure a maximum of 1.5 m high and indigenous grass species must be planted on it, if vegetation does not naturally establish within 6 months of stockpiling, to prevent soil erosion and discourage weed growth. The roots of the grass will improve soil viability for rehabilitation purposes. The stripped overburden will be stockpiled on a designated area after the topsoil has been removed.

Overburden is waste rock consisting of consolidated and unconsolidated material that must be removed to expose the underlying ore body. It is desirable to remove as little overburden as possible in order to access the ore of interest, but a larger volume of waste rock is excavated when the mineral deposit is deep. The removal techniques that

will be employed are cyclical with interruption in the extraction (drilling, blasting and loading) and removal (haulage) phases. This is particularly true for hard rock overburden which must be drilled and blasted first. An exception to this cyclical effect are, dredges used in hydraulic surface mining and some types of loose material mining with bucket wheel excavators. The fraction of waste rock to ore excavated is defined as the stripping ratio. Stripping ratios of 2:1 up to 4:1 is not uncommon in large mining operations. Ratios above 6:1 tend to be less economically viable, depending on the commodity. Once removed, overburden can be used for road and tailings construction or may have non-mining commercial value as fill dirt.

Surface mining is a mine in which the ore lies near the surface and can be extracted by removing the covering layers of rock and soil. Almost all surface mining operations are exposed to the elements and require no roof support. Open cast mining method employ a conventional mining cycle of operations to extract minerals: rock breakage is usually accomplished by drilling and blasting for consolidated materials and by ripping or direct removal by excavators for unconsolidated soil and/or decomposed rock, followed by materials handling and transportation. Open cast mining method was considered based on the geological data, extrapolation of resource from nearby mines, life span of a permit and the closure advantage of open cast mining.

During the development and exploitation stages of mining when natural materials are extracted from the earth, remarkably similar unit operations are normally employed. The unit operations of mining are the basic steps used to produce mineral from the deposit, and the auxiliary operations that are used to support them. The steps contributing directly to mineral extraction are production operations, which constitute the production cycle of operations. The ancillary steps that support the production cycle are termed auxiliary operations. The production cycle employs unit operations that are normally grouped into rock breakage and materials handling. This cyclic operation will be employed to recover PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore resources.

Breakage generally consists of drilling and blasting, and materials handling encompasses loading or excavation and haulage (horizontal transport) and sometimes hoisting (vertical or inclined transport).

Thus, the basic production cycle consists of these unit operations:

**Production cycle=Drill+ Blast + Load+ Haul**

Although production operations tend to be separate and cyclic in nature, the trend in modern mining and tunnelling is to eliminate or combine functions and to increase continuity of extraction. For example, in PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore and other soft rock mines, continuous miners break and load the mineral to eliminate drilling and blasting. The cycle of operations in surface and underground mining differs primarily by the scale of the equipment. Specialized machines have evolved to meet the unique needs of the two regimes.



species is an important aspect after topsoil replacement and seeding (if applicable) has been done in an area. Site management will implement an alien invasive plant management plan during the 12-month aftercare period to address germination of problem plants in the area.

The decommissioning activities will include:

- Sloping and landscaping during rehabilitation
- Replacing of topsoil
- Implementation of an alien invader plant management plan

## 2.4 Policy and legislative context

This Mining Permit application requires authorization in terms of the following interlinked pieces of legislation:

- ❖ The Mineral and Petroleum Resources Development Act, 2002 (MPRDA, Act 28 of 2002), as amended.
- ❖ The National Environmental Management Act, 1998 (NEMA, Act 107 of 1998), as amended.

These pieces of core legislation stipulate the required studies, reports, and legal processes to be conducted and the results thereof are to be submitted to the relevant authorities for approval prior to commencement. In addition to the above, there are various pieces of legislation which govern certain aspects of the mining operations, and these are summarized in Table 3, together with the main legislative requirements mentioned above.

**Table 3: Policy and Legislative Context.**

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
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.		E.g. In terms of the National Water Act (NWA) a Water Use License has/has not been applied for.
Minerals and Petroleum Development Resources Act, Act 28 of 2002 (MPRDA) and the MPRDA Amendment Act, Act 49 of 2008	Application for a mining permit DMRE reference: NW30/5/1/3/2/1095 6MP	GNR 327 (Of 2017), Activity 21: Any activity including the operation therefore, which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (No. 28 of 2002). The application was accepted on the 14 <sup>th</sup> of October 2021.
Constitution of South Africa, specifically everyone has the right to: an environment that is not harmful to their health or wellbeing	Republic of South Africa	The mining activities will only proceed after effective consultation.



Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the legislation and policy context
have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development		
Environmental Impact Assessment (EIA) regulations	Application for environmental authorization: DMRE Reference: NW30/5/1/1/3/10956 EM	GN R. 324/GN R. 325/GN R. 327 Activities 27, 21, and 22
National Environmental Management Act, Act 107 of 1998 (as amended) (NEMA)	Application for environmental authorization: DMRE Reference: NW 30/5/1/1/3/10956 EM	GN R. 324/GN R. 325/GN R. 327 Activities 27, 21, and 22 The application was acknowledged on the 20 <sup>th</sup> of September 2021
National Water Act, 1998 (Act 36 of 1998). Best Practice Guidelines: Series A, G, & H	(S 21) Water use & mine water management	Best practice guidelines will be followed for water management, water characterization, water resource protection, water treatment, and the development of the mine water management model
National Environmental Management: Waste Act, Act 59 of 2008 (NEMWA)NEM: WA	Management measures Environmental awareness plan	All type of waste will be managed as prescribed by the regulation (NEMWA)
National Heritage Resources Act, 25 of 1999 (NHRA)	Management measures	No mining activities will take place within 500 m of any identified heritage resource, such as a grave. No graves have been identified on the site in question.
Municipality By-Laws: Waste Management by-law Act 59 of 2008, Air Quality Management By-law Act 39 of 2004, Noise control by-law, Spatial Planning and Land Use Management act no 16 of 2013 (SPLUMA).	Environmental Management measures awareness plan	Best practice guidelines will be followed for any by-law's management and the development of the mine environmental and other legislative management.

## 2.5 Need and desirability of the proposed activities

Describe methodology/technology to be employed, including the type of commodity to the prospected/mined and for a linear activity, a description of the route of the activity.

The mining sector in South Africa has traditionally occupied a principal role in the generation of economic output. It provides employment and reduces poverty. The mining companies have an obligation to improve and develop the state of the communities in which they operate through infrastructure, education, and skills development. The mining activities bring different kinds of business, which has significant economic benefits for communities. And in most cases, the jobs created by the mines

pay more than the average salary. The mining industry makes a big contribution to South Africa's export market. It generates significant gains from the foreign exchange rate differences. Mining contributions to the total government revenue are directed to the national and sub-national levels. The profits of mining companies and taxes generated by companies, in addition, contribute to the Gross Domestic Product (GDP) of the country.

The complex contains the world's largest reserves of platinum-group metals (PGMs) or platinum group elements (PGEs) such as platinum, palladium, osmium, iridium, rhodium, and ruthenium along with vast quantities of iron, tin, chromium, titanium, and vanadium. These are used in, but not limited to, jewellery, automobiles, and electronics. Gabbro or norite is also quarried from parts of the complex and rendered into dimension stone. There have been more than 20 mining operations. There have been studies of potential uranium deposits. The complex is well known for its chromitite reef deposits, particularly the Merensky reef and the UG-2 reef. It represents about 75 percent of the world's platinum and about 50 percent of the world's palladium resources. In this respect, the Bushveld complex is unique and one of the most economically significant mineral deposit complexes in the world.

### **2.5.1 Advantages**

- ❖ The Northwest province has abundant chromitite reefs, PGMS

### **2.5.2 Disadvantages**

## **2.6 Motivation for the overall preferred site, activities and technology alternative**

The proposed site earmarked for the winning of the PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore will include the pit. The proposed site was identified as the preferred alternative due to the following reasons:

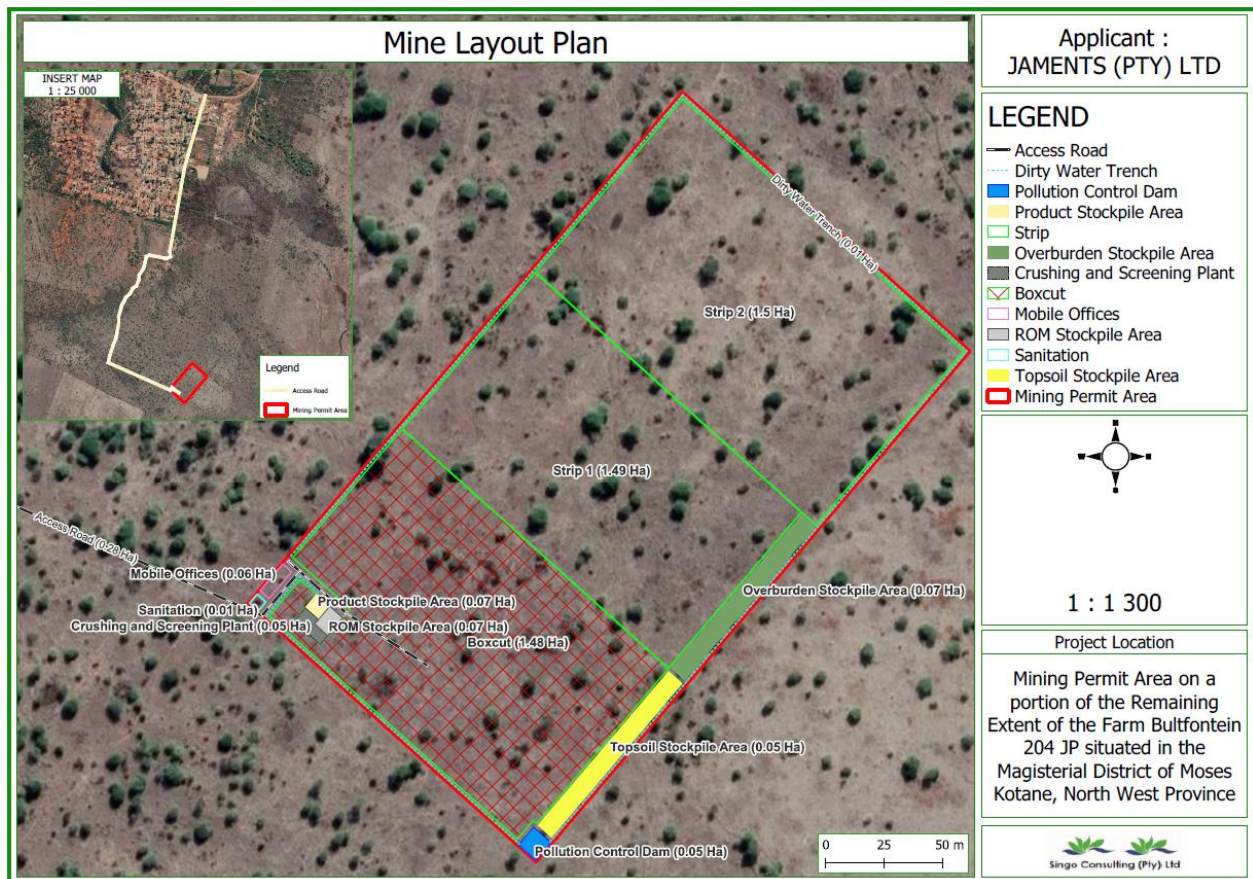
- The site offers the sought-after resource.
- The mining impacts can be contained to one area.
- Very little natural vegetation needs to be disturbed to establish the mining area as most of the area is bare land without no residents or agricultural activities.
- The mining area can be reached by an existing access road from the provincial road north of the property (R565). No new road infrastructure needs to be constructed.
- The open cast mining of the aforementioned minerals has been identified as the most effective method to produce the desired minerals. Due to the remote location of the pit, the potential impacts on the surrounding environment, associated with open cast mining, is deemed to be of low significance.
- The general waste produced on-site will be contained in sealed refuse bins to be

transported to the local municipal landfill site.

- As equipment maintenance and servicing will be done at an off-site workshop, the amount of hazardous waste to be produced at the site will be minimal and mainly as a result of accidental oil or diesel spillages.
- Contaminated soil will be removed to the depth of the spillage and contained in sealed bins until removed from site by a hazardous waste-handling contractor to be disposed of at a registered hazardous waste handling site.

## 2.7 Full description of process followed to reach proposed preferred alternatives within the site

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 (I&APs), and the consideration of alternatives to the initially proposed site layout.



## 2.8 Details of the development footprint alternatives considered

With reference to the site plan provided as APPENDIX 3 and the location of individual site activities, provide details of the alternatives considered with respect to:



- (a) the property on which or location where it is proposed to undertake the activity
- (b) the type of activity to be undertaken
- (c) the design or layout of the activity
- (d) the technology to be used in the activity
- (e) the operational aspects of the activity
- (f) the option of not implementing the activity

Jaments (Pty) Ltd identified the need for PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore in the area due to an increase in PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore usage. In this light, the applicant identified the proposed areas as the preferred and only viable site alternative. From extensive work conducted previously in this area, it is known that this area contains the resource being sought.

Various project alternatives were considered during the planning phase of the project. These included the following:

### **2.8.1 Open cast mining (preferred alternative) vs. underground mining**

- The open cast mining method is used when deposits of commercially useful minerals or rock are found near the surface, where the overburden is relatively thin or the material is structurally unsuitable for tunnelling.
- Underground mining is used where the mineral occurs deep below the surface and the overburden is thick.
- Open cast mining of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore has been identified as the most cost-effective method to produce the desired PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore as it is found near the surface, with only a narrow layer of overburden that needs to be removed.
- The geology of the area and depth of PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore to be mined is structurally unsuitable for tunnelling.
- The open cast mining method will not produce any residual waste to be disposed of. Due to the location of the proposed PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pits, the potential impacts on the surrounding environment is expected to be insignificant. It is proposed that all mining-related infrastructure be contained in the boundary of the mining area.

### **2.8.2 Temporary infrastructure (preferred alternative) vs. permanent infrastructure**

- Temporary infrastructure use will entail the use of track-based or easily removable infrastructure. This includes a mobile in-pit crusher plant, temporary weigh bridge and chemical toilet, with off-site vehicle and equipment servicing (at the applicant's existing workshop). The off-site office will be used for project administration purposes.
- Positive aspects: The infrastructure can be moved around in the mining area boundaries as mining progresses, decreasing the distance material has to be transported from the crusher plant to the stockpile area. In addition, the crusher plant and other equipment can move out of the mining area (and onto the existing road) during a blast to prevent potential fly rock damage. During the decommissioning phase, infrastructure will be removed from the mining area, making site rehabilitation easy and effective.
- Permanent infrastructure will entail the construction of an office building with ablution facilities, installation of a septic tank to be connected to the ablution facilities, installation of a permanent weigh bridge and permanent crusher plant.
- The use of permanent infrastructure will increase the impact of the proposed project on the environment as it will entail the establishment of more structures, necessitate the use of concrete products on site to establish these infrastructure, lengthen the period required for rehabilitation as well as increase the rehabilitation cost as the permanent infrastructure will either have to be decommissioned or be maintained after the closure of the site.
- The construction of permanent infrastructure on site will increase the visual impact of the proposed project on the surrounding environment and additional mitigation measures will have to be implemented to address the impact.
- In the light of the above, the use of temporary infrastructure is deemed to be the most viable preferred alternative.

### **2.8.3 Access onto provincial road (preferred alternative) vs. national road**

- Provincial roads (R 565): The existing access road of the farm connects to the provincial road passing the property to the northern side. It is proposed that this road be used by trucks transporting material from the pit to the clients as it will prevent trucks having to turn from a farm entrance onto the local road, thereby minimising the potential impact on traffic.



**Figure 12: Existing access road from R 565.**

- National road (N4): The turning of trucks transporting material from the mining area to clients onto the N4 is not considered here, since the is about 11 km away. To minimise the impact the activity may have on traffic, it is proposed that this option is not implemented and the alternative provincial road (as mentioned above) be used as access road to and from the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit.

#### **2.8.4 No-go alternative**

The no-go alternative entails no change to the status quo and should therefore be considered. The PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore to be mined at the site will be used for energy and power industries. If the no-go alternative is implemented, the applicant will not be able to expand the mine to utilise the mineral present in the area. This could have major impacts on aspects such as transporting of material to power stations from far off mining areas, cost-effectiveness of material, impact on roads and road users due to long distance hauling of PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore and loss of income to

the Rustenburg business area.

The no-go alternative was not considered the preferred alternative, as:

- The applicant will not be able to supply in the demand of industrial metals.
- The application, if approved, would allow the applicant to utilise the available PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore , as well as provide employment opportunities to local employees. Should the no-go alternative be followed, these opportunities will be lost to the applicant, potential employees, and clients.
- The applicant will not be able to diversify the income of the property.

## **2.9 Details of the public participation process followed**

Describe the process undertaken to consult I&APs, including public meetings and one-on-one consultation. 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 stakeholders and I&APs were informed of the project by means of I&AP comment/notification letters sent directly to the contact persons and newspaper on 22 October 2021 (see attached response report with public participation procedure details). A 30-day commenting period was included as well. The following Government Departments /Local Municipality officials and others were engaged via emails and registered letters:

- Moses Kotane Magisterial District
- Moses Local Municipality
- Department of Water Affairs
- Department of Agriculture, Forestry and Fisheries
- Department of Environmental Affairs
- North West Tourism and Parks Agency
- Department of Land Restitution Commission
- Department of Rural Development and Land Reform

On-site notices were placed at the turn off from the roads onto the property close to

the nearby community (Bapong) and around the project area to advertise the project. The project was also advertised in the local newspaper, *Rustenburg Herald*.

Stakeholders and I&APs were notified of the availability of the Draft Basic Assessment Report for their perusal. A 30-day commenting period will be allowed for the perusal of the document upon which any comments received will be incorporated into the Final Basic Assessment Report to be submitted to DMRE for approval.

### 2.9.1 Project advert published on *Rustenburg Herald* released 22 October 2021

PAGE 18 RUSTENBURG HERALD 22 OCTOBER 2021

## New Miss SA congratulated

RUSTENBURG HERALD - RUSTENBURG - Sport, Arts and Culture Minister Nathi Mthethwa has congratulated the newly crowned Miss SA Lalela Mswane.

Mswane (24), from KwaZulu-Natal who walked away with the Miss SA 2021 title on Saturday (19 October) at the Grand Arena, Grand West in Cape Town. She was crowned at the 63rd edition of the Miss South Africa pageant by former Miss South Africa, Shudufhadzo Mazida. The two runners-up were Moratse Masime from Gauteng and Zimi Mabuzi from Eastern Cape. Mswane, who is a model and dancer, holds a Bachelor of Law qualification from the University of Pretoria. Mthethwa wished Mswane all the best in her reign as Miss South Africa. "We trust that she will represent the country very well. She certainly embodies the leadership qualities that are key to making an impact in the world as an ambassador of this country," Mthethwa said.



Miss SA Lalela Mswane (Photo: World Wide Web).

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### Fundraising event for Lighthouse Children's Home

Join Lighthouse Children's Home for a lovely morning at their "Mommy & Me High Tea" on Saturday 23 October at 11:00 at Hedgehog's Nest. Tickets at R200pp. Bookings: Elsa at 083 493 5911. Come and enjoy a lovely morning and support Lighthouse Children's Home.



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### Keep valuables out of sight

RUSTENBURG HERALD - RUSTENBURG - The police in Rustenburg are warning shoppers at shopping complexes and shopping malls to be extra vigilant and refrain from putting their valuables in plain sight when parking their cars to do their shopping.

This warning comes after several cases of theft out of vehicles have been reported recently in Rustenburg. Sergeant Orlene Mokgadi, police spokesperson in the Rustenburg Cluster said the rate at which these crimes occur is increasing especially as we are heading towards the holiday season. He said that shoppers should ensure that their valuables are safely locked away where criminals will not be tempted to steal them. Mokgadi also warned motorists to ensure that their vehicles are parked in a safe place at their places of residence and that when locking their vehicles, they must ensure manually that the vehicle is locked by testing it. Those who have fallen victims to such crimes are encouraged to open cases with the police to ensure that the criminals are brought to book.

### NOTICE OF A JOINT PUBLIC PARTICIPATION FOR MINING PERMIT AND ENVIRONMENTAL AUTHORIZATION APPLICATION

Application for Mining Permit: Jambets (Pty) Ltd has lodged an application for Mining Permit with (DMRE Ref: NW 3015/13/2) (19956 MP) for the purpose of extracting chrome ore, platinum group metals, copper, nickel ore, vanadium ore and iron ore on portion of the remaining extent of the Farm Bufffontein 204 JP, situated in Moses Kotane Local Municipality, under Bopape District Municipality within the Magistrate's District of Bots, North-West Province.

Notice is hereby given in terms of the Mineral and Petroleum Resource Development Act (MPRDA) (Act 28 of 2002) and EIA regulations 2014, published under Government Notice No. 1812 in Gazette No. 38222 of 8 December 2014, amended on 7 April 2017, that Jambets (Pty) Ltd has applied for Mining Permit Application for the above-mentioned minerals.

### NW Health MEC elated over one million Covid jabs reached

RUSTENBURG HERALD - RUSTENBURG - The North West Health MEC, Madoda Sambatha is elated by the progress made by communities and healthcare workers to ensure that the province reaches the significant milestone of administering over one million vaccines.

The province has finally reached the milestone of one million vaccinated people at the end of last week. "Our efforts to persuade our communities to register to vaccinate has finally started to bear fruit as we see our daily numbers of vaccines administered tick up. We are further impressed by the support we receive from various stakeholders who are drumming up support to ensure that access to vaccine is hugely improved" Sambatha said.

The Department of Health in the province has kicked into gear various strategies to promote access to communities by introducing innovative ways like setting up stalls at malls, churches, shopping centers, car washes and other frequented places to ensure that access to registration and vaccination is highly enhanced. "Bridging one million marks of administered jabs in the province is no small feat, it is a demonstration of concerted efforts and hard work to ensure that we convince our people to take this life saving vaccine. We supposed to celebrate this milestone and continue to use it to pursue more of people who seem hesitant to get vaccinated so that we can reach our provincial target of 2.7 million before the end of this year to secure community immunity" added Sambatha. The North West province has administered 1 023 456 vaccines to date. With the Vooma campaign in full swing the province hopes to net more people for vaccination.

### INVITATION TO COMMENT

Registration as Interested & Affected Party: As part of the EIA process, more especially the Public Participation Process (PPP) for this proposed mining permit project, Interested and Affected Parties (I&APs) are invited to register and kindly submit any comments or concerns to reach Ms Khumbelo Makhado by no later than **Friday, the 19th of November 2021**, on the contact details provided below. The public is also invited to review and comment on the Draft Basic Assessment Report (DBAR) and Environmental Management Programme report (EMPR). The Draft BAR & EMPR will be available for review for 30 days calendar period from **Saturday, the 20th of November 2021 to Friday, the 30th of January 2022** as per regulation 54 (2), section 4.6. The Draft BAR & EMPR will be available at the Mogwase Public Library, Island No. 933, Railway Road, Unit 3, Mogwase, 03141 and a soft copy upon request from Singo Consulting (Pty) Ltd using the detailed I&APs contact details below, via email, Dropbox link, Google drive, We Transfer, etc.

ENVIRONMENTAL ASSESSMENT PRACTITIONER AND APPLICANT'S DETAILS	CONSULTANT'S DETAILS	APPLICANT'S DETAILS
<p><b>Singo Consulting (Pty) Ltd</b> Physical Address: Office No. 16, Corridor Hill Crossing 09 Lange Crescent, Corridor Hill eMalaheni, 1035. Contact person: Ms Khumbelo Makhado Tel No.: +27 13 892 0941 Fax No.: +27 96 514 4103 Cell No.: +27 71 321 2975 Email: khumbelo@singoconsulting.co.za</p>	<p><b>JAMBETS</b> Physical Address: 15 Oeta Street Model Park, eMalaheni Postal address: P.Bag X7214 Witbank 1039 Tel No.: 076 246 6377 Fax No.: 086 565 4360 Email: s.mabane@jambets.co.za</p>	<p><b>JAMBETS</b> Physical Address: 15 Oeta Street Model Park, eMalaheni Postal address: P.Bag X7214 Witbank 1039 Tel No.: 076 246 6377 Fax No.: 086 565 4360 Email: s.mabane@jambets.co.za</p>

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Figure 13: Proof of advert ( Rustenburg Herald).






## 2.10 Summary of issues raised by I&APs



Compile the table summarising comments and issues raised, and reaction to those responses.

<b>I&amp;APs</b> List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.	<b>Date comments received</b>	<b>Issues raised</b>	<b>EAPs response to issues as mandated by the applicant</b>	<b>Section and paragraph reference</b> In this report where issues and/or responses were incorporated
<b>Affected parties</b>				
Landowner/s				
Republic of Bophuthatswana  Department of Rural development and Land Restitution  Mr Daniel Masina  Portion of the remaining extent of the farm Bultfontein 204 JP	<b>x</b>	No issue raised	Consultation email together with a BID, Windeed results and Landowner notification letter were sent	
<b>Adjacent land occupiers</b>				
<b>Local Municipal Officials</b>				

<b>I&amp;APs</b> List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.	<b>Date comments received</b>	<b>Issues raised</b>	<b>EAPs response to issues as mandated by the applicant</b>	<b>Section and paragraph reference</b> In this report where issues and/or responses were incorporated	
 <p><b>Moses Kotane Local Municipality</b></p> <p>Alpheus Mosane Simon Maleka</p>	<p><b>X</b></p>	<p>26/10/2021 (face to face)</p>	<p>Consult the LED director by means of sharing relevant documentation</p>	<p>Municipality officials were given BIDs to register and comment on the project.</p> <p>Kindly provide us with contact details of the LED Director</p>	
 <p>Keabetswe Mothupi Agnes Montwedi</p>	<p><b>X</b></p>	<p>21/10/2021 (via email)</p>	<p>No issue raised</p>	<p>Consultation email together with a BID were sent.</p>	
	<p><b>X</b></p>	<p>21/10/2021 (via email)</p>	<p>Requested a copy of Draft BAR &amp; EMPr.</p>	<p>A copy of BAR &amp; EMPr will be forwarded to you as soon as review period commence.</p>	

<b>I&amp;APs</b> List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.	<b>Date comments received</b>	<b>Issues raised</b>	<b>EAPs response to issues as mandated by the applicant</b>	<b>Section and paragraph reference</b> In this report where issues and/or responses were incorporated
Ramashala L Nemutandani Tendani				
<b>Organs of state (Responsible for infrastructure that may be affected: Roads Department, Eskom, Telkom, DWA)</b>				
 Mbengeni Tshidzumba	X	21/10/2021 (via email) Eskom Distribution will raise no objection, provided Eskom's rights are respected and acknowledged at all times.	Your Comments will be incorporated in the final BAR.	
 Suzan Aidelomo	X	No issue raised	Consultation email together with a BID were sent.	
<b>North West Provincial Government</b>				
 Eva Mahlangu	X	Requested a copy of Draft BAR & EMPr.	A copy of BAR & EMPr will be forwarded to you as soon as review period commence.	



<b>I&amp;APs</b> List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		<b>Date comments received</b>	<b>Issues raised</b>	<b>EAPs response to issues as mandated by the applicant</b>	<b>Section and paragraph reference</b> In this report where issues and/or responses were incorporated
  Tladi M	X	22/10/2021 (via email)	No issue raised	Consultation email together with a BID were sent.	
<b>Other competent authorities affected</b>					
  Marlize Friz	X	22/10/2021 (via email)	A copy of Draft BAR & EMPr was requested by Mrs. Friz.	A copy of BAR & EMPr will be forwarded to you as soon as review period commence.	
<b>Traditional leaders</b>					
<b>Bapong Tribal Council Authority</b>	X	10/11/2021 (face to face)	Requested that Jaments (applicant) should be present in the next meeting. Date to be confirmed after 25 <sup>th</sup> October.	Noted, we will notify Jaments (Pty) Ltd about your request.	

<b>I&amp;APs</b> List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.	<b>Date comments received</b>	<b>Issues raised</b>	<b>EAPs response to issues as mandated by the applicant</b>	<b>Section and paragraph reference</b> In this report where issues and/or responses were incorporated
<b>Other affected parties</b>				
<b>Interested parties</b>				

## **2.11 The environmental attributes associated with the alternatives.**

The environmental attributes described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects.

### **3 Baseline environment**

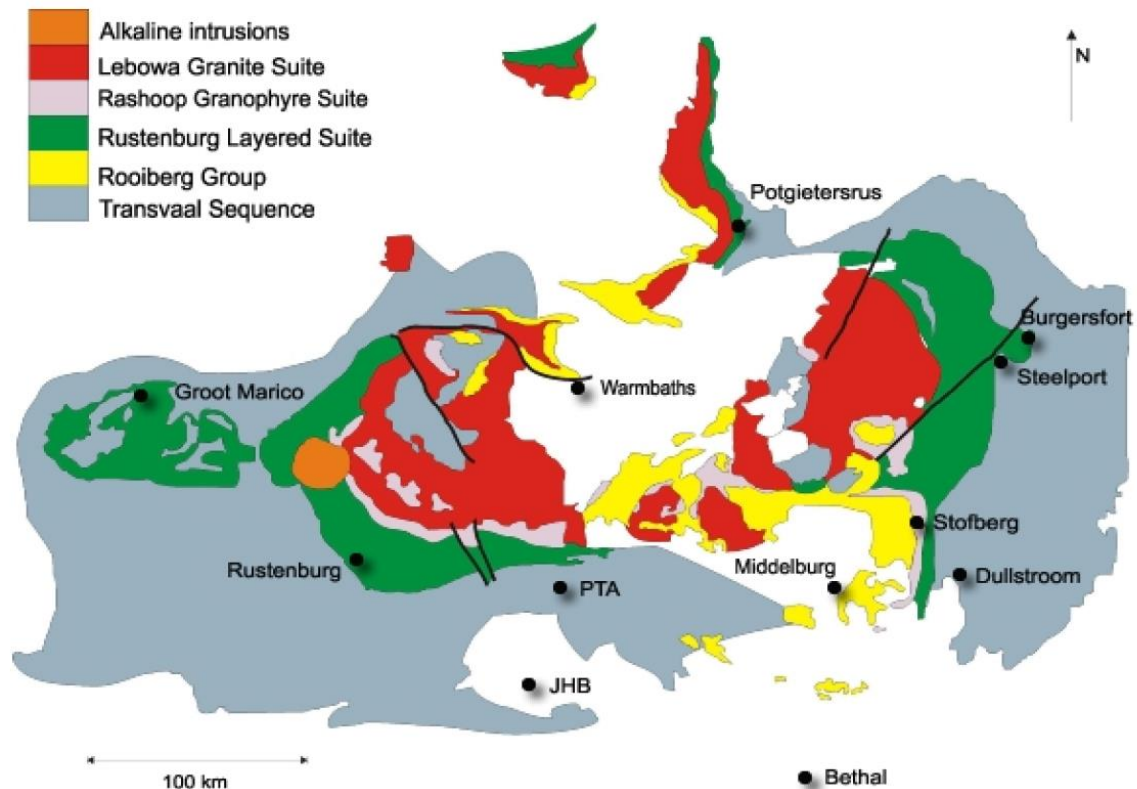
#### **3.1 Type of environment affected by the proposed activity**

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

##### **3.1.1 Regional geology**

The Bushveld Complex is by far the world's largest layered intrusion (Eales and Cawthorn, 1996), in terms of preserved lateral extent (Figure 1), covering an area of over 65 000 km<sup>2</sup>. It has a maximum thickness of 8 km, which is probably only matched in magnitude by the Windimurra intrusion (Mathison and Ahmat, 1996), although faulting and non-exposure make stratigraphic reconstruction of the latter uncertain, and the Stillwater intrusion, which has a preserve thickness of 6.5 km, but the upper portion has been removed by erosion (McCallum, 1996). Intrusion size is undoubtedly a major parameter for platinum mineralization. A typical mafic magma may contain only a few ppb of PGE and so to produce a large tonnage of ore at several ppm requires the concentration of the PGE from an enormous volume of magma. This is illustrated by the fact that the other primary PG E producers, Great Dyke (Wilson, 1996) and Stillwater (McCallum, 1996), are also very voluminous.

The complex also constitutes the world's most valuable mineral province (Naldrett 2009), hosting the bulk of global resources in PGE, Cr and V, with significant Cu, Ni, Au, Sn, fluorite, Fe and dimension stone (Wilson and Anhaeusser 1998), and, in the contact metamorphic aureole of the intrusion, the world's largest andalusite resources (Oosterhuis 1998). Clearly, a unique combination of petrogenetic processes has occurred, but an internally consistent petrogenetic model for the formation of the layered sequence hosting the PGE-, Cr- and V-rich layers has remained elusive, in part because a comprehensive compositional study covering the entire sequence has not yet been conducted. As a result, our understanding of the composition of the complex is still fragmentary.



**Figure 14: Simplified geological map of the Bushveld Large Igneous Province, which includes the Rustenburg Layered Suite, the Rooiberg Volcanics and the Lebowa Granite Suite .**

The Palaeoproterozoic Bushveld Igneous Province in South Africa is comprised of:

- ❖ a suite of mafic sills which intruded the floor rocks of Transvaal Supergroup
- ❖ the bimodal but predominantly Rooiberg Group volcanic province: one of the largest pyroclastic provinces on Earth covering at least 50 000 km<sup>2</sup> and up to 3 km thick
- ❖ the Rustenburg Layered Suite, the largest and oldest mafic layered complex on Earth which covers an area of approximately 65,000 km<sup>2</sup> and comprises anorthosites, mafic and ultramafic cumulates
- ❖ the Lebowa Granite Suite
- ❖ the Rashoop Granophyre Suite developed at the contacts between the granites and Rustenburg Layered Suite which is comprised of metamorphosed sediments and intrusive acidic rocks.
- ❖ various satellite intrusions of similar age including the Molopo Farms and Nkomati - Uitkomst.

### **3.1.1.1 Local geology**

These are igneous rocks that have been highly metamorphosed. They contain some of the Platinum Group Elements so are of economic importance. The site for development is on the Vlaktefontein Subsuite of the Bushveld Complex and is igneous in origin so does not preserve fossils of any kind.

#### **Marginal Zone**

This zone has a thickness ranging from zero to several hundreds of metres and consists largely of quenched to fine grained norites in contact with the Lower Zone (B-1 suite) or very fine grained to fine-grained gabbro-norite in contact with Critical Zone (the B-2 suite) and Main Zone (B-3 suite) (Sharpe, 1981). Xenoliths of quartzite (e.g., on the Clapham farm) and dolomite (e.g. on Hendriksplaas) locally attest to interaction with the floor rocks. Less common are anorthosite xenoliths (Bristow et al., 1993). Quartzite is known to have approximately 99% of silicon dioxide (SiO<sub>2</sub>), hence it is considered as a host rock of silicon (Si).

#### **Lower Zone (LZ)**

The LZ on the western limb of the complex consists predominantly of harzburgite and dunite (Teigler and Eales, 1996) as well as orthopyroxenite. Plagioclase is not present as a cumulate phase, with the exception of a ~90-cm norite layer midway up the sequence that has been delineated in both the western and eastern limbs of the complex (Teigler, 1990; Lee and Tredoux, 1986). Amongst other LZ rocks, the dunites are closest to monomineralic compositions, forming olivine adcumulates with only minor orthopyroxene oikocrysts. Plagioclase, clinopyroxene and other minor minerals comprise up to approximately 10 % of most other LZ samples, apart from the basal 50 m of the intrusion where these components reach approximately 30%. Chromite makes up <1 modal% in most LZ rocks, irrespective of lithology.

Notably, the LZ shows more pronounced lateral variation in thickness and lithology than the overlying stratigraphic intervals. In some trough structures, it reaches a thickness of >1 km, for example, in the Olifants River trough at Cameron Section or near Burgersfort in the eastern lobe (Button, 1976; Wilson and Chunnnett, 2010), but it is thinner or absent above swells between the troughs. Facies changes of the LZ across the swells indicate that compartmentalization was effective during crystallization (Scoon and Teigler, 1994). This is also expressed in the lithological and compositional variation of the LZ between limbs.

### **Lower Critical Zone (LCZ)**

This zone is approximately 700–800 m in thickness and consists predominantly of orthopyroxenite (Teigler and Eales, 1996). Harzburgitic rocks occur within two intervals, including the C1 unit of Cameron (1982) where harzburgite is finely interlayered with orthopyroxenite. There are nine major chromitite seams (Lower Group or LG seams 1–7 and Middle Group or MG seams 1–2), of which LG6 hosts the largest chromite reserve on Earth (Crowson 2001). The seams have been correlated, albeit at variable thickness, across much of the complex (Cousins and Feringa, 1964; Teigler et al., 1992; Teigler and Eales, 1996), highlighting that the LCZ shows less pronounced lateral variation than the LZ. The base of the LCZ has been defined as the level where there is a significant increase in intercumulus plagioclase (Cameron, 1978).

### **Upper Critical Zone (UCZ)**

UCZ is defined by a laterally continuous, 1–3 m thick anorthosite layer that overlies orthopyroxenite with a sharp but undulating contact marked by a 1–2-mm chromitite stringer and, in places, an overlying 1–2 cm selvage of anorthosite adcumulate. In the northern limb, fine-grained UCZ rocks overlie thick harzburgites which is believed to be the LZ, implying that the LCZ could be absent (Hulbert, 1983; Maier et al., 2008). In addition, the contact sequence between the LZ and the UCZ locally contains large xenoliths or rafts of quartzite and dolomite (Hulbert 1983; Maier et al., 2008; Yudovskaya et al., 2012). These field relationships suggest that, along the northern limb, the LZ and UCZ may form distinct sill-like intrusive bodies. Chromite is a trace component in most UCZ rocks, but the mineral may be locally concentrated to form bedding-parallel schlieren. In addition to disseminated chromite, the UCZ contains four to five major chromitite seams, including Middle Group (MG) seams 3 to 4 and Upper Group (UG) seams 1 to 2 in the eastern lobe as well as dozens of minor seams and stringers, including those below the UG1 chromitite, above the UG2 and bracketing the Merensky Reef pegmatoid. The Bushveld chromitites contain variable gangue contents that progressively increase with height (de Waal, 1975; Maier and Barnes, 1999), with the UG seams having up to 40 % gangue component.

A feature that is particularly characteristic of the UCZ is the occurrence of cyclic units (Cameron, 1982; Eales et al., 1986; 1988; 1990). The base of the units typically consists of ultramafic rocks (i.e. chromitite and/or harzburgite and/or pyroxenite) that are overlain by progressively more feldspathic rocks (i.e. first norite and then anorthosite). The units have thicknesses between a few millimetres to several tens of metres, exceptionally

reaching several hundreds of metres (in the cyclic unit overlying the MG4 chromitite; Eales et al., 1990). Platinum-group element mineralization tends to be concentrated in the basal ultramafic portions of the larger units, particularly in the case of the economically important Merensky Reef and UG2 chromitite, as well as the sub-economic Pseudo Reef harzburgite and Bastard Reef pyroxenite.

### **Upper Zone (UZ)**

The UZ is approximately 1–2-km-thick and has traditionally been sub-divided into three subzones based on cumulate mineralogy. Sub-zone A contains cumulus plagioclase, low-Ca pyroxene and magnetite. In sub-zone B, olivine becomes an additional cumulus phase. Sub-zone C is defined by the appearance of apatite and is also characterized by the occurrence of numerous large country rock xenoliths. Subzones A and B consist of cyclic units of magnetite, gabbronorite and anorthosite. In sub-zone C, granular ilmenite is present in the oxide layers, and the cyclic units consist of Fe oxide layers overlain by ferro-diorites (Molyneux 1970; von Gruenewaldt 1971). If Kruger's proposal is accepted, i.e. to place the base of the UZ at the level of the Pyroxenite Marker, the nomenclature for the subzones has to be revised, with the interval above the Pyroxenite Marker constituting sub-zone A and the overlying rocks forming subzones B to D. The number of magnetite layers varies between localities. In the northern limb of the complex, 16 layers have been recorded (Barnes et al. 2004), whereas up to 26 layers are known from the eastern and western limbs (Cawthorn and Molyneux 1986; Tegner et al. 2006). The oxide layers are between a few centimetres to >10 m in thickness (magnetite layer 21) and many contain abundant anorthosite xenoliths. Most layers have sharp lower contacts, but the upper contacts may be gradational.

#### **3.1.1 PGMs and Chrome ore Mineralisation**

The Merensky Reef has traditionally been the most important platinum producing layer in the Bushveld Complex. Seismic surveys undertaken by the Council for Geoscience indicate that reflectors associated with the Merensky Reef can be traced as far as 50km down dip, to depths of 6,000m below surface. The Merensky Reef varies considerably in its nature but can be broadly defined as a mineralised zone within, or closely associated with the ultramafic cumulate at the base of the Merensky cyclic unit. In addition to the PGM mineralisation associated with the Merensky Reef, all chromitites in the Critical Zone

at times contain elevated concentrations of PGMs. The UG2 Chromitite Layer is the only chromitite layer that is significantly exploited for PGMs at present.

The major geological features that affect the UG2 Chromitite Layer are faults, dykes, potholes and mafic/ultramafic pegmatites. Potholes are features of subsidence or erosion where the igneous layer is absent or occurs at a lower elevation in a modified form. Typically, the PGM concentration and the thickness of the layer are modified. Potholes typically approach a circular shape. Potholes occur within all stratigraphic units of the Bushveld Complex including the MG Chromitite Layer. Poor ground conditions may be associated with potholes and pothole edges. On some mines, such as Bokoni (formerly known as Atok) and Northam, potholes may cause a geological loss of ground of up to 25%.

Another unique feature of the geology of the Bushveld Complex is the mafic/ultramafic pegmatites sometimes referred to as iron rich ultramafic pegmatites (IRUP's) or replacement pegmatites.

### **3.1.2 Chrome, Iron, Copper and Nickel Mineralisation**

The Bushveld Complex hosts stratiform chromite deposits that are present as layers of massive chromitite. These layers are present in the Critical Zone and have been designated as the Lower Group (LG), MG and UG Chromitite Layers. The lower Critical Zone is host to the LG Chromitite Layers that consists of seven chromitite layers. The thickest and most significant being the LG6 Chromitite Layer. The MG Chromitite Layers consist of five individual chromite packages of which three are in the lower Critical Zone and two are in the upper Critical Zone. There are two UG Chromitite Layers with the UG2 Chromitite Layer being the most significant as a major source of PGM mineralisation.

The LG6, MG1 and UG2 Chromitite Layers are the most exploited because of their mineralogical composition and because they can be mined by mechanised equipment both in open pit and underground. The LG6 Chromitite Layer is typically up to 1.05m thick and has a Cr<sub>2</sub>O<sub>3</sub> grade of 46% to 48% and a Cr:Fe ratio of 1.56 – 1.60. Locally the LG Chromitite Layers may have much higher Cr:Fe ratios such as at Grasvaley (2.13 – 2.83) and Nietverdeind (1.88 – 2.06). The grade at Nietverdiend ranges from 48% to 51% Cr<sub>2</sub>O<sub>3</sub>. The UG2 Chromitite Layer is typically up to 1m thick and has a Cr<sub>2</sub>O<sub>3</sub> grade of 43.6% and a Cr:Fe ratio of 1.26 to 1.40. It has a significant PGM grade and so has been mined extensively to recover the PGMs.

The UG2 (Upper Group 2) chromitite layer in the upper Critical Zone is probably the



largest PGE resource on Earth although all the chromitite layers contain elevated levels of PGE's. The UG2 occurs 15-400m below the Merensky Reef, with the smallest vertical separation in the western and greatest in the eastern Bushveld (Lee, 1996). The layer is 0.5 –1 m thick generally with a pegmatoidal feldspathic pyroxenite footwall, and more rarely anorthosite. Potholes are a common feature of the UG2. Two to four minor chromitite leaders occur in the hanging wall. The chromite content is 60-90%, with an average Cr/Fe ratio between 1.26-1.4 with 43.5% Cr<sub>2</sub>O<sub>3</sub>. The PGE are interstitial to the chromite grains and the only PGM commonly enclosed by chromite is laurite. PGE contents are up to 10 ppm PGE + Au (3.6 ppm Pt, 3.81 ppm Pd, 0.3 ppm Rh) Cu and Ni are low generally less than 0.05% and the amount of accessory base metal sulphides is low (Lee, 1996). There are frequently two peaks in the PGE distribution (Hiemstra, 1985). The Pt:Pd ratio varies with geographic location.

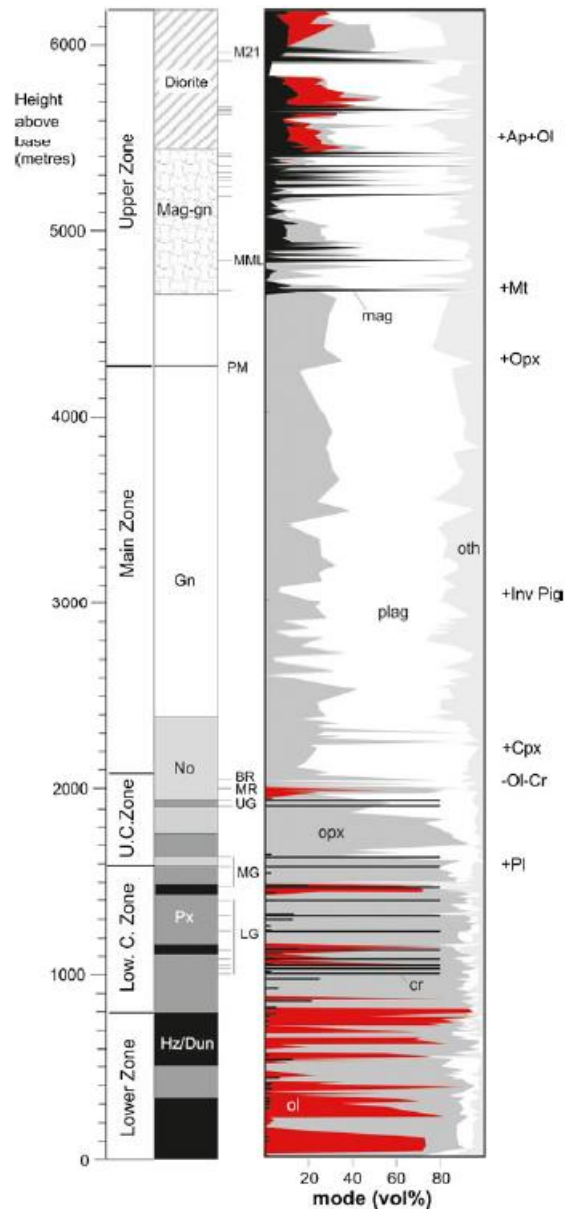


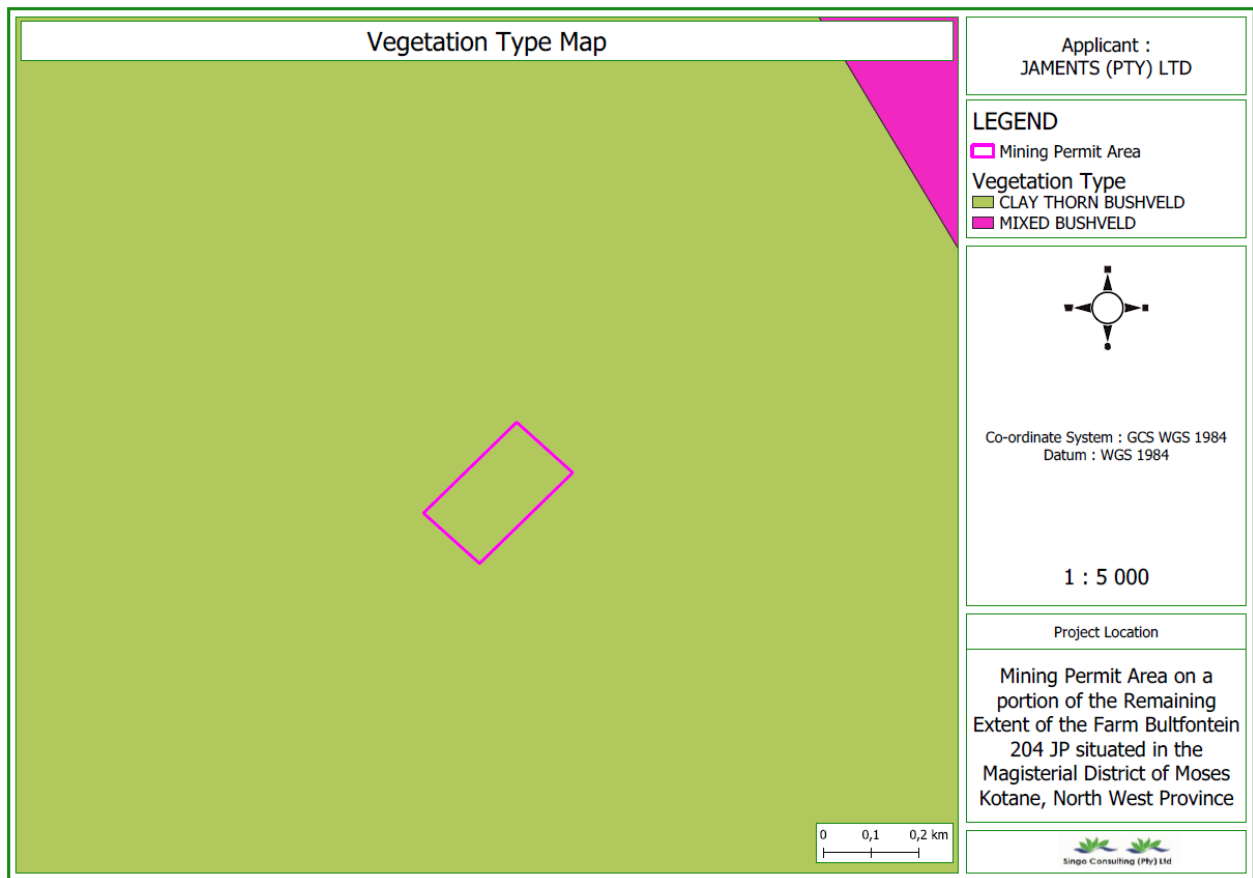
Figure 15: Typical stratigraphy of the Rustenburg layerd suite.

### 3.1.2.1 Natural vegetation

The desktop study indicated that the project area falls within the Savanna Biome, which is the largest Biome in southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the lowveld and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia, and Zimbabwe. It is characterized by a grassy ground layer and a distinct upper layer of woody plants. Where this upper layer is near the ground the vegetation may be referred to as “shrubveld”, where it is dense as Woodland, and the intermediate stages are locally known as Bushveld.

Most of the savanna vegetation types are used for grazing, mainly by cattle or game. In the southernmost savanna types, goats are the major stock. In some types crops and

subtropical fruit are cultivated. These mainly include the Clay Thorn Bushveld, parts of Mixed Bushveld, and Sweet Lowveld Bushveld.



**Figure 16: Vegetation type of the project area.**

According to the screening report the area is characterized with medium sensitivity of *Cullen holubii*. The habitat of this species is at least 60% transformed and is classified as endangered by the National Spatial Biodiversity Assessment (Rouget et al. 2004). Most of the past transformation is as a result of agriculture, but there is also likely to be ongoing habitat loss due to expanding rural settlements, overgrazing and alien invasive encroachment (Mucina and Rutherford 2006).

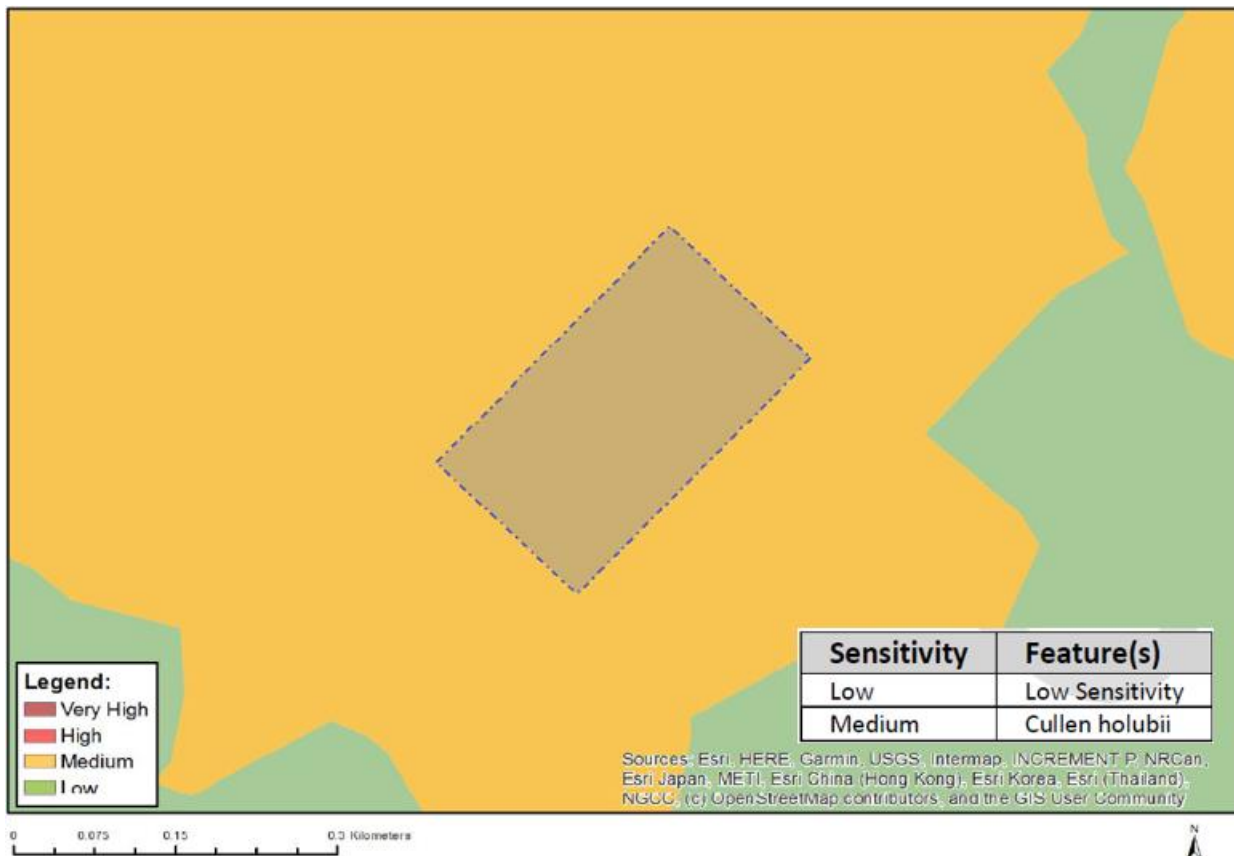


Figure 17: Plant species theme sensitivity.

During site assessment *Vachellia tortilis* subsp. *tortilis* was observed. This is a white thorn tree which is known to reach heights of between 5 and 20 m in nature. It is fairly slow-growing and in cultivation reaches a final height of between 3 and 5 m with a spread



of 8-13 m. In extremely arid conditions, it may occur as a small, wiry bush.



**Figure 18: the observed plants on site.**

The bark on the trunk is rough and varies from medium grey to almost black, with somewhat tortuous longitudinal fissures. On main branches the covering is dark and fissured. Branches about 40 mm in diameter are a dark grey with occasional blackened fissures here and there. Branchlets about 10 mm in diameter vary from olive green to brown or purplish. There are some interesting variations in the armature.

The thorns are in pairs at nodes which may be spaced at as little as 5 mm near tips, but up to 10-20 mm further down. Straight and hooked thorn pairs usually alternate at consecutive nodes, but a pair may comprise one hooked and one straight thorn.





Figure 19: Typical example of *Vachellia tortilis* subsp. *tortilis* (adopted from pza.sanbi.gov).

### 3.1.2.2 Fauna

According to the screening report, the project area has low fauna sensitivity as indicated in **Figure 20** below. However, during site assessment cattles were found within the farm grazing.



Figure 20: Animal species theme sensitivity.



**Figure 21: Cattles observed during site Assessment**

### **3.1.2.3 Soil**

From a desktop study that was conducted, a map in Figure 22 was produced. This map shows that the mining permit area is covered with swelling clay soils. The swelling clay soils can be defined by its high natural fertility, high swell-shrink potential, very plastic and sticky. Clay soil has a high shrink-swell capacity. As the particles shrink, they separate and cause cracks, from a very thin thickness to an inch or more. In dry weather, the clay particles shrink and come closer together. the cracks in the ground are caused by shrinking.

Clay floors are very sticky to the touch and roll like play dough when wet. They can hold more water than most other types of soil, and although only half is available to plants, plants rarely suffer from drought. They swell when wet and shrink when dry, so some restructuring can occur in these soils, depending on the weather.

They remain wet in winter and must therefore be removed from the ground to avoid poaching (compaction of the soil by the hooves of animals). They heat up very late in the spring because water heats up slower than minerals.



**Figure 22: Soil classification map.**

The identified soil classification of the mining permit area was confirmed during site assessment. The soil was confirmed to be clay soil which is grey to black in colour as indicated in **Figure 23**.





Figure 23: Actual soil type as observed from the site assessment conducted (clack clay soils).

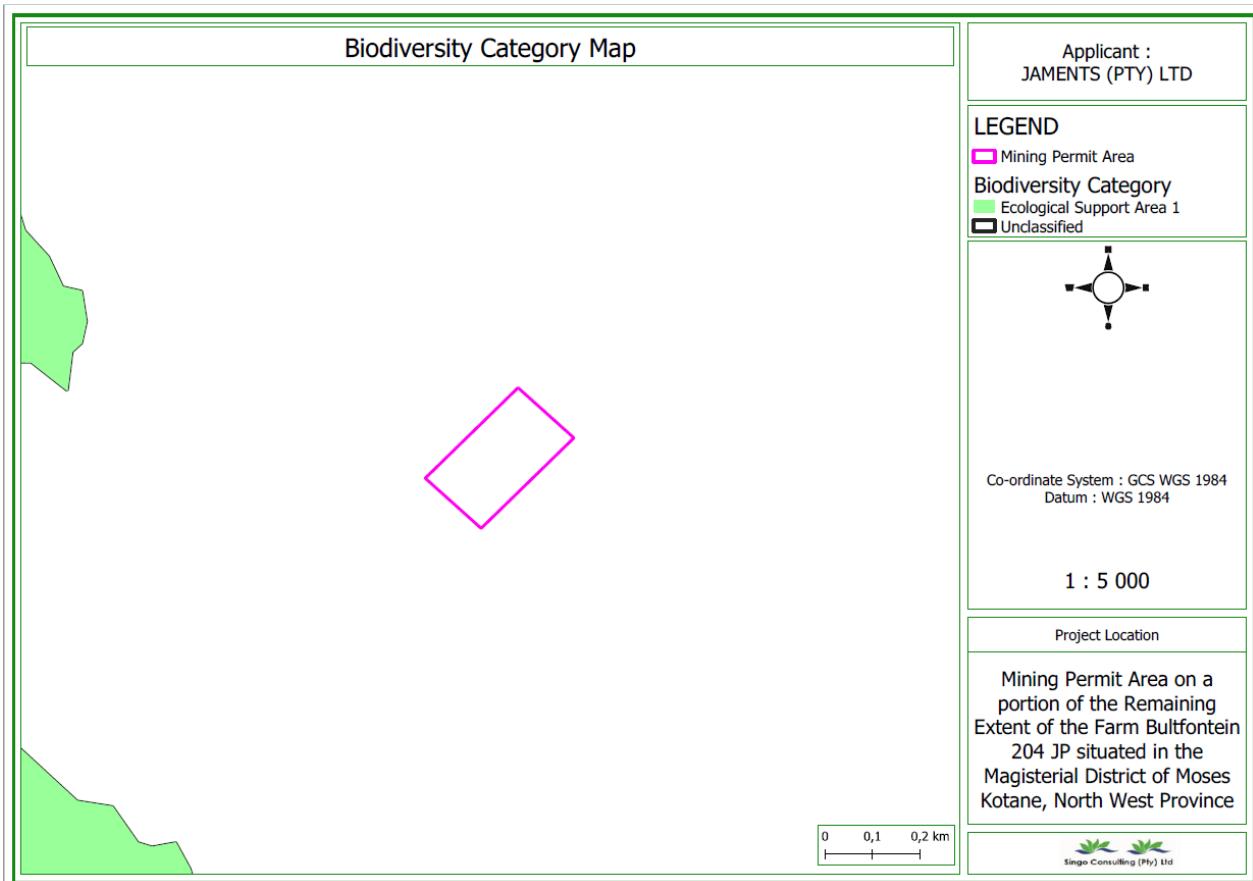


Figure 24: Sensitive biodiversity and wetlands map.

### 3.1.2.4 Surface and ground water

#### Surface water

The prospecting area falls within the Limpopo Water Management Area (WMA). The farm portions of the prospecting right fall within the quaternary catchment A22E. The Figure below illustrates the Quaternary catchment and the Water Management Area (WMA).

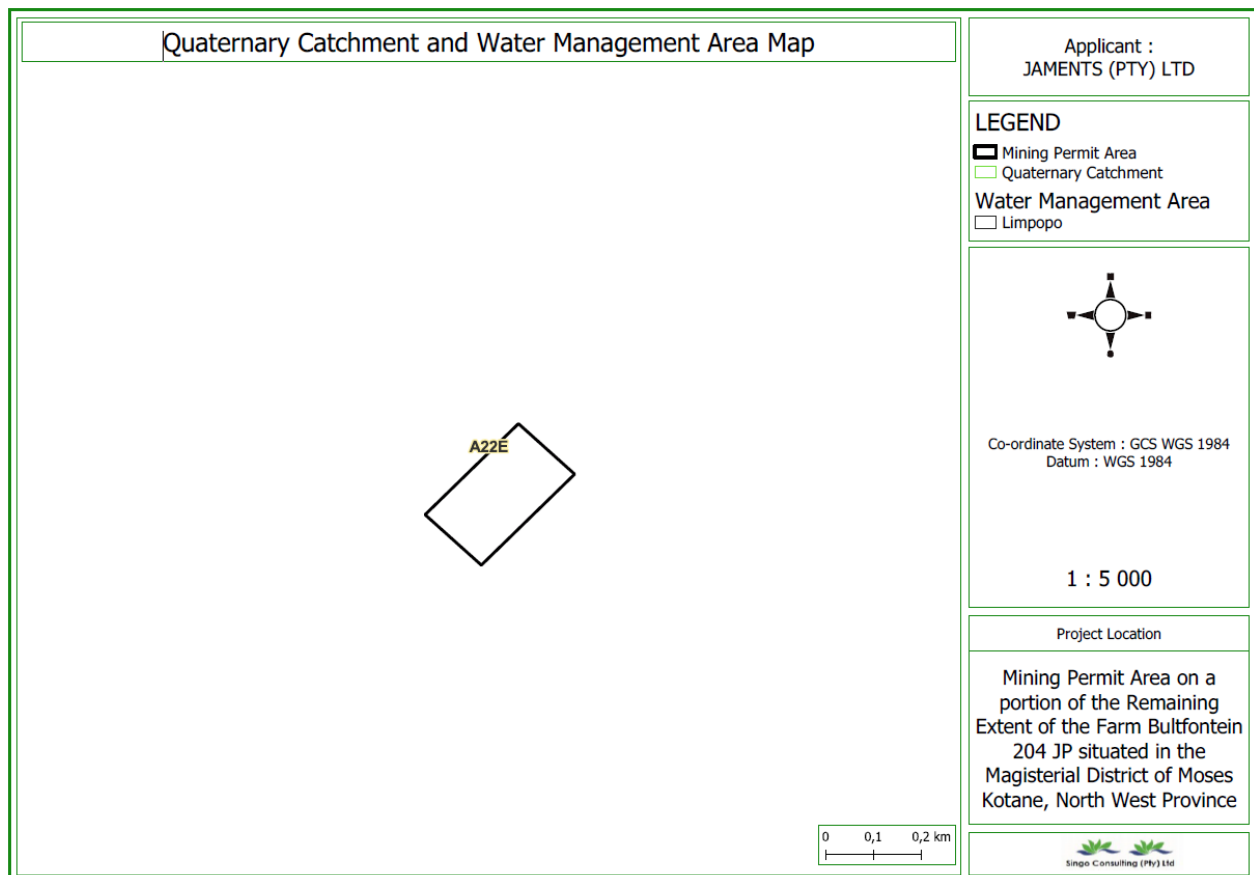
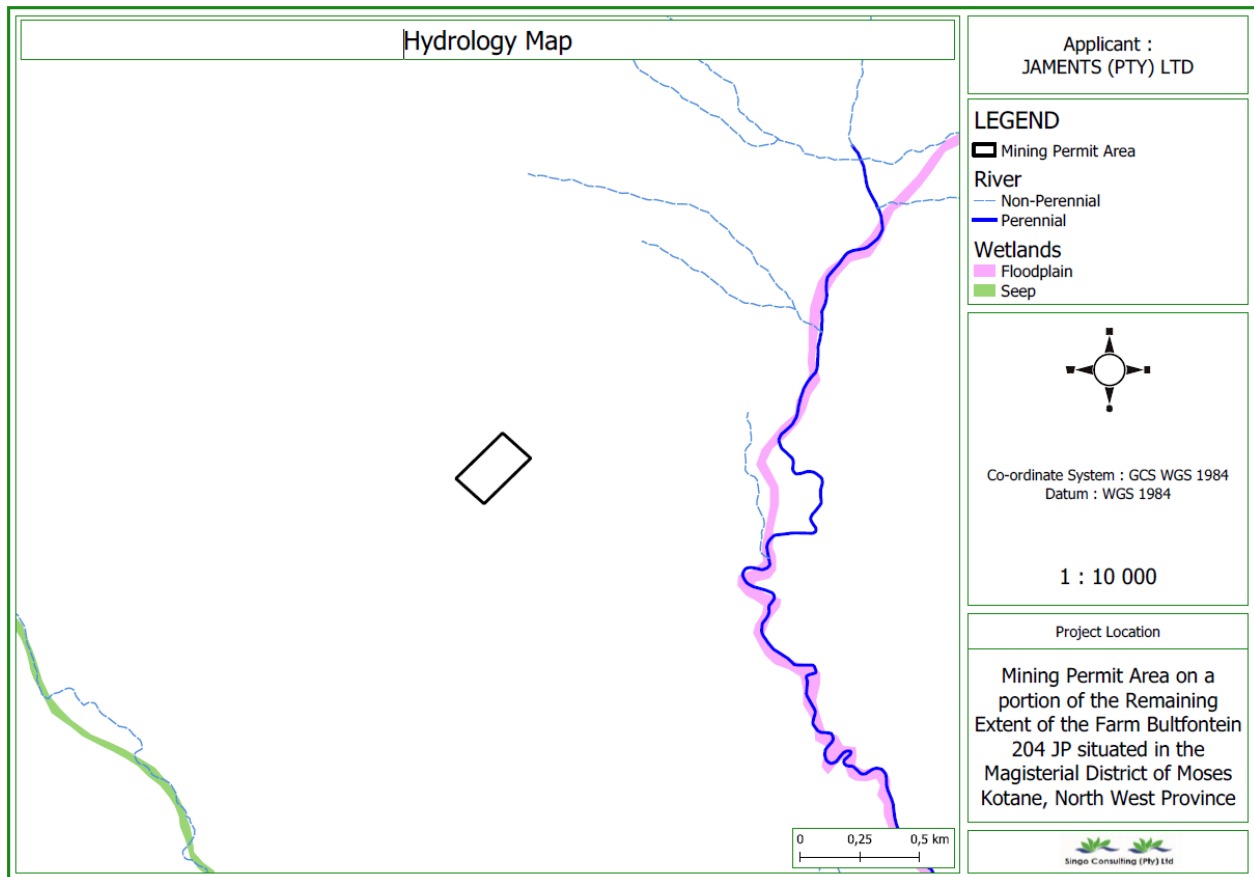


Figure 25: Quaternary catchment water management area.

The hydrology surrounding the proposed area is very importance during prospecting. In this context hydrology is all the surface waters appearing within and nearby the proposed project area, where a potential to be impacted upon by the project exist. The hydrology map, illustrates that the following water bodies exists:

- ❖ Floodplain
- ❖ Seep
- ❖ Non-perennial river
- ❖ Perennial river



**Figure 26: Surface water around the project area.**

No indications of a wetland were noted during the site visit.

### **Ground Water**

According to (Gebrekristos & Cheshire , 2012) It is commonly accepted that three types of aquifers exist in the Bushveld Complex: (a) alluvial aquifers in areas of river courses, (b) weathered bedrock aquifer formed by the in-situ weathering of the bedrocks, (c) fractured aquifers underlying the weathered aquifers controlled by the regional and local fracturing of the crystalline rocks.

Hydrogeological studies conducted in the Critical Zone of the Bushveld Complex in the western limb show that the UG2 pyroxenite layer is of a particular interest and has a unique aquifer property. It yields much of the groundwater inflow into some mines and can be classified as the most important aquifer in the vicinity of the mining zone. The UG2 pyroxenite aquifer is restricted to the dipping UG2 pyroxenite unit. The unit weathers more intensely than the surrounding norites and anorthosites and is characterized by deeper weathering horizons (two to three times deeper than the surrounding rocks). For much of

the UG2 mining area between depths of 35 – 80 m, stoping of the UG2 takes place approximately 5 – 7 m below the UG2 pyroxenite aquifer, and usually there is no groundwater inflow into the mine workings. However, unsealed deep exploration boreholes intersecting the UG2 pyroxenite and reaching underground mine workings, or mine roofbolts penetrating the weathered pyroxenite aquifer from underneath, can result in significant groundwater inflows into the underground workings.

The reason as to why the UG2 pyroxenite weathers more than the norites and anorthosites has not been fully studied but is suspected to be due to the bedding planes of the unit and mineralogical composition of the particular pyroxenes forming the unit, which result in preferential physical and chemical weathering under atmospheric conditions. The weathered pyroxenes form sand-sized, rounded grains with improved effective porosity and permeability suitable for the storage and passage of groundwater. The orientation of the pyroxenite aquifer can easily be determined as it dips with the Bushveld layered strata. No-flow boundaries can be assumed on the hanging- and footwall of the pyroxenite aquifer and the flow rates can be estimated using 2-dimensional analytical equations.

Groundwater conditions and aquifer systems of the Bushveld Complex (BC) have been studied by various researchers, such as Titus et al., 2009, and their hydraulic properties can be classified into three types:

- ❖ Alluvial aquifers on the banks of river or stream courses
- ❖ Weathered bedrock aquifers formed by the in-situ weathering of the BC crystalline rocks
- ❖ Fractured aquifers underlying the weathered aquifers controlled by the regional and local fracture systems.

The alluvial aquifers are composed of unconsolidated layers of gravel, sand, silt, or clay deposits. They are often unconfined and are laterally discontinuous, being localized within the immediate vicinity of the river banks and floodplains. These aquifers are fairly high yielding due to their interaction with the surface water bodies, coupled with the relatively high storage and permeability of the unconsolidated sediments. The permeability is, however, dependent on the particle size and low-yielding zones have been encountered based on the clay content.

The upper part of the bedrock is often weathered by chemical and mechanical means to form a variably permeable, fractured and porous rock mass from surface to depths of

approximately 35 m below ground level. This is a separate aquifer layer with different hydraulic properties from the overlying alluvial aquifers and underlying fresh crystalline rocks. The depth of the weathered zone is dependent on the parent rock type and site-specific physiochemical conditions.

The crystalline rocks below the weathered zone form aquitards (poor aquifers) if no secondary fractures are developed, due to the insignificant pore spaces between the individual mineral crystals that are not connected to each other. If secondary fractures (regional or local) exist, however, high-yielding aquifers can develop and boreholes in these can provide considerable water. These aquifers are often connected with the weathered aquifer and have been encountered to depths of 130 - 140 m below ground level.

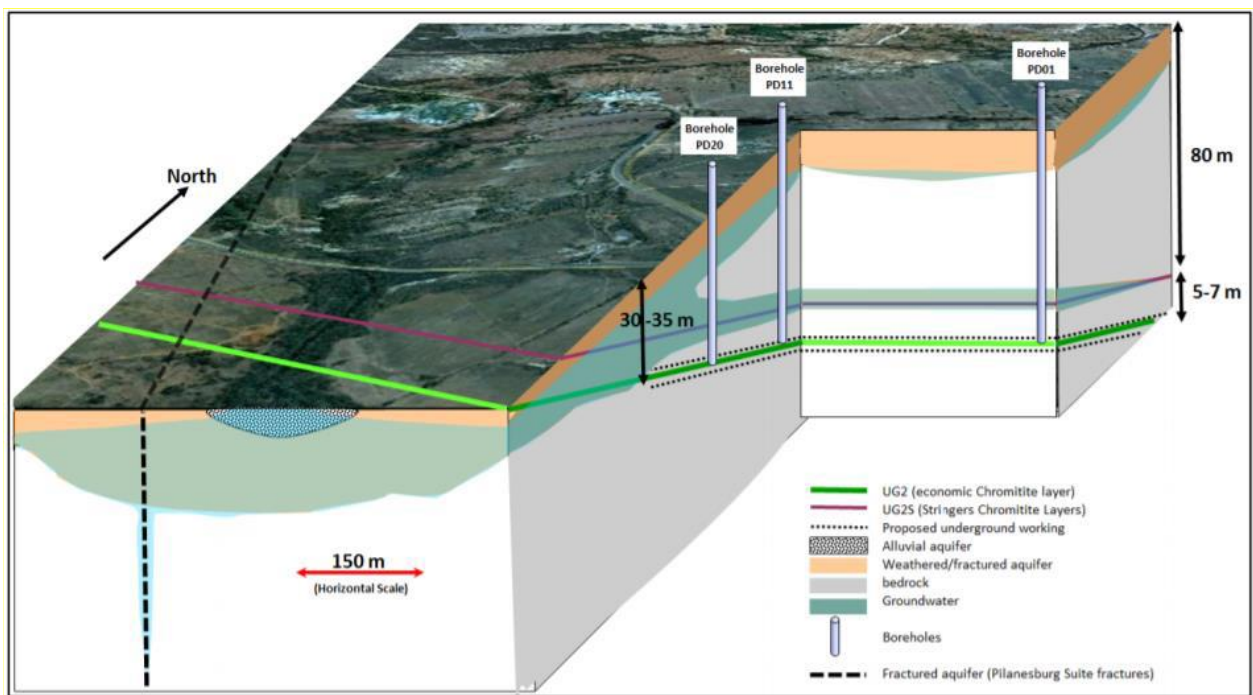


Figure 27: A simplified hydrogeological conceptual model of the Bushveld complex illustrating the pyroxenite aquifer (Source: (Gebrekristos & Cheshire, 2012))

### 3.1.2.5 climate

Rustenburg lies 1156 m above sea level. The climate of Rustenburg is a local steppe climate with little rainfall throughout the year. The Köppen-Geiger climate classification is BSh. The average annual temperature is 18.9 °C in Rustenburg. According to **Figure 27** the mean annual rainfall is between 401-600 mm. The driest month is July with precipitation of 3 mm. Most precipitation falls in December, with an average of 117 mm. January is the warmest month with an average of 28 °C. According to **Figure 28**, the mean annual temperature of Bapong 2 village is between 2.1 - 4°C. The lowest temperature is in June which is 6 °C. The precipitation of 149 mm varies between the driest and the wettest months. The average temperatures vary during the

year by 9.7 °C. (Source: <https://en.climate-data.org/africa/south-africa/north-west/rustenburg-646/> )

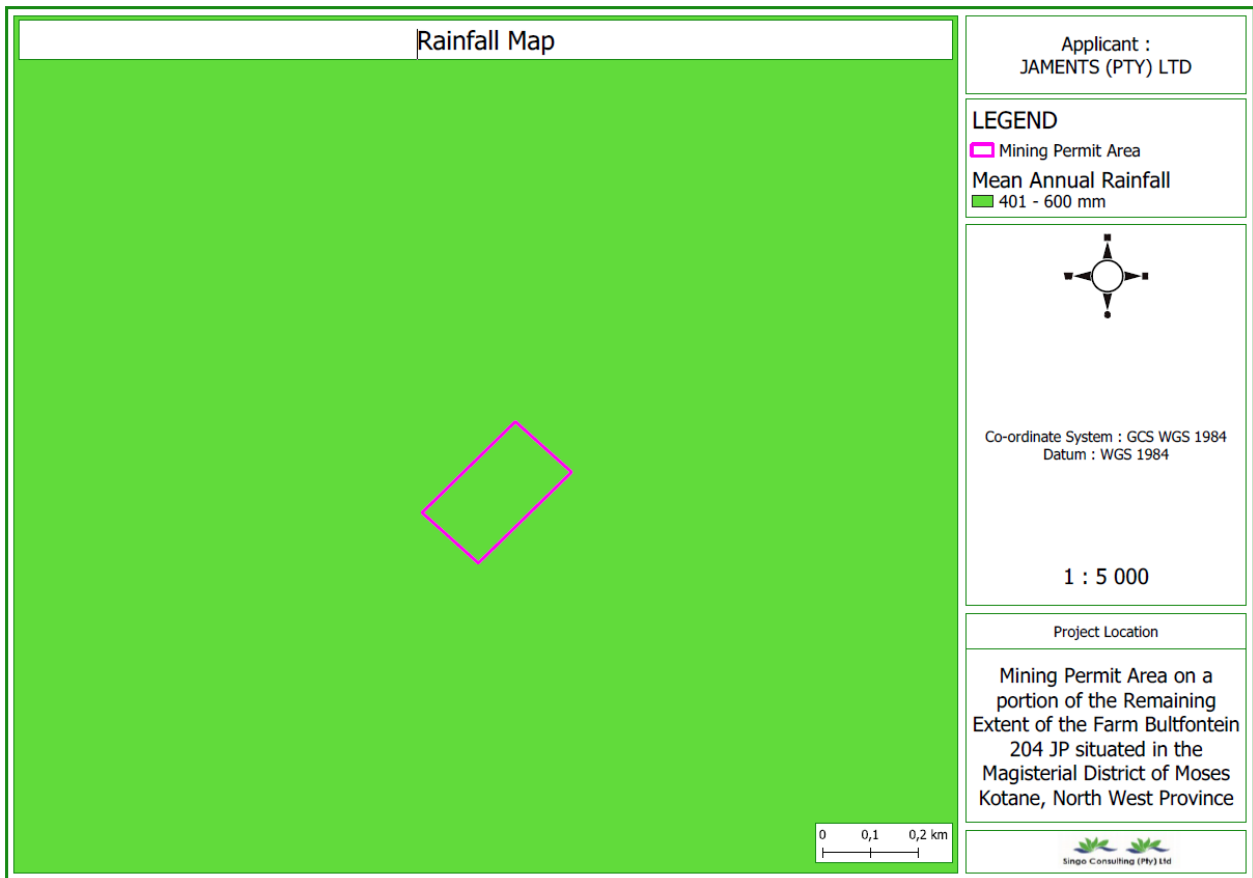
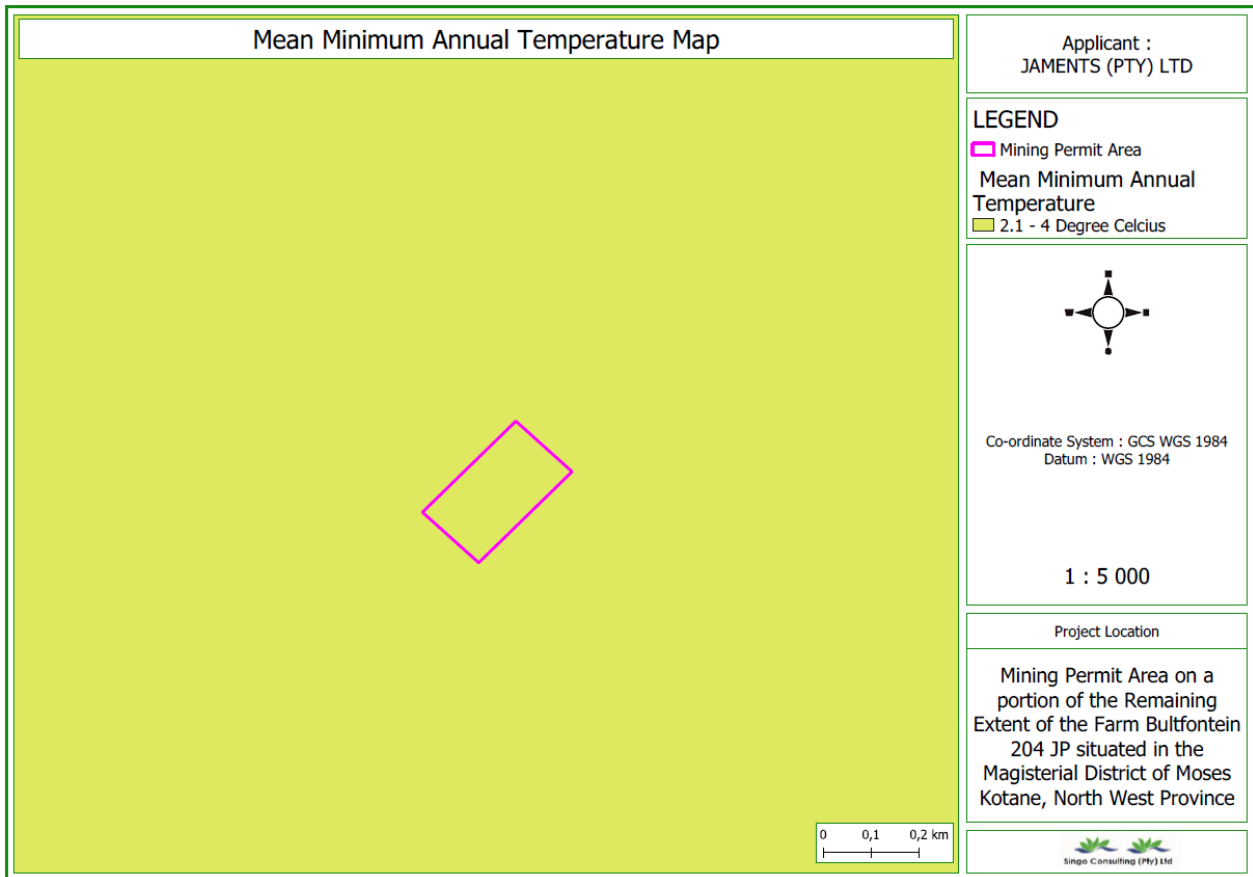


Figure 28: Mean annual rainfall.



**Figure 29: Mean minimum annual temperature.**

### 3.1.2.6 Topography

The proposed prospecting area is characterized by gentle slopes surfaces and the map shows no signs of mountains or hills near or within the project area. This can be observed on the topography map attached below. The flow of water during rainy seasons flows from the area of high elevation to the area of low elevation as it is indicated by contour lines.

In this environmental project, topography is used to determine how soil can be conserved and how water will flow over the land. Data from topography can help to conserve the environment. By understanding the contour of the land, scientists can determine how water and wind may cause erosion. They can help to establish conservation areas such as watersheds and wind blocks. In this project contour lines indicates a lower chance of soil erosion as they are sparsely packed.



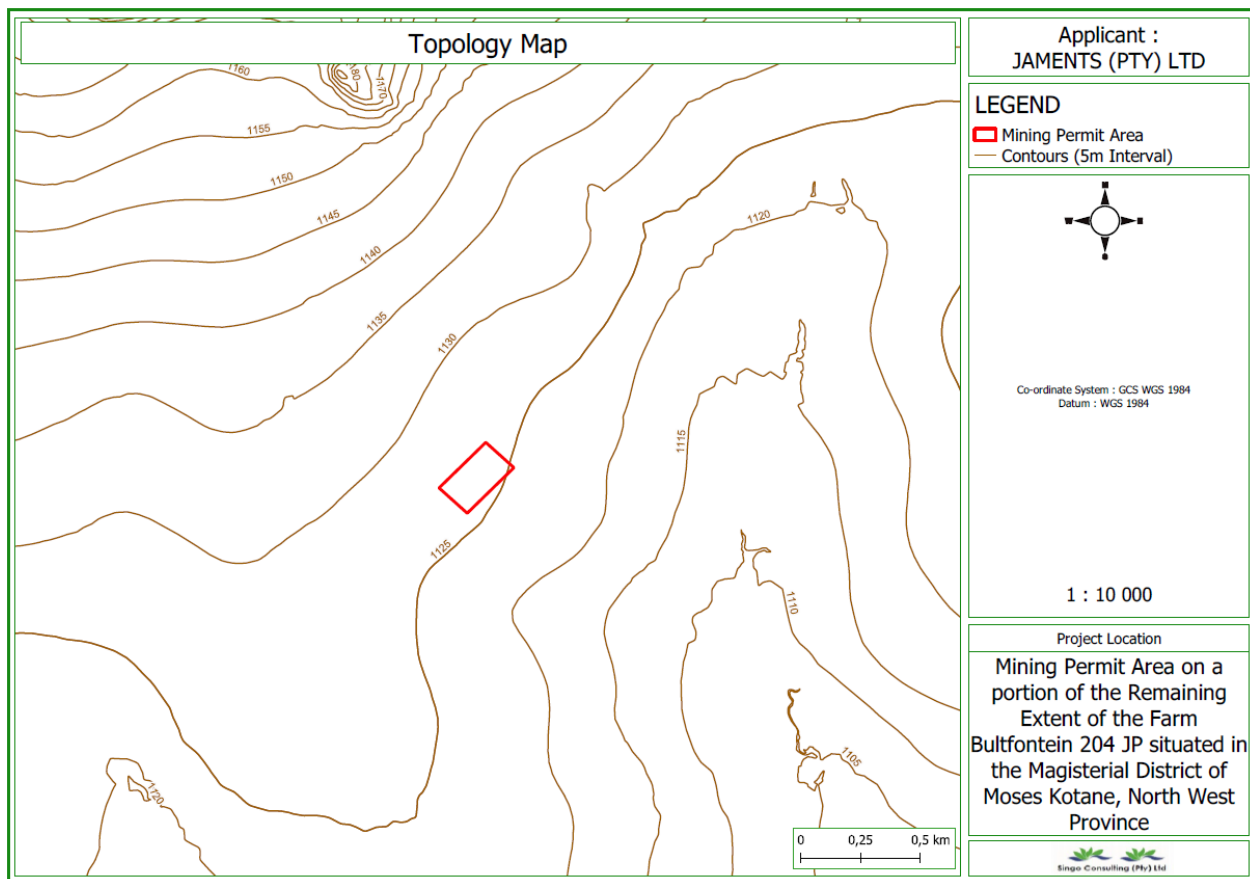


Figure 30: Topogy of the project area.

### 3.1.2.7 Public road

The site is located close to the R565 provincial road. The R565 provincial road between Phokeng and Bapong is located about 400m away from the northern boundary of the site. The R565 provincial road is a Class 2, single carriageway, major transient route.

### 3.1.2.8 Graves, heritage, archaeological and cultural resources

There are no archaeological or heritage resources at surface on the project area.

### 3.1.2.9 Railway line

There is no railway line that runs from the proposed prospecting area. No mining will be conducted within 100 m of railways, road, power lines, graves/historically significant structures, etc.

### 3.1.2.10 Noise

The major contributing factor to the ambient noise level of the site would be as a result of:

- Traffic utilizing the R565 provincial road;



- Traffic utilizing the gravel access road;

### 3.1.2.11 Visual exposure

The site slopes gently in a north easterly direction towards the R565 provincial road. The site is vacant. The site is not visible from the R565 provincial road located on the northern boundary.

### 3.1.2.12 Socio-economic

#### Population demographics

Moses Kotane Local Municipality is located within the Northwest Province and is situated in the jurisdictional area of Moses Kotane Magisterial District Municipality. Moses Kotane Local municipality was estimated to have a population of about 242 553 by 2011 census compared to 237 175 by census 2001. The Municipality is dominated by African population with fewer Indian, Coloured and with whites staying at Sun City and Mogwase unit 2. The municipality covers an area of approximately 5220 km<sup>2</sup> and most of it is in rural in nature comprising of 107 villages with 2 formal towns of Mogwase and Madikwe.

Demographic Indicators				
<b>Census 1996</b>	Male	108313	Female	121308
<b>Census 2001</b>	Male	115715	Female	121460
<b>Census 2011</b>	Male	120515	Female	122038
<b>Population Growth(2001-2011)</b>	<b>0.22</b>			

Racial Composition / Population Group	Population group	Male	Female	Total
	Black African	118092	120424	238516
	Coloured	325	294	620
	Indian or Asian	837	363	1200
	White	989	840	1829

Figure 31: Demographics indicators of Moses Kotane Local Municipality, source- IDP 2017 – 2022.

### 3.1.2.13 Education

Education One of the key elements to understand the socio-economic characteristics of an area is to measure the level of education that residents have obtained. The level of education has a direct bearing on the various other socio-economic characteristics within an area. In general, low levels of education imply lower quality of life.

The proportion of residents within the Moses Kotane LM (11.9%) who have completed matric is much lower than the percentage of residents that have completed matric within the Bojanala PDM (14.9%). Furthermore, only 0.9% of the residents within the Moses Kotane LM have obtained a higher level of education.

#### **3.1.2.14 Employment and income**

A relatively higher proportion (30.6%) of the residents within the Moses Kotane Local Municipality received no income. Approximately 22.2% of the residents within the local municipality earned between R 8 590 and R 17 177 per annum or between R 716 and R 1 431 per month. The level of income identified for the Moses Kotane LM is generally low and indicates that most households within the local municipality do not earn a sufficient level of income in order to meet their needs and the needs of their dependents.

According to the Guidelines to Regional Socio-Economic Analysis, the participation rate indicates the labour force as a percentage of the population in the age group 15 – 64 years old.' The document also indicates that these rates indicate the percentage of the population that is actually economically active. In other words, this rate indicates that the proportion of the population that is employed or is actively looking for employment opportunities relative to the number of people that are of a working age. It should be noted that the participation rate for the Moses Kotane LM is 56.9. This indicates that slightly more than half the people within the local municipality that can work are employed. This is comparatively lower to some of the co-municipalities such as Rustenburg (73.8) and Madibeng LM (63.8). A likely explanation for the low participation rate within the Moses Kotane LM is that job seekers have given up on finding a job and therefore they are not classified as economically active. This indicates that it is possible that the unemployment rate for Moses Kotane is higher than the official rate of 33.5% indicated previously.

#### **3.1.2.15 HIV, health and wellbeing**

The Municipality does not have a focal person for HIV/AIDS. As a municipality we are not sure of the impact of HIV/Aids in the workplace, particularly to our general labourers. No HIV/Aids workplan and the development will be done when we have a dedicated official to assist employees.

Currently Special Projects is working with the Local Aids Council, Department of Social Development and other community-based projects for HIV/AIDS projects.

### 3.2 Description of current land uses

A desktop study conducted based on literature review and maps generated by GIS technician, and the findings of this study shows that the area is covered by natural vegetation. There are no activities detected on the project area by Singo Consulting's GIS technician as indicated in Figure 32. The study also revealed the capability of the project area to be arable (see Figure 32).

During site assessment conducted on the 26<sup>th</sup> of October 2021, it was observed that the project area is covered by the natural environment, and this confirms the data found on the desktop study and the GIS map. The land is however used for livestock grazing, hence cattles were found within the farm grazing.

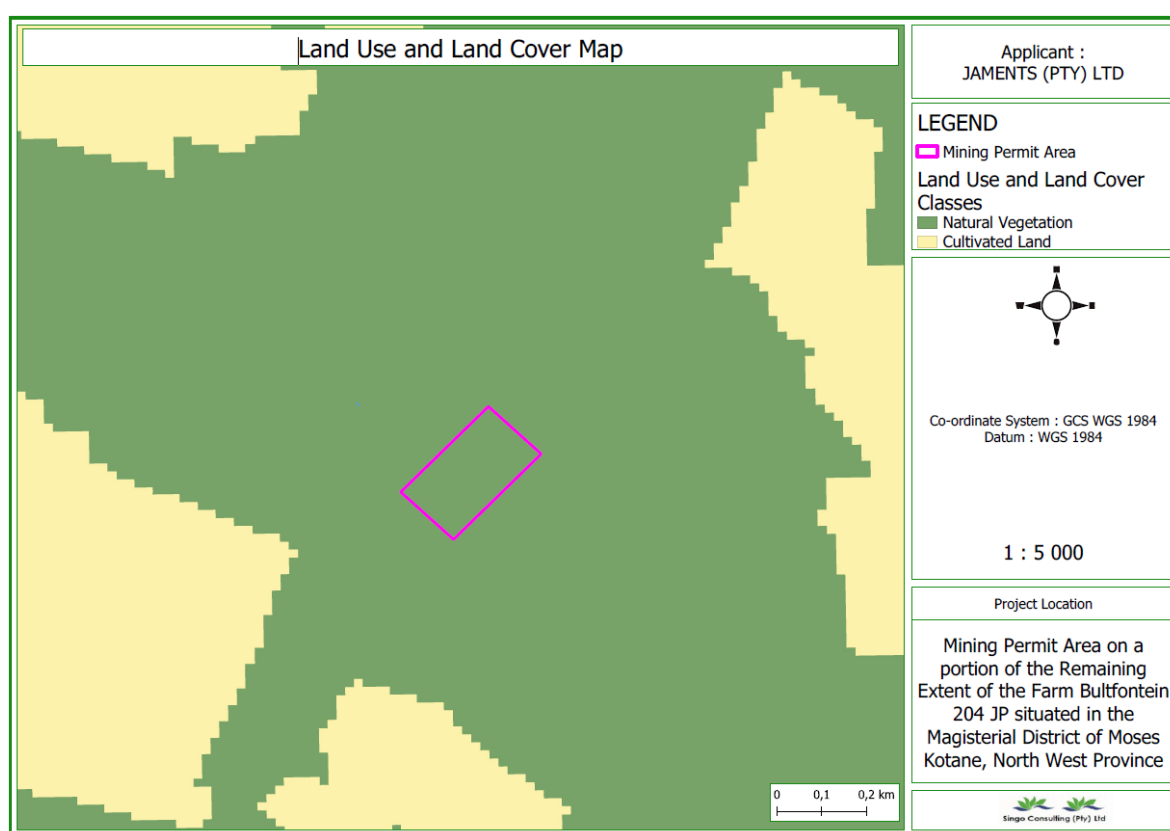


Figure 32: Land use and land cover map.

### 3.3 Description of site-specific environmental features and infrastructure

The following table provides a description of the land uses and/or prominent features that currently occur within a 500 m radius of the site:

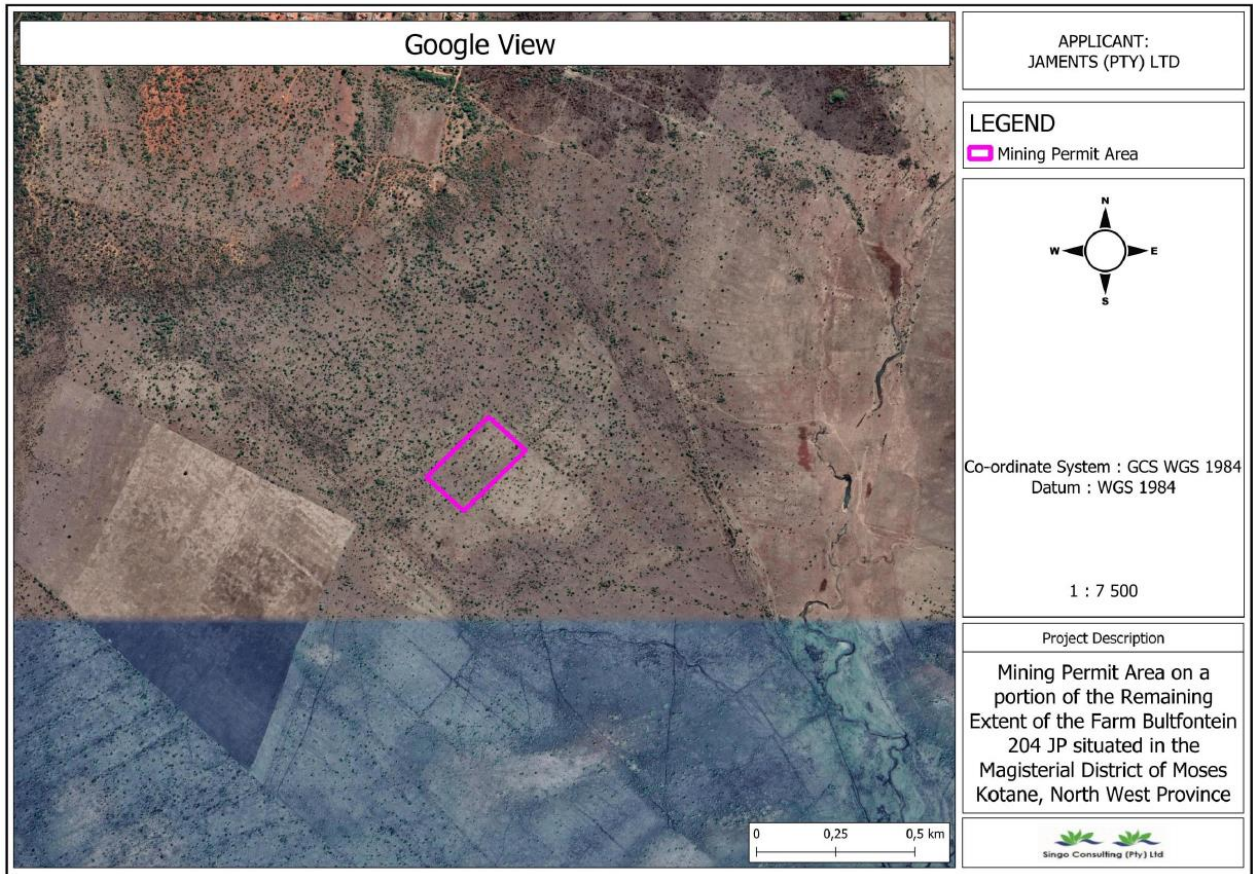
Land use character	Yes	No	Description
Natural area	Yes		The area is still in its natural state, it is however used for livestock grazing
Low-density residential		No	
Medium-density residential		No	
High-density residential		No	

Land use character	Yes	No	Description
Informal residential		No	
Retail commercial and warehousing		No	
Light industrial		No	
Medium industrial		No	
Heavy industrial		No	
Power station		No	
Office/consulting room		No	
Military or police base/ station/compound		No	
Soil heap or slimes dam		No	
Quarry, sand, mine or borrow pit		No	
Dam or reservoir		No	
Hospital/medical centre		No	
School or crèche		No	
School		No	
Tertiary education facility		No	
Church		No	
Old age home		No	
Sewage treatment plant		No	
Train station or shunting yard		No	
Railway line		No	
Major (road 4 lines or more)		No	
River, stream or wetland		No	
Agriculture		No	
Nature conservation area		No	
Mountain, hill or ridge		No	
Museum		No	
Historical building		No	
Plantation		No	
Landfill/waste treatment site		No	
Archaeological sites		No	
Other land uses		No	

The site has not been developed, it is still in its natural state. However, informal settlers constructed houses in the southern portion of the site. This settlement extends onto the adjacent property. A dilapidated hostel and a football field are present next to this area.

The impact of the proposed mining area on the infrastructural features of the surrounding area is considered of low significance, as the impact of the mining activities will be concentrated within the 5 ha footprint area of the mine.

In order to mitigate the potential impact on the watercourse, storm water management will have to be implemented on-site. Storm water will have to be channelled around the mining area to prevent possible contamination of clean water flowing over dirty areas. If this is implemented, the proposed activity is not expected to have a negative effect on the surface water.



**Figure 33: Figure showing nearest town (1:7500) and indicating distance between surrounding infrastructure in relation to the proposed mining area.**

### 3.4 Environmental and current land use map

Show all environmental and current land use features.

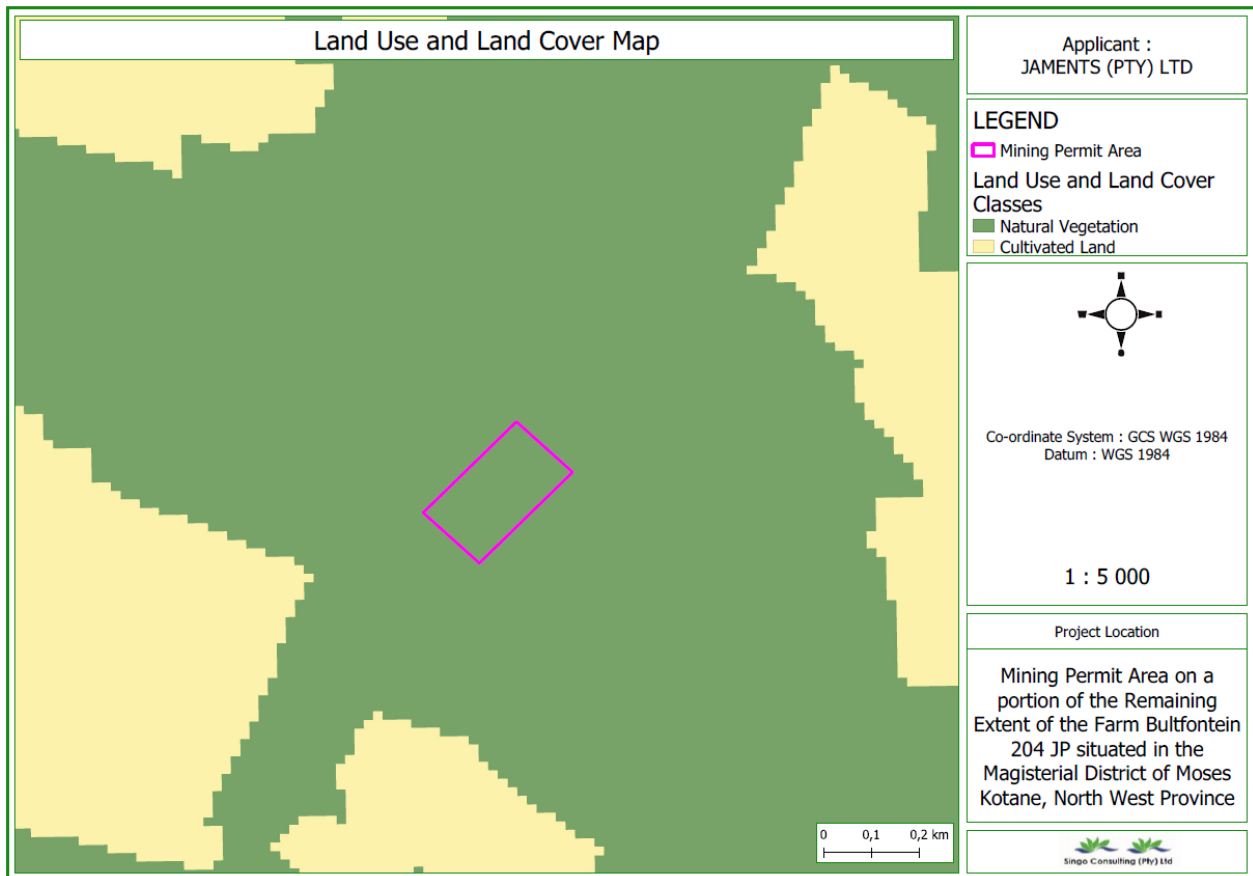


Figure 34: The environmental and current land use map.

### 3.5 Impacts and risks identified, including the nature, significance, consequence, extent, duration and probability of the 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 following potential impacts were identified of each main activity in each phase. The impact rating listed below was determined for each impact prior to bringing the proposed mitigation measures into consideration. The degree of mitigation indicates the possibility of partial, full or no mitigation of the identified impact.

#### 3.5.1 Stripping and stockpiling of topsoil

Visual intrusion associated with the establishment of the mining area

**Rating: Medium-High**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	5	2	3	5	5	5	15

Dust nuisance caused by soil disturbance.

**Rating: Medium**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	4	2	2.6	5	5	5	13

Noise nuisance caused by machinery stripping and stockpiling the topsoil.

**Rating: Medium**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	4	2	2.6	5	5	5	13

Infestation of the topsoil heaps by weeds or invader plants.

**Rating: Low-Medium**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	4	1	2.6	5	2	3.5	9

Loss of topsoil due to incorrect storm water management.

**Rating: Medium**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	4	1	2.6	5	4	4.5	11.7

Contamination of area with hydrocarbons or hazardous waste materials.

**Rating: Medium-High**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
4	4	2	3.3	5	5	5	16.5

### 3.5.2 Excavation

Visual intrusion associated with the excavation activities.

**Rating: Medium-High**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	5	2	3	5	5	5	15

Dust nuisance due to excavation activities.

**Rating: Medium**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	2	2.6	5	5	5	13

Noise nuisance generated by excavation equipment.

**Rating: Medium**

**Degree of mitigation: Partial**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	4	1	2.3	4	5	4.5	10.4

Unsafe working conditions for employees.

**Rating: Medium-High**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
4	4	1	3	5	5	5	15

Negative impact of the fauna and flora of the area.

**Rating: Low**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
2	1	1	1.3	5	1	3	3.9

Contamination of area with hydrocarbons or hazardous waste materials.

**Rating: Medium**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
4	4	2	3.3	4	5	4.5	14.9

Weed and invader plant infestation of the area.

**Rating: Low-Medium**

**Degree of mitigation: Full**

Severity	Duration	Extent	Consequence			Likelihood	Significance
				Probability	Frequency		
3	4	1	2.6	5	2	2	5.2

### 3.5.3 In-pit crushing

Dust nuisance due to the crushing activities.



**Rating: Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	3	2	2.6	5	5	5	13

Noise nuisance generated by the crushing activities.

**Rating: Medium**

**Degree of mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	4	5	4.5	11.7

Contamination of area with hydrocarbons or hazardous waste materials.

**Rating: Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	2	3.3	4	5	4.5	14.9

### 3.5.4 Stockpiling and transporting

Visual intrusion associated with the stockpiled material and vehicles transporting material.

**Rating: Medium**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	4	5	4.5	11.7

Loss of material due to ineffective storm water handling

**Rating: Low-Medium**

**Degree of mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.3	4	3	3.5	8

Weed and invader plant infestation of the area due to the disturbance of the soil

**Rating: Low-Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	4	2	3	7.8

Dust nuisance from stockpiled material and vehicles transporting the material

**Rating: Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	4	5	4.5	11.7

Degradation of access roads

**Rating: Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	2	3	4	5	4.5	13.5

Noise nuisance caused by vehicles

**Rating: Medium**

**Degree of mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	4	5	4.5	11.7

Contamination of area with hydrocarbons or hazardous waste materials

**Rating: Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	2	3.3	4	5	4.5	14.9

### 3.5.5 Sloping and landscaping during rehabilitation

Soil erosion

**Rating: Low-Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	1	3	3	3	3	9

Health and safety risk posed by un-sloped areas

**Rating: Medium-High**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	5	1	3.3	5	5	5	16.5

Dust nuisance caused during sloping and landscaping activities

**Rating: Low-Medium**

**Degree of mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	3	1	2	4	5	4.5	9

Noise nuisance caused by machinery

**Rating: Low-Medium**

**Degree of mitigation: Partial**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	2	1.6	3	5	4	6.4

Contamination of area with hydrocarbons or hazardous waste materials

**Rating: Low-Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	4	1	3	3	1	2	6

### 3.5.6 Replacing of topsoil and rehabilitation of disturbed area

Loss of reinstated topsoil due to the absence of vegetation

**Rating: Low-Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	3	1	2.3	3	2	2.5	5.8

Infestation of the area by weed and invader plants

**Rating: Low-Medium**

**Degree of mitigation: Full**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	4	1	2.6	4	2	3	7.8

## 3.6 Methodology for the assessment of the potential environmental, social and cultural impacts

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.

### 3.6.1 Definitions and concepts

#### 3.6.1.1 Environmental significance

The concept of significance is at the core of impact identification, evaluation and decision making. The concept remains largely undefined and there is no international consensus on a single definition. The following common elements are recognised from the various interpretations:

- Environmental significance is a value judgement.
- The degree of environmental significance depends on the nature of the impact.

- The importance is rated in terms of both biophysical and socio-economic values.
- Determining significance involves the amount of change to the environment perceived to be acceptable to affected communities.

Significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of acceptability) (DEAT (2002) Impact Significance, Integrated Environmental Management, Information Series 5).

The concept of risk has two dimensions, namely the consequence of an event or set of circumstances, and the likelihood of particular consequences being realised (Environment Australia (1999) Environmental Risk Management).

### **3.6.1.2 Impact**

The positive or negative effects on human well-being and/or the environment.

### **3.6.1.3 Consequence**

The intermediate or final outcome of an event or situation, or the result on the environment of an event.

### **3.6.1.4 Likelihood**

A qualitative term covering both probability and frequency.

### **3.6.1.5 Frequency**

The number of occurrences of a defined event in a given time or rate.

### **3.6.1.6 Probability**

The likelihood of a specific outcome measured by the ratio of a specific outcome to the total number of possible outcomes.

### **3.6.1.7 Environment**

Surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelation (ISO 14004, 1996).

### **3.6.1.8 Methodology that will be used**

The environmental significance assessment methodology is based on the following determination:

**ENVIRONMENTAL SIGNIFICANCE = OVERALL CONSEQUENCE X OVERALL LIKELIHOOD**

### **Determination of overall consequence**

Consequence analysis is a mixture of quantitative and qualitative information; the outcome can be positive or negative. Several factors determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: **Severity/Intensity, Duration and Extent/Spatial Scale**. Each factor is assigned a rating of 1 to 5, as described in the following tables.

### Determination of severity/intensity

**Severity** relates to the nature of the event, aspect or impact on the environment and describes how severe the aspects impact the biophysical and socio-economic environment. The following section indicates the overall rating for severity, taking into consideration the various criteria.

#### 3.6.1.9 Severity rating

Type of criteria	Rating				
	1	2	3	4	5
Quantitative	0-20%	21-40%	41-60%	61-80%	81-100%
Qualitative	Insignificant/ No harmful	Small / Potentially harmful	Significant/ harmful	Great/very harmful	Disastrous, extremely harmful
Social/ community response	Acceptable/ I&AP satisfied	Slightly tolerable / Possible objections	Intolerable/ sporadic complaints	Unacceptable/ widespread complaints	Totally unacceptable/ possible legal action
Irreversibility	Very low cost to mitigate/ High potential to mitigate impacts to level of insignificance/ easily reversible	Low cost to mitigate	Substantial cost to mitigate/ potential to mitigate impacts/ potential to reverse impact	High cost to mitigate	Prohibitive cost to mitigate/ Little or no mechanism to mitigate impact Irreversible
Biophysical (air quality, water quantity and quality, waste production, fauna and flora)	Insignificant change/ deterioration or disturbance	Moderate change/ deterioration or disturbance	Significant change/ deterioration or disturbance	Very significant change/ deterioration or disturbance	Disastrous change/ deterioration or disturbance

### Determination of duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place.

#### Rating of duration

Rating	Description
1	Up to 1 month



2	1-3 months (quarter)
3	3-12 months
4	1-10 years
5	Beyond 10 years

**Determination of extent/spatial scale**

Extent or spatial scale is the area affected by the event, aspect or impact.

### Rating of extent/spatial scale

Rating	Description
1	Immediate, fully contained area
2	Surrounding area
3	Within business unit area of responsibility
4	Within the farm/neighboring farm area
5	Regional, national, international

### Determination of overall consequence

Overall consequence is determined by adding the factors determined above and summarised below and dividing the sum by 3.

### Example of calculating overall consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
<b>Subtotal</b>	<b>10</b>
<b>Total consequence (subtotal divided by 3)</b>	<b>3.3</b>

### DETERMINATION OF LIKELIHOOD

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described in the following.

### Determination of frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken.

### Rating of frequency

Rating	Description
1	Once a year or once/more during operation
2	Once/more in 6 months
3	Once/more a month
4	Once/more a week
5	Daily

### Determination of probability

Probability refers to how often the activity or aspect has an impact on the environment.

### Rating of probability

Rating	Description
1	Almost never/almost impossible
2	Very seldom/highly unlikely
3	Infrequent/unlikely/seldom
4	Often/regularly/likely/possible
5	Daily/highly likely/definitely

## Overall likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and dividing the sum by 2.

### Example of calculating overall Likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
<b>Subtotal</b>	<b>6</b>
<b>Total likelihood (subtotal divided by 2)</b>	<b>3</b>

### 3.6.2 Determination of overall environmental significance

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will fall into a range of low, low-medium, medium, medium-high or high, as shown in the table below.

#### 3.6.2.1 Determination of overall environmental significance

Significance or risk	Low	Low-medium	Medium	Medium-high	High
Overall consequence X overall likelihood	1-4.9	5-9.9	10-14.9	15-19.9	20-25

#### 3.6.2.2 Qualitative description or magnitude of environmental significance

Significance or risk	Low	Low-medium	Medium	Medium-high	High
Impact magnitude	Impact is of very low order and therefore likely to have very little real effect. Acceptable.	Impact is of low order and therefore likely to have little real effect. Acceptable.	Impact is real, and potentially substantial in relation to other impacts. Can pose a risk to company.	Impact is real and substantial in relation to other impacts. Pose a risk to the company. Unacceptable.	Impact is of the highest order possible. Unacceptable. Fatal flaw.
Action required	Maintain current management measures. Where possible improve.	Maintain current management measures. Implement monitoring and evaluate to determine potential increase in risk. Where possible improve.	Implement monitoring. Investigate mitigation measures and improve management measures to reduce risk, where possible.	Improve management measures to reduce risk.	Implement significant mitigation measures or implement alternatives.

This description is qualitative and an indication of the nature or magnitude environmental significance. It guides the prioritisations and decision-making process

associated with this event, aspect or impact.

### 3.6.3 Description of environmental significance and related action required

Based on the above, the significance rating scale has been determined as follows:

High	Of the highest order possible within the bounds of impacts which could occur. In the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which it was predicted. In the case of positive impacts, there is no real alternative to achieving the benefit.
Medium-high	Impacts of a substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts, other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
Medium	Impact would be real but not substantial within the bounds of those, which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In case of positive impacts, other means of achieving these benefits would be about equal in time, cost and effort.
Low-medium	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required, or both. In case of positive impacts alternative means for achieving this benefit would likely be easier, cheaper, more effective, less time-consuming, or some combination of these.
Low impact would be negligible	In the case of negative impacts, almost no mitigation and or remedial activity would be needed, and any minor steps, which might be needed, would be easy, cheap and simple. In the case of positive impacts, alternative means would almost all likely be better, in one or a number of ways, than this means of achieving the benefit.
Insignificant	There would be a no impact at all – not even a very low impact on the system or any of its parts.

### **3.7 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.

The proposed PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore mine will be established on a rehabilitate open cast ground with minimal vegetation cover. The adjacent land hosts the Highveld Steel industry and some parts are being utilised for agricultural purposes. Upon closure of the mining area, the land will, once again, be used for agricultural purposes.

Due to the distance from residential area to the mine, little to no significantly negative impacts on the community could be identified. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document are not implemented and managed on-site. The operation of the mine will, however, also have a number of positive impacts, such as permanent job creation for skilled, semi-skilled and un-skilled workers. The proposed mine will, therefore, contribute to upgrading/ maintaining infrastructure in and around Bapong area, which will indirectly contribute to the economy of the area.

### **3.8 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 mitigation 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.

#### **3.8.1 Visual mitigation**

The risk of the proposed mining activities having a negative impact on the aesthetic quality of the surrounding environment can be reduced to medium risk through the implementation of the following mitigation measures:

- The site must be kept neat and in good condition at all times.
- Upon closure, the site must be rehabilitated and sloped to ensure that the visual impact on the aesthetic value of the area is minimal.

### **3.8.2 Dust handling**

The risk of dust generated from the proposed mining activities having a negative impact on the surrounding environment can be reduced to low-medium through the implementation of the following mitigation measures:

- Dust liberation into the surrounding environment must be effectively controlled using *inter alia*, water spraying and/or other dust-allaying agents.
- The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness in addressing dust suppression.
- Access road speeds must be limited to 40km/h to prevent excessive dust generation.
- Roads must be sprayed with water or an environmentally friendly dust allaying agent, that contains no Polychlorinated Biphenyl (PCBs) (e.g. DAS products), if dust is generated above acceptable limits.
- The in-pit crusher plant must have operational water sprayers to alleviate dust generation from the conveyor belts.

### **3.8.3 Noise handling**

The risk of noise, generated from the proposed mining activities, having a negative impact on the surrounding environment can be reduced to low-medium through the implementation of the following mitigation measures:

- The applicant must ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.
- No loud music may be permitted at the mining area.
- All mining vehicles must be equipped with silencers and kept roadworthy in terms of the Road Transport Act.

### **3.8.4 Management of weed or invader plants**

The risk of weeds or invader plants invading the disturbed area can be reduced to low through the implementation of the following mitigation measures:

- A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of Conservation of Agricultural Act (Act No 43 1983).
- Management must take responsibility to control declared invader or exotic

species on the rehabilitated areas. The following control methods can be used:

- The plants can be uprooted, felled or cut off and destroyed completely.
- The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide.
- The temporary topsoil stockpiles must be kept free of weeds.

### **3.8.5 Storm water handling**

The risk of contamination through dirty storm water escaping from work areas, or erosion or loss of material caused by uncontrolled storm water flowing through the mining area, can be reduced to low by implementing the following mitigation measures:

- Storm water must be diverted around the topsoil heaps, stockpile areas and access roads to prevent erosion and loss of material.
- Runoff water must also be diverted around the stockpile areas with trenches and contour structures to prevent erosion of the work areas.
- Mining must be conducted in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions the DWS may impose:
  - Clean water (e.g. rainwater) must be kept clean and routed to a natural watercourse by a system separate from the dirty water system. Clean water must be prevented from running or spilling into dirty water systems.
  - Dirty water must be collected and contained in a system separate from the clean water system.
  - Dirty water must be prevented from spilling/seeping into clean water systems.
  - The storm water management plan must apply for the entire life cycle of the mine and over different hydrological cycles (rainfall patterns).
  - The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.

### **3.8.6 Management of health and safety risks**

The health and safety risk posed by the proposed mining activities can be reduced to



low through the implementation of the following mitigation measures:

- Measures to limit fly rock must be taken.
- Audible warning of a pending blast must be given at least 3 minutes before the blast.
- All fly rock (with diameters of 150 mm and larger) which falls beyond the working area, together with the rock spill, must be collected and removed,
- Workers must have access to the correct PPE, as required by law.
- All operations must comply with the Occupational Health and Safety Act (OHSA).

### **3.8.7 Waste management**

The risk of waste generation having a negative impact on the surrounding environment can be reduced to low through by implementing the following mitigation measures:

- No processing area or waste pile may be established within 100 m of the edge of any river channel or other water bodies.
- Regular vehicle maintenance may only take place within the service bay area of the off-site workshop. If emergency repairs are needed on equipment unable to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 L closed container/bin to be removed from the emergency service area to the workshop to ensure proper disposal.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognised facility.
- Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage and the polluted soil and disposing of it at a recognised facility. Proof hereof should be filed.
- Suitable covered receptacles should be available always and conveniently placed for waste disposal.
- Non-biodegradable refuse, such as glass bottles, plastic bags, metal scrap, etc., should be stored in a container with a closable lid at a collecting point, collected on a regular basis and disposed of at a recognised landfill site. Specific precautions should be taken to prevent refuse from being dumped on or near the mine area.
- Biodegradable refuse generated should be handled as indicated above.

### **3.8.8 Management of access roads**

The risk on the condition of the roads, as a result of the proposed mining activities, can be reduced to low-medium by implementing the following mitigation measures:

- Storm water must be diverted around the access roads to prevent erosion.
- Erosion of access road: Vehicular movement must be restricted to existing access routes to prevent criss-crossing of tracks through undisturbed areas. Rutting and erosion of the access road as a result of the mining activities should be repaired by the applicant.

### **3.8.9 Topsoil handling**

The risk of topsoil loss can be reduced to low by implementing the following mitigation measures:

- Where applicable, the first 300 mm of topsoil should be removed in strips and stored along the boundary of the mining area. Stockpiling of topsoil must be done to protect it from erosion, which includes mixing it with overburden or other material. The topsoil must be used to cover the rehabilitated area and improve the establishment of natural vegetation.
- The temporary topsoil stockpiles of each removed strip must be kept weed free.
- Topsoil stockpiles must be placed on a levelled area and measures should be implemented to safeguard the piles from being washed away in the event of heavy rain/storm water.
- Topsoil heaps should not exceed 1.5 m, to preserve micro-organisms in the topsoil, which can be lost due to compaction and lack of oxygen.
- Should natural vegetation not establish on the heaps within 6 months of stockpiling, it must be planted with an indigenous grass species.
- Storm and runoff water should be diverted around the stockpile area and access roads to prevent erosion.

### **3.8.10 Protection of fauna and flora**

The risk on the fauna and flora of the footprint area, as well as the surrounding environment, as a result of the proposed mining activities, can be reduced to low by implementing the following mitigation measures:

- The site manager must ensure that no fauna is caught, killed, harmed, sold or

played with.

- Workers must be instructed to report any animals that may be trapped in the working area.
- No snares may be set or nests raided for eggs or young.
- No plants or trees may be removed without the approval of the Environmental Control Officer (ECO).

### **3.9 Motivation where no alternative sites were considered**

Jaments (Pty) Ltd identified the growing need for PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore resources due to an increase in power demand. In this light, the applicant identified the proposed area as the preferred and only viable site alternative because of its immediate availability backed by data reviewed in the PWP, which has proven that PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore resources are available in the area. The establishment of a PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit in this un-utilised area was found to be most viable.

Various project alternatives were considered during the planning phase of the project and the preferred alternatives proved to be:

- The open cast mining of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore has been identified as the most effective method to produce the desired PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore product.
- The use of temporary infrastructure will reduce the impact on the environment and decrease closure objectives with regard to infrastructure decommissioning.
- It is recommended that the existing farm road connected to the provincial road to the north-west of the property be used as an access road.

### **3.10 Statement motivating the alternative development location within overall site**

Provide a statement motivating the final site layout that is proposed.

The open cast mining of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore has been identified as the most cost-effective method to produce the desired PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore product. The proposed method will produce any residual (overburden) waste to be disposed of.

Due to the remote location of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit, the potential impacts on the surrounding environment, associated with open cast mining, is considered of low significance. It is proposed that all mining-related infrastructure will be contained within the boundaries of the mining area. As no permanent infrastructure will be established on site, the layout/position of the temporary infrastructure will be determined by the mining progress and available space in the 5 ha mining area.

### **3.11 Process undertaken to identify, assess and rank impacts and risk of site activities**

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.

During the impact assessment process, several potential impacts were identified of each main activity in each phase (3.12). An initial significance rating was determined for each potential impact, should the mitigation measures proposed in this document not be implemented on-site. The impact assessment process continued to identify mitigation measures to address the impact that the proposed mining activity may have on the surrounding environment. A significance rating was again determined for each impact using a relevant methodology. The impact ratings listed in the following section was determined for each impact after bringing the proposed mitigation measures into consideration and therefore represents the final layout/activity proposal.

### 3.11.1 Stripping and stockpiling of topsoil

Visual intrusion associated with the establishment of the mining area.

**Rating: Medium**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	4	2	2.6	5	5	5	13

Dust nuisance caused by the disturbance of the soil

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
1	1	1	1	3	2	2.5	2.5

Noise nuisance caused by machinery stripping and stockpiling the topsoil

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
1	1	2	1.3	3	2	2.5	3.3

Infestation of the topsoil heaps by weeds or invader plants

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	1	1	1.6	3	2	2.5	4

Loss of topsoil due to incorrect storm water management

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
3	1	1	1.6	3	2	2.5	4

Contamination of area with hydrocarbons or hazardous waste materials

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
4	1	1	3	2	1	1.5	4.5

### 3.11.2 Excavation

Visual intrusion associated with the excavation activities

**Rating: Medium**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
2	4	2	2.6	5	5	5	13

Dust nuisance due to excavation activities

**Rating: Low**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
1	1	1	1	3	3	3	3

Noise nuisance generated by excavation equipment

**Rating: Low – Medium**

Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
1	4	1	2	3	3	3	6

Unsafe working conditions for employees

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

Negative impact on the fauna and flora of the area

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	1	1.3	1	1	1	1.3

Contamination of area with hydrocarbons or hazardous waste materials

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	3	1	2	4

Weed and invader plant infestation of the area

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	2	2	3.2

**3.11.3 Crushing**

Dust nuisance due to the crushing activities

**Rating: Low – Medium**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	3	1	2	2	3	2.5	5

Noise nuisance generated by the crushing activities

**Rating: Low – Medium**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	1	2.3	2	3	2.5	5.8

Contamination of area with hydrocarbons or hazardous waste materials



**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	2	2	4

**3.11.4 Stockpiling and transporting**

Visual intrusion associated with the stockpiled material and vehicles transporting the material.

**Rating: Low – Medium**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	4	2	2.6	2	3	2.5	6.5

Loss of material due to ineffective storm water handling.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	1	1.3	2	1	1.5	2

Weed and invader plant infestation of the area due to the disturbance of the soil.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	1	1.3	4	2	3	3.9

Dust nuisance from stockpiled material and vehicles transporting the material.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	1	1	1	2	3	2.5	2.5

Degradation of access roads.

**Rating: Low – Medium**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	2	2	3	3	3	6

Noise nuisance caused by vehicles.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	1	2	1.3	2	3	2.5	3.3

Contamination of area with hydrocarbons or hazardous waste materials.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	2	2	4

**3.11.5 Sloping and landscaping during rehabilitation**

Soil erosion

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

Health and safety risk posed by un-sloped areas.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

Dust nuisance caused during sloping and landscaping activities.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
1	1	1	1	2	1	1.5	1.5

Noise nuisance caused by machinery.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
2	1	2	1.6	2	1	1.5	2.4

Contamination of area with hydrocarbons or hazardous waste materials.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
4	1	1	2	2	1	1.5	3

**3.11.6 Replacing of topsoil and rehabilitation of disturbed area**

Loss of reinstated topsoil due to the absence of vegetation.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	3	2	2.5	4

Infestation of the area by weed and invader plants.

**Rating: Low**

			Consequence			Likelihood	Significance
Severity	Duration	Extent		Probability	Frequency		
3	1	1	1.6	2	2	2	3.2

### 3.12 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 I&APs).

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
E.g. for prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office and access route. E.g. for mining - excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams, boreholes, accommodation, offices, ablution, stores workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.	Including the potential impacts for cumulative impacts, e.g. dust, noise, drainage, surface disturbance, fly rock and surface water contamination, groundwater contamination, and air pollution.		In which impact is anticipated, e.g. construction, commissioning, operational decommissioning, closure, post-closure.	if not mitigated	Modify, remedy, control, or stop through, e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation and alternative activity. Modify through alternative method. Control through noise control. Control through management and monitoring through rehabilitation.	if mitigated
<b>Stripping and stockpiling of topsoil</b>	Visual intrusion associated with the establishment of the mining area	The visual impact may affect the residents of the immediate area.	Site establishment /construction phase	Medium – High	Control: Implementation of proper housekeeping	Medium
	Dust nuisance caused by the disturbance of soil	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Medium	Control: Dust suppression	Low
	Noise nuisance caused by machinery stripping and stockpiling the topsoil	The noise impact should be contained within the boundaries of the property but might have a periodic impact on the closest residents of the Bapong community.		Medium	Control: Noise control measures	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Infestation of the topsoil heaps by weeds and invader plants	Biodiversity		Low-medium	Control and remedy: Implementation of weed control	Low
	Loss of topsoil due to incorrect storm water management	Loss of topsoil will affect the rehabilitation of the mining area.		Medium	Control: Storm water management	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water contamination if not addressed		Medium-high	Control and remedy: Implementation of waste management	Low
<b>Blasting</b>	Health and safety risk posed by blasting activities	Impact might affect the employees working on site	Operational phase	Medium	Control: Health and safety monitoring and management	Low
	Dust nuisance caused by blasting activities	Depends on the blast, the impact might affect the surrounding community. Blasting will occur twice a year.		Low-medium	Control: Dust suppression	Low-medium
	Noise nuisance caused by blasting activities	Dependent on the blast, the impact might affect the surrounding community. Blasting will occur twice a year.		Low-medium	Control: Noise control measures	Low
<b>Excavation</b>	Visual intrusion associated with the excavation activities	The visual impact may affect the residents of the immediate area.	Operational phase	Medium-high	Control: Implementation of proper housekeeping	Medium
	Dust nuisance due to excavation activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Medium	Control: Dust suppression	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	Noise nuisance generated by excavation equipment	The noise impact should be contained within the boundaries of the property but might have a periodic impact on the closest residents of the Bapong Community.		Medium-high	Control: Noise control measures	Low
	Unsafe working conditions for employees	Impact might affect employees.		Low	Control: Health and safety monitoring and management	Low
	Negative impact on the fauna and flora of the area	Biodiversity		Medium	Control: Protection of fauna and flora through operational phase	Low
	Contamination of area with hydrocarbons or hazardous waste materials	Contamination may cause surface or ground water contamination if not addressed.		Medium	Control: Implementation of waste management	Low
	Weed and invader plant infestation	Biodiversity		Low-medium	Control: Implementation of weed control	Low
<b>Crushing</b>	Dust nuisance due to the crushing activities	Dust will be contained in property boundaries and therefore affect only the landowner.	Operational phase	Medium	Control: Dust suppression	Low-medium
	Noise nuisance generated by the crushing activities	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong Community.		Medium	Control: Noise control measures	Low-medium
	Contamination of area with hydrocarbons or	Contamination may cause surface or ground water contamination if		Medium	Control: Implementation of waste management	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
	hazardous waste materials	not addressed				
<b>Stockpiling and transporting</b>	Visual intrusion associated with the stockpiled material and vehicles transporting the material	The visual impact may affect the residents of the immediate area.	Operational phase	Medium	Control: Implementation of proper housekeeping	Low-medium
	Loss of material due to ineffective storm water handling	Impact will affect income of applicant.		Low-medium	Control: Storm water control measures	Low
	Weed and invader plant infestation of the area due to soil disturbance	Biodiversity		Low-medium	Control and remedy: Implementation of weed control	Low
	Dust nuisance from stockpiled material and vehicles transporting the material	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Medium	Control: Dust suppression	Low
	Degradation of access roads	All road users will be affected.		Medium	Control and remedy: Road management	Low-medium
	Noise nuisance caused by vehicles	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong Community.		Medium	Control: Noise management monitoring and management	Low
	Contamination of area with hydrocarbons or hazardous waste	Contamination may cause surface or ground water contamination if not addressed		Medium	Control: Implementation of waste management	Low
<b>Sloping and landscaping</b>	Soil erosion	Biodiversity	Decommissionin	Low-medium	Control: Soil management	Low



NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
<b>during rehabilitation</b>	Health and safety risk posed by un-sloped areas	Impact will affect the employees and residents of the property	g phase	Medium-high	Control: Health and safety monitoring and management	Low
	Dust nuisance caused during sloping and landscaping	Dust will be contained within the property boundaries and will therefore affect only the landowner		Low-medium	Control: Dust suppression	Low
	Noise nuisance caused by machinery	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong Community.		Low-medium	Control: Noise monitoring	Low
	Contamination of area with hydrocarbons or hazardous waste	Contamination may cause surface/ground water contamination if not addressed		Low-medium	Control: Waste management	Low
<b>Replacing of topsoil and rehabilitation of disturbed area</b>	Loss of reinstated topsoil due to the absence of vegetation	Biodiversity and soil management	Decommissioning phase	Low-medium	Control: Soil management	Low
	Infestation of the area by weed and invader plants	Biodiversity and soil management		Low-medium	Control and remedy: Implementation of weed control	Low

The supporting impact assessment conducted by the EAP must be attached as an appendix.

### 3.13 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.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report Mark with an X where applicable	Reference to applicable report section Where specialist recommendations have been included
<b>Hydrogeological study was deemed necessary for this project as the project</b>			
Hydrogeological	<ul style="list-style-type: none"> <li>❖ Groundwater quality should be monitored quarterly to see if there are changes in terms of quality due to mining activity that will be going on.</li> <li>❖ All boreholes should be surveyed to determine actual collar heights in meters above mean sea level. All groundwater levels and groundwater contours should then be reported in terms of groundwater elevations, making for a much more accurate presentation of groundwater levels and flow patterns.</li> <li>❖ After closure groundwater level and quality should be monitored in order to see rehabilitation is introducing any good improvements to the groundwater. This should be considered only if the mining activity had negative impact on the groundwater.</li> <li>❖ Since there is a wetland close to the proposed mining vicinity there is a need to put berms to prevent the stormwater flowing into the wetland, which can result to contamination of water on the wetland area.</li> </ul>	<b>X</b>	Section 1 (a): Type of environment affected by the proposed activity (i.e. Surface and Ground water)
Surface Water Study	<p>The study entails the surface water assessment of the sub-quaternary catchment and its rivers and tributaries as it relates to the opencast PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore mining by Jaments (Pty) Ltd on portion of the remaining extent of the farm Bultfontein 204 JP.</p> <p>Although a wetland was identified on the property the project area is not located within an area classified as a national priority area for wetlands. In terms of the overall conservation of aquatic biodiversity of the area, the project should aim to minimize impacts on the aquatic resource in order to maintain its current basic ecosystem functions.</p> <p>and all legislation and mitigation is followed and adhered to, all impacts are considered to be low to moderate and manageable.</p>	<b>X</b>	Section 1 (a): Type of environment affected by the proposed activity (i.e. Surface and Ground water)

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report Mark with an X where applicable	Reference to applicable report section Where specialist recommendations have been included
	Within the limits of the present knowledge of the area, there are no self-evident impacts in terms of the surface water resource that can reasonably be considered to represent a fatal flaw.		
Wetland Study	<p>The following recommendations should be considered during the mining operation to further limit the potential of impacting the identified riparian systems:</p> <ul style="list-style-type: none"> <li>▪ A layout plan must be compiled indicating the limits of disturbance associated with the proposed mining activities in relation to the identified sensitive areas (i.e. riparian system).</li> <li>▪ A detailed stream flow management plan must be developed indicating how the water will be diverted from current mining workings and how ponding will be prevented.</li> <li>▪ Where feasibly possible, mining activities should be limited to the drier months of the year.</li> <li>▪ An alien invasive management plan must be compiled and implemented to prevent encroachment of alien plant species into the delineated wetland areas.</li> <li>▪ A Work Method Statement must be compiled by the client and/or responsible contractor and should include aspects such as: <ul style="list-style-type: none"> <li>✓ Proposed construction works and methodology;</li> <li>✓ Materials and equipment to be utilised;</li> </ul> </li> </ul> <p>▪ Method and location of storage of material (this would be required to be indicated on a site plan) and located outside the 1:100 floodline; ✓ Procedures for containment of leaks/spills as well as associated</p> <ul style="list-style-type: none"> <li>✓ Waste management; and</li> <li>✓ Roles and responsibilities of key personnel (e.g. project manager, contractor/site manager, ECO).</li> </ul> <p>Emergency Response Plan/Spill Contingency Plan;</p> <ul style="list-style-type: none"> <li>▪ A watercourse/ river bed rehabilitation plan must be developed and approved by the Competent Authority before mining activities can be undertaken.</li> </ul>	<b>X</b>	Section 1 (a): Type of environment affected by the proposed activity (i.e. Surface and Ground water)

### **3.14 Environmental impact statement**

#### **3.14.1 Summary of the key findings of the EIA**

The key findings of the EIA are as follows:

- The project entails the establishment of a PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit on previously mined rehabilitated area, with minimal vegetation cover. Therefore, very little natural vegetation has to be disturbed by mining activities.
- A new road will be extended from the existing one to gain access to the mining area.
- The applicant's off-site workshop will be used for servicing vehicles, thereby reducing the risk of hazardous spills and contamination at the mining site.
- Due to the remote setting of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit, most potential impacts can be contained within the boundaries, provided that mitigation measures proposed in this document is implemented on-site.
- The mining operation will have a temporary visual impact on the surrounding environment. Upon closure of the proposed mining area the visual impact on the proposed mining area will be mitigated and addressed.
- Proper storm water and waste management, must be implemented on the site in order to minimise the potential of pollution.

#### **3.14.2 Final site map**

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

The map indicating site activities is attached as APPENDIX 3.

#### **3.14.3 Positive and negative impacts of the proposed activity and alternatives**

The positive impacts associated with the project include:

- Job creation, although a fixed number of jobs to be created cannot be stated at this stage, will include multiple job opportunities for skilled, semi-skilled and unskilled personnel will be created by this project. This will contribute to the socio-economic status of the Bapong 2 village.

- The PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore to be mined will be supplied to metal industries.

The negative impacts associated with the project and that was considered to be of Low-Medium or Medium significance includes:

Visual intrusion associated with the establishment of the mining area	Medium
Visual intrusion associated with the excavation activities	Medium
Visual intrusion associated with the stockpiled material and vehicles transporting the material	Low-medium
Dust nuisance caused by blasting activities	Low-medium
Dust nuisance due to the crushing activities	Low-medium
Noise nuisance generated by excavation equipment	Low-medium
Noise nuisance generated by the crushing activities	Low-medium
Degradation of access roads	Low-medium

### 3.15 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

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

Management objectives	Role	Management outcomes
Dust handling	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Control dust liberation into the surrounding environment by using water spraying and/or other dust allaying agents.</li> <li>• Limit speed on the access roads to 40km/h to prevent the generation of excess dust.</li> <li>• Spray roads with water or an environmentally friendly dust-allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits.</li> <li>• Assess effectiveness of dust suppression equipment.</li> <li>• Ensure the crusher plant has operational water sprayer to alleviate dust generation from the conveyor belts.</li> </ul>
Noise handling	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Ensure that employees and staff conduct themselves in an acceptable manner while on site.</li> <li>• No loud music may be permitted at the mining area.</li> <li>• Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.</li> </ul>
Management of weed/ invader plants	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Implement a weed and invader plant control management plan.</li> <li>• Control declared invader or exotic species on the rehabilitated areas.</li> <li>• Keep the temporary topsoil stockpiles free of weeds.</li> </ul>
Surface and storm water handling	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control	<ul style="list-style-type: none"> <li>• Divert storm water around topsoil heaps, stockpile areas and access roads to prevent erosion and material loss.</li> <li>• Divert runoff water around stockpile areas with trenches and contour structures to prevent erosion of work areas.</li> <li>• Conduct mining in accordance with the Best Practice</li> </ul>

Management objectives	Role	Management outcomes
	Officer.	Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water and Sanitation (DWS), and any other conditions which that Department may impose.
Management of health and safety risks	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• procedures with due cognizance of other land users and structures in the vicinity.</li> <li>• Give audible warning of a pending blast at least 3 minutes in advance of the blast.</li> <li>• Remove all fly rock (of diameter 150 mm and larger) which falls beyond the working area, with the rock spill.</li> <li>• Ensure that workers have access to the correct PPE as required by law.</li> <li>• Ensure all operations comply with the Occupational Health and Safety Act.</li> </ul>
Waste management	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Ensure no waste pile is established within 100 m of the edge of any river channel or other water bodies.</li> <li>• Ensure regular vehicle maintenance take place within the service bay area of the off-site workshop. If emergency repairs are needed on site, ensure drip trays is present. Ensure all waste products are disposed of in a 200 l closed container/bin inside the emergency service area.</li> <li>• Collect effluents containing oil, grease or other industrial substances in a suitable receptacle and remove from site, for resale or appropriate disposal at a recognised facility.</li> <li>• Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage and polluted soil and disposing thereof at a recognised facility. File proof.</li> <li>• Ensure availability of suitable covered, conveniently placed receptacles at all times for waste disposal.</li> <li>• Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognised landfill site at Bapong . Prevent refuse from being dumped on or in the vicinity of the mine area.</li> <li>• Biodegradable refuse to be handled as indicated above.</li> </ul>
Management of access roads	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Divert storm water around access roads to prevent erosion.</li> <li>• Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas.</li> </ul>
Topsoil handling	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Remove the first 300mm of topsoil in strips and store at stockpile area.</li> <li>• Keep the temporary topsoil stockpiles free of weeds.</li> <li>• Place topsoil stockpiles on a levelled area and implement measures to safeguard the piles from being washed away in the event of heavy rains/storm water.</li> <li>• Topsoil heaps should not exceed 1.5 m in order to preserve</li> </ul>



Management objectives	Role	Management outcomes
		<p>micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.</p> <ul style="list-style-type: none"> <li>• Seed the stockpiled topsoil heaps if vegetation does not re-establish within 6 months of stockpiling.</li> <li>• Divert storm- and runoff water around the stockpile area and access roads to prevent erosion.</li> </ul>
Fauna and flora	Site Manager to ensure compliance with EMP guidelines. Compliance to be monitored by the Environmental Control Officer.	<ul style="list-style-type: none"> <li>• Ensure no fauna is caught, killed, harmed, sold or played with.</li> <li>• Instruct workers to report any animals that may be trapped in the working area. Ensure no snares are set or nests raided for eggs or young.</li> <li>• Do not remove plants/trees without ECO approval.</li> </ul>

### 3.16 Aspects for inclusion as conditions of authorisation

Any aspects which must be made conditions of the Environmental Authorisation.

The management objectives listed in this report (4.4) should be considered for inclusion in the environmental authorisation.

### 3.17 Description of any assumptions, uncertainties and gaps in knowledge

Which relate to the assessment and mitigation measures proposed.

The assumptions made in this document, which relate to the assessment and mitigation measures proposed, stem from site-specific information gathered from the property owner, as well as site inspections and background information gathering.

### 3.18 Reasoned opinion as to whether the proposed activity should be authorised

No fatal flaws could be identified that were deemed severe enough to prevent the activity from continuing, should the mitigation measures and monitoring programmes proposed in this document be implemented on site. The management objectives listed in this report should be considered for inclusion in the Environmental Authorisation.

### 3.19 Period for which the Environmental Authorisation is required

The applicant requests the Environmental Authorisation to be valid for a three-year period.

### 3.20 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 the Basic Assessment Report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end

of the EMP and is applicable to the Basic Assessment Report and the Environmental Management Programme report.


### 3.21 Financial provision

State the amount required to manage and rehabilitate the environment.

#### 3.21.1 Explain how the aforesaid amount was derived

The annual amount required to manage and rehabilitate the environment was estimated to be R1 092 338.00. Please see the explanation as to how this amount was derived from the quantum calculator.

**Table 4: Financial quantum**

CALCULATION OF THE QUANTUM							
Applicant: Evaluator:		 <b>JAMENTS</b> <small>HOME OF THE FUTURE</small> <b>Khumbelo Makhado</b>		Ref No.:		DMRE REF: NW /30/5/1/1/3/ (10956) MP	
				Date:		Nov-21	
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	0	17,14	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	1	1	0
3	Rehabilitation of access roads	m2	2800	42,72	1	1	119616
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	0	447,42	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	4,47	242 984,15	0,08	1	86891,13204
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,26	166 847,44	1	1	43380,3344
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207 805,47	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	603 565,59	1	1	0
9	Rehabilitation of subsided areas	ha	0,03	139 709,60	1	1	0
10	General surface rehabilitation	ha	5	132 171,31	0,8	1	528685,24
11	River diversions	ha	0	132 171,31	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0	50 255,25	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	17 589,34	1	1	0
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
<b>Sub Total 1</b>							<b>778572,7064</b>
1	Preliminary and General		93428,72477		weighting factor 2 1		93428,72477
2	Contingencies				77857,27064		77857,27064
<b>Subtotal 2</b>							<b>949858,70</b>
SIGN							Khumbelo Makhado
DATE							2021/11/18
							VAT (15%)
							142478,81
<b>Grand Total</b>							<b>1092338</b>

#### 3.21.2 Confirm that this amount can be provided 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.

The mining operation will be self-funded through income generated by sales of the PGMs, Chrome ore, Copper, Nickel ore, Vanadium ore and Iron ore mined. Bridging finance, will be supplied where needed by potential investors.

### **3.22 Specific information required by the Competent Authority**

Compliance with the provisions of sections 24(4) (a) and (b) read with section 24 (3)(a) and (7) of the NEMA (107 of 1998). The EIA report must include the:

#### **3.22.1 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 an Appendix.

The proposed PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit will be established on a rehabilitate open pit with no activity and minimal vegetation cover. The PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit will, therefore, not have to compete with other land uses. Upon closure, the land will be rehabilitated to the possible nearest initial state before mining.

Due to the location of the PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit, there will be little to no negative impacts on the community. The dust and noise impacts that may emanate from the mining area during the operational phase could have a negative impact on the surrounding community if the mitigation measures proposed in this document are not implemented and managed on-site. However, due to the distance of the community from the mining area ( $\pm 600$  m) these impacts are of low-medium significance.

The operation of the mine will have many positive impacts, such as job creation for skilled, semi-skilled and unskilled permanent workers. The proposed PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore mine pit will therefore contribute locally by aiding in the development of the area and boosting the local economy through increased municipal revenue. On a national scale, this will aid by boosting the slowly growing SA economy.

#### **3.22.2 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 the Act, attach the investigation report and confirm that the applicable mitigation is reflected herein.

There are no heritage resources identified during site assessment.

### **3.23 Other matters required in terms of section 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 an Appendix.

The site and project alternatives investigated during the impact assessment process were done at the hand of information obtained during the site investigation, public participation process and desktop studies conducted of the study area. As discussed earlier, the following alternatives were considered:

- Establishment of a PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit 0.6 km away from the residence.
- Open cast mining (preferred alternative) vs. underground mining
- Temporary Infrastructure (preferred alternative) vs. permanent Infrastructure
- Access onto provincial road (preferred alternative) vs. access onto national road
- No-go alternative

## **PART B**

### **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

#### **4 Environmental management programme**

##### **4.1 Details of the EAP**

Confirm that the requirements for the provision of the details and expertise of the EAP are already included in Part A, section 1 (a) herein as required).

Details of the EAP are included in Part A of this report.

##### **4.2 Description of the aspects of the activity**

Confirm that the requirements to describe the aspects of the activity that are covered by the draft environmental management programme is already included in Part A, 2.2, herein, as required.

The aspects of the activity that are covered by the environmental management programme has been described and included in Part A, 2.2.

##### **4.3 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, such as buffers.

As mentioned in Part A, 2.1 this map has been compiled and is attached as APPENDIX 3.

##### **4.4 Description of impact management objectives, including management statements**

###### **4.4.1 Determination of closure objectives**

Ensure that the closure objectives are informed by the type of environment described.

The decommissioning phase will entail the rehabilitation of the mining site. Once mining activities cease, the area will be fully rehabilitated. The perimeter walls of the open cast pit will either be sloped at 1:3 to the pit floor to prevent soil erosion, or stepped by creating benches of not more than 3 m high. The applicant will comply with the minimum closure objectives as prescribed by DMRE and detailed below.

Rehabilitation of the excavated area:

- Rocks and coarse material removed from the excavation must be dumped into the excavation.

- No waste will be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials have been added to the excavation and profiled with acceptable contours and erosion control measures, the topsoil previously stored will be returned to its original depth over the area.
- The area will be fertilised if necessary to allow vegetation to establish rapidly. The site will be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from site closure.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area seeded with a vegetation seed mix to their specification.

#### Rehabilitation of plant area:

- The compacted areas will be ripped and the topsoil returned over the area.
- Coarse natural material used for the construction of ramps will be removed and dumped into the excavations.
- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects will be dealt with in accordance with Section 44 of the MPRDA, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or soils have been compacted by traffic, the surface will be scarified or ripped.
  - The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora if natural vegetation does not re-establish within 6 months of the closure of the site.
- Photographs of the mining area and office sites, before and during the mining operation and after rehabilitation, will be taken at selected fixed points and kept on record for the information of the Regional Manager.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, will be scarified to a depth of at least

300 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.

- Prior to replacing the topsoil, the overburden material that was removed from these areas will be replaced in the same order as it originally occurred.
- The area will then be fertilised if necessary to allow vegetation to establish rapidly. The site will be seeded with a local, adapted indigenous seed mix if natural vegetation does not re-establish within 6 months after closure of the site.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area seeded with a seed mix to their specification.

Final rehabilitation:

- Rehabilitation of the surface area will entail landscaping, levelling, top dressing, land preparation, seeding (if required), maintenance and weed/alien clearing.
- All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- Weed/alien clearing will be done sporadically during the life of the mining activities.
- Species regarded as Category 1 weeds according to CARA (Conservation of Agricultural Recourses Act, 1983 – Act 43; Regulations 15 & 16 (as amended in March 2001) need to be eradicated from the site.
- Final rehabilitation will be completed within a period specified by the Regional



Manager.

#### **4.5 Volume and rate of water use required for the operation**

After careful consideration of the scale of operation it has been deduced that approximately 18 000 L of water will be used per day.

#### **4.6 Has a water use licence has been applied for?**

No water use license has been applied for as part of this this Mining Permit application. Water required for dust suppression will be trucked in.

## 4.7 Impacts to be mitigated in their respective phases

Measures to rehabilitate the environment affected by the undertaking of any listed activity.

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
E.g. for prospecting – drill site, site camp, ablution, facilities, accommodation, equipment storage, sample storage, site office, access route, etc. E.g. for mining – excavations, blasting, stockpiles, discard dumps/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.	Of operation in which activity will take place. State: Planning and design, pre-construction, construction operational, rehabilitation, closure, post-closure	Volumes, tonnages and hectares or m <sup>2</sup>	Describe how recommendations herein will remedy the cause of pollution or degradation	Description of how each recommendation herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	Describe the time period when the measures in the environmental management program must be implemented. Measures must be implemented when required. With regard to rehabilitation specifically this must take place at the earliest opportunity. About rehabilitation, therefore state either: Upon cessation of the individual activity or, upon cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Stripping and stockpiling of topsoil	Site establishment/ construction phase	4.9ha	<p><b>Visual mitigation</b></p> <ul style="list-style-type: none"> <li>The site must be neat and kept in good condition always.</li> <li>Upon closure, the site must be rehabilitated and sloped to ensure that visual impact on the aesthetic value of the area is minimal.</li> </ul> <p><b>Dust handling</b></p> <ul style="list-style-type: none"> <li>Dust liberation into the surrounding environment must be effectively controlled using, inter alia, water spraying and/or other dust-allaying agents.</li> </ul>	<ul style="list-style-type: none"> <li>Dust and Noise: NEMAQA, 2004</li> <li>Regulation 6(1)</li> <li>Weeds: CARA, 1983</li> <li>Storm Water: NWA, 1998</li> <li>Waste: NEM: WA, 2008</li> </ul>	Throughout the site establishment phase.

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<ul style="list-style-type: none"> <li>• The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness.</li> <li>• Speed on the access roads must be limited to 40km/h to prevent excess dust generation.</li> <li>• Roads must be sprayed with water or an environmentally-friendly dust-allaying agent that contains no PCBs (e.g. DAS products) if dust is generated above acceptable limits.</li> </ul> <p><b>Noise handling</b></p> <ul style="list-style-type: none"> <li>• The applicant must ensure that staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.</li> <li>• No loud music permitted at the mining area.</li> <li>• All mining vehicles must be equipped with silencers and kept roadworthy in terms of the Road Transport Act.</li> </ul> <p><b>Weed and invader plant management</b></p> <ul style="list-style-type: none"> <li>• A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of CORA (Act No 43 1983).</li> <li>• Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<ul style="list-style-type: none"> <li>○ The plants can be uprooted, felled or cut off and can be destroyed completely.</li> <li>○ The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide.</li> <li>○ The temporary topsoil stockpiles must be kept free of weeds.</li> </ul> <p><b>Storm water handling</b></p> <ul style="list-style-type: none"> <li>● Storm water must be diverted around the topsoil heaps, stockpile areas and access roads to prevent erosion and material loss.</li> <li>● Runoff water must be diverted around the stockpile areas with trenches and contour structures to prevent erosion of the work areas.</li> </ul> <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>● No processing area or waste pile may be established within 100 m of the edge of any river channel or other water bodies.</li> <li>● Regular vehicle maintenance may only take place in the service bay area of the off-site workshop. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 L closed container/bin to be removed from the</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>emergency service area to the workshop to ensure proper disposal.</p> <ul style="list-style-type: none"> <li>• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, for resale or appropriate disposal at a recognized facility.</li> <li>• Spills must be cleaned immediately to the satisfaction of the Regional Manager by removing the spillage and the polluted soil and disposing it at a recognized facility. Proof must be filed.</li> <li>• Suitable covered receptacles must be available at all times and conveniently placed for waste disposal.</li> <li>• Non-biodegradable refuse, such as glass bottles, plastic bags, metal scrap, etc., must be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area.</li> <li>• Biodegradable refuse generated must be handled as indicated above.</li> </ul>		
Excavation	Operational phase	3.9ha	<p><b>Visual mitigation</b></p> <ul style="list-style-type: none"> <li>• The site needs to have a neat appearance and be kept in good condition always.</li> <li>• Upon closure, the site needs to be</li> </ul>	<p><b>Dust and noise</b> NEM: AQA, 2004 Regulation 6(1)  <b>Health and safety</b> MHSA, 1996</p>	Throughout the operational phase

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>rehabilitated and sloped to ensure that the visual impact on the aesthetic value of the area is kept to a minimum.</p> <p><b>Dust handling</b></p> <ul style="list-style-type: none"> <li>• Dust liberation into the surrounding environment must be effectively controlled using inter alia, water spraying and/or other dust-allaying agents.</li> <li>• The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness.</li> <li>• Speed on the access roads must be limited to 40km/h to prevent the generation of excess dust.</li> <li>• Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCBs (e.g. DAS products) if dust is generated above acceptable limits.</li> </ul> <p><b>Noise handling</b></p> <ul style="list-style-type: none"> <li>• The applicant must ensure that staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.</li> <li>• No loud music permitted at the mining area.</li> <li>• All mining vehicles must be equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.</li> </ul>	<p>OHSA, 1993 OHSAS 18001</p> <p><b>Fauna and flora</b> NEM:BA, 2004</p> <p><b>Waste</b> NEMWA, 2008</p> <p><b>Weeds</b> CARA, 1983</p>	

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p><b>Management of health and safety risks</b></p> <ul style="list-style-type: none"> <li>• Workers must have access to the correct PPE as required by law.</li> <li>• All operations must comply with the OHS&amp;A.</li> </ul> <p><b>Protection of fauna and flora</b></p> <ul style="list-style-type: none"> <li>• The site manager should ensure that no fauna is caught, killed, harmed, sold or played with.</li> <li>• Workers should be instructed to report any animals that may be trapped in the working area.</li> <li>• No snares may be set, or nests raided for eggs or young.</li> <li>• No plants or trees may be removed without the approval of the ECO.</li> </ul> <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• No processing area or waste pile may be established within 100 m of the edge of any river channel or other water bodies.</li> <li>• Regular vehicle maintenance may only take place within the service bay area of the off-site workshop. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 L closed container/bin to be removed from the emergency service area to the workshop in order to ensure proper disposal.</li> </ul>		



Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<ul style="list-style-type: none"> <li>• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from site, for resale/ appropriate disposal at a recognized facility.</li> <li>• Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage and polluted soil and disposing it at a recognized facility. Proof must be filed.</li> <li>• Suitable covered receptacles must be available at all times and conveniently placed for waste disposal.</li> <li>• Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognized landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.</li> <li>• Biodegradable refuse generated must be handled as indicated above.</li> </ul> <p><b>Management of weed/invader plants</b></p> <ul style="list-style-type: none"> <li>• A weed and invader plant control management plan must be implemented at the site to ensure eradication of all listed invader plants in terms of CORA (Act No 43 1983).</li> <li>• Management must take responsibility</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used:</p> <ul style="list-style-type: none"> <li>○ The plants can be uprooted, felled or cut off and can be destroyed completely.</li> <li>○ The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide.</li> <li>○ The temporary topsoil stockpiles need to be kept free of weeds.</li> </ul>		
Crushing	Operational phase	0.3ha	<p><b>Dust handling</b></p> <ul style="list-style-type: none"> <li>• Dust liberation into the surrounding environment must be effectively controlled by using, inter alia, water spraying and/or other dust-allaying agents.</li> <li>• The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness.</li> <li>• Speed on the access roads must be limited to 40km/h to prevent excess dust generation.</li> <li>• The crusher plant must have operational water sprayers to alleviate dust generation from conveyor belts.</li> </ul> <p>Noise handling</p> <ul style="list-style-type: none"> <li>• The applicant must ensure that staff</li> </ul>	<p><b>Dust and noise</b> NEMAQA 2004</p> <p><b>Waste</b> NEMWA 2008</p>	Throughout the operational phase

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>conduct themselves in an acceptable manner while on site, during work hours and after hours.</p> <ul style="list-style-type: none"> <li>• No loud music permitted at the mining area.</li> <li>• All mining vehicles must be equipped with silencers and kept roadworthy in terms of the Road Transport Act.</li> </ul> <p>Waste management</p> <ul style="list-style-type: none"> <li>• No processing area or waste pile may be established within 100 m of the edge of any river channel or other water bodies.</li> <li>• Regular vehicle maintenance may only take place in the service bay of the off-site workshop. If emergency repairs are needed on equipment not able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 L closed container/bin to be removed from the emergency service area to the workshop for proper disposal.</li> <li>• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from site, either for resale or appropriate disposal at a recognized facility.</li> <li>• Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing spillage and</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>polluted soil and by disposing it at a recognized facility. Proof must be filed.</p> <ul style="list-style-type: none"> <li>• Suitable covered receptacles must be available at all times and conveniently placed for the disposal of waste.</li> <li>• Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognized landfill site. Specific precautions must be taken to prevent refuse from being dumped on or in the vicinity of the mine area.</li> <li>• Biodegradable refuse generated must be handled as indicated above.</li> </ul>		
Stockpiling and transporting	Operational phase	0.7ha	<p><b>Visual mitigation</b></p> <ul style="list-style-type: none"> <li>• The site must always be neat and be kept in good condition .</li> <li>• Upon closure, the site must be rehabilitated and sloped to ensure that the visual impact on the aesthetic value of the area is minimal.</li> </ul> <p><b>Storm water handling</b></p> <ul style="list-style-type: none"> <li>• Storm water must be diverted around the stockpile areas and access roads to prevent erosion and material loss.</li> <li>• Runoff water must be diverted around the stockpile areas with trenches and contour structures to prevent erosion of work areas.</li> <li>• Mining must be conducted in</li> </ul>	<p><b>Storm water</b> NWA, 1998</p> <p><b>Weeds</b> CARA, 1983</p> <p><b>Dust and noise</b> NEMAQA, 2004 Regulation 6(1)</p> <p><b>Waste</b> NEMWA, 2008</p>	Throughout operational phase

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the DWS, and any other conditions that the DWS may impose:</p> <ul style="list-style-type: none"> <li>• Clean water (e.g. rainwater) must be kept clean and be routed to a natural watercourse by a system separate from the dirty water system. Prevent clean water from running or spilling into dirty water systems.</li> <li>• Dirty water must be collected and contained in a system separate from the clean water system.</li> <li>• Dirty water must be prevented from spilling/seeping into clean water systems.</li> <li>• The storm water management plan must apply for the entire life cycle of the mine and over different hydrological cycles (rainfall patterns).</li> <li>• The statutory requirements of various regulatory agencies and the interests of stakeholders must be considered and incorporated into the storm water management plan.</li> </ul> <p><b>Management of weed/invader plants</b></p> <ul style="list-style-type: none"> <li>• A weed and invader plant control management plan must be implemented at the site to ensure</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>eradication of all listed invader plants in terms of CORA (Act No 43 1983).</p> <ul style="list-style-type: none"> <li>• Management must take responsibility to control declared invader or exotic species on the rehabilitated areas. The following control methods can be used: <ul style="list-style-type: none"> <li>○ The plants can be uprooted, felled or cut off and can be destroyed completely.</li> <li>○ The plants can be treated with an herbicide that is registered for use in connection therewith and in accordance with the directions for the use of such an herbicide.</li> </ul> </li> <li>• The temporary stockpile area must be kept free of weeds.</li> </ul> <p><b>Dust handling</b></p> <ul style="list-style-type: none"> <li>• Dust liberation into the surrounding environment must be effectively controlled using inter alia, water spraying and/or other dust-allaying agents.</li> <li>• The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness.</li> <li>• Speed on the access roads must be limited to 40km/h to prevent excess dust generation.</li> <li>• Roads must be sprayed with water or an environmentally-friendly dust-allaying agent that contains no PCBs</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>(e.g. DAS products) if dust is generated above acceptable limits.</p> <p>Management of access roads</p> <ul style="list-style-type: none"> <li>• Storm water should be diverted around the access roads to prevent erosion.</li> <li>• Vehicular movement must be restricted to existing access routes to prevent crisscrossing of tracks through undisturbed areas.</li> <li>• Rutting and erosion of the access road caused as a result of the mining activities must be repaired by the applicant.</li> </ul> <p><b>Noise handling</b></p> <ul style="list-style-type: none"> <li>• The applicant must ensure that staff conduct themselves in an acceptable manner while on site, both during work hours and after hours.</li> <li>• No loud music permitted at the mining area.</li> <li>• All mining vehicles must be equipped with silencers and kept roadworthy in terms of the Road Transport Act.</li> </ul> <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• No processing area or waste pile may be established within 100 m of the edge of any river channel or other water bodies.</li> <li>• Regular vehicle maintenance may only take place in the service bay area of the off-site workshop. If emergency repairs are needed on equipment not</li> </ul>		



Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>able to move to the workshop, drip trays must be present. All waste products must be disposed of in a 200 L closed container/bin to be removed from the emergency service area to the workshop for proper disposal.</p> <ul style="list-style-type: none"> <li>• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from site, for resale or appropriate disposal at a recognized facility.</li> <li>• Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage and polluted soil and disposing of it at a recognized facility. Proof must be filed.</li> <li>• Suitable covered receptacles must be available at all times and conveniently placed for waste disposal.</li> <li>• Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., should be stored in a container with a closable lid at a collecting point and collected on a regular basis and disposed of at a recognized landfill site. Specific precautions should be taken to prevent refuse from being dumped on or near the mine area.</li> <li>• Biodegradable refuse generated must be handled as indicated above.</li> </ul>		
Sloping and	Decommissioning	4.9 ha	<b>Storm water handling</b>	<b>Storm water</b>	Upon cessation of

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
landscaping during rehabilitation	phase		<ul style="list-style-type: none"> <li>• Storm water must be diverted around the rehabilitated area to prevent erosion and loss of reinstated material.</li> </ul> <p><b>Management of health and safety risks</b></p> <ul style="list-style-type: none"> <li>• Excavations have to be rehabilitated as stipulated in the closure plan to ensure the site is safe upon closure.</li> <li>• Workers must have access to the correct PPE as required by law.</li> <li>• All operations must comply with the OHS Act.</li> </ul> <p><b>Dust handling</b></p> <ul style="list-style-type: none"> <li>• Dust liberation into the surrounding environment must be effectively controlled by the use of, inter alia, water spraying and/or other dust-allaying agents.</li> <li>• The site manager must ensure continuous assessment of all dust suppression equipment to confirm its effectiveness.</li> <li>• Speed on the access roads must be limited to 40km/h to prevent excess dust generation.</li> <li>• Roads must be sprayed with water or an environmentally friendly dust-allaying agent that contains no PCBs (e.g. DAS products) if dust is generated above acceptable limits.</li> </ul> <p><b>Noise handling</b></p> <ul style="list-style-type: none"> <li>• The applicant must ensure that staff conduct themselves in an acceptable</li> </ul>	<p>NWA, 1998</p> <p><b>Health and safety</b></p> <p>MHSA, 1996 OHS Act, 1993 OHSAS 18001</p> <p><b>Dust and noise</b></p> <p>NEMAQA 2004, Regulation 6(1)</p> <p><b>Waste</b></p> <p>NEMWA 2008</p>	mining

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>manner while on site, both during work hours and after hours.</p> <ul style="list-style-type: none"> <li>• No loud music permitted at the mining area.</li> <li>• All mining vehicles must be equipped with silencers and kept roadworthy in terms of the Road Transport Act.</li> </ul> <p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried/burned on site</li> <li>• Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from site, for resale/ appropriate disposal at a recognized facility.</li> <li>• Spills must be cleaned up immediately to the satisfaction of the Regional Manager by removing the spillage together with the polluted soil and disposing of it at a recognized facility. Proof should be filed.</li> <li>• Suitable covered receptacles must be available at all times and conveniently placed for waste disposal.</li> <li>• Non-biodegradable refuse, like glass bottles, plastic bags, metal scrap, etc., should be stored in a container with a</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>closable lid at a collecting point and collected on a regular basis and disposed of at a recognized landfill site. Specific precautions should be taken to prevent refuse from being dumped on or in the vicinity of the mine area.</p> <ul style="list-style-type: none"> <li>• Biodegradable refuse generated must be handled as indicated above.</li> </ul>		
Replacing of topsoil and rehabilitation of disturbed area	Decommissioning phase	4.9ha	<p><b>Rehabilitation of excavated area</b></p> <ul style="list-style-type: none"> <li>• Rocks and coarse material removed from the excavation must be dumped into the excavation.</li> <li>• No waste will be permitted to be deposited in the excavations.</li> <li>• Once overburden, rocks and coarse natural materials have been added to the excavation and were profiled with acceptable contours and erosion control measures, the topsoil previously stored will be returned to its original depth over the area.</li> <li>• The area will be fertilized if necessary to allow vegetation to establish rapidly. The site will be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from site closure.</li> <li>• If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional</li> </ul>	<p><b>Rehabilitation</b> MPRDA, 2008</p> <p><b>Health and safety</b> MHSA, 1996 OHSA, 1993 OHSAS 18001</p> <p><b>Dust and noise</b> NEMAQA, 2004 Regulation 6(1)</p> <p><b>Weeds</b> CARA, 1983</p> <p><b>Waste</b> NEMWA, 2008</p>	Upon cessation of mining

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area seeded with a vegetation seed mix to his or her specification.</p> <p><b>Rehabilitation of plant area</b></p> <ul style="list-style-type: none"> <li>• The compacted areas will be ripped and the topsoil returned over the area.</li> <li>• Coarse natural material used for the construction of ramps will be removed and dumped into the excavations.</li> <li>• Stockpiles will be removed during the decommissioning phase, the area ripped and topsoil returned to original depth to provide a growth medium.</li> <li>• On completion of operations, all structures or objects will be dealt with in accordance with Section 44 of the MPRDA 2002 (Act 28 of 2002): <ul style="list-style-type: none"> <li>○ Where sites have been rendered devoid of vegetation/grass or soils have been compacted by traffic, the surface will be scarified or ripped.</li> <li>○ The site will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora if natural vegetation does not re-establish within 6 months of site closure.</li> <li>○ Photographs of the mining area</li> </ul> </li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>and office sites, before and during the mining operation and after rehabilitation, will be taken at selected fixed points and kept on record for the information of the Regional Manager.</p> <ul style="list-style-type: none"> <li>○ On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, will be scarified to a depth of at least 300 mm and graded to an even surface condition. The previously stored topsoil will be returned to its original depth over the area.</li> <li>○ Prior to replacing the topsoil, the overburden material that was removed from these areas will be replaced in the same order as it originally occurred.</li> <li>○ The area will then be fertilized if necessary to allow vegetation to establish rapidly. The site will be seeded with a local, adapted indigenous seed mix if natural vegetation does not re-establish within 6 months after site closure.</li> <li>○ If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			<p>Manager may require that the soil be analyzed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to their specification.</p> <p><b>Final rehabilitation</b></p> <ul style="list-style-type: none"> <li>• Rehabilitation of the surface area will entail landscaping, levelling, top dressing, land preparation, seeding (if required) and maintenance, and weed/alien clearing.</li> <li>• All infrastructure, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA).</li> <li>• Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognized landfill facility. It will not be permitted to be buried/burned on site.</li> <li>• Weed/alien clearing will be done in a sporadic manner during the life of the mining activities. Species regarded as Category 1 weeds according to CORA, 1983 – Act 43; Regulations 15 &amp; 16 (as amended in March 2001) must be eradicated from the site.</li> <li>• Final rehabilitation will be completed within a period specified by the</li> </ul>		

Activities	Phase	Size and scale of disturbance	Mitigation measures	Compliance with standards	Time period for implementation
			Regional Manager.		



## 4.8 Impact management outcomes

A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph.

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
Whether listed or not. E.g. excavations, blasting, stockpiles, discard dumps/ dams, loading, hauling, transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.	E.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc.		In which impact is anticipated. E.g. construction, commissioning, operational decommissioning, closure and post-closure.	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.	Impact avoided, noise levels, dust levels, rehabilitation standards, end-use objectives, etc.
<b>Topsoil stripping and stockpiling</b>	Visual intrusion associated with the establishment of the mining area.	The visual impact may affect the residents of the immediate area.	<b>Site establishment/ construction phase</b>	Control: Implementation of proper housekeeping	<ul style="list-style-type: none"> <li>Impact on the surrounding environment mitigated until rehabilitation standards can be implemented.</li> </ul>
	Dust nuisance caused by soil disturbance.	Dust will be contained within property boundaries and therefore affect only the landowner.		Control: Dust suppression	<ul style="list-style-type: none"> <li>Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1\,200 \text{ mg/m}^2/\text{day}</math>.</li> <li>Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – particulates <math>&gt; 1/10^{\text{th}}</math> of the occupational exposure limit. NEMAQA 2004, Regulation 6(1)</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	The noise impact should be contained within property boundaries but might have a periodic impact on the closest residents of the Bapong community.		Control: Noise control measures	<ul style="list-style-type: none"> <li>Noise levels on the site must be managed and needs to comply with the standards stipulated in NEMAQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008</li> <li>Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Infestation of the topsoil heaps by weeds and invader plants	Biodiversity		Control and remedy: Implementation of weed control	<ul style="list-style-type: none"> <li>The impact must be avoided through the eradication of Category 1 weeds/ invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>
	Loss of topsoil due to incorrect storm water management.	Loss of topsoil will affect the rehabilitation of the mining area.		Control: Storm water management	<ul style="list-style-type: none"> <li>The impact must be avoided through the implementation of storm water management.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste materials.	Contamination may cause surface or ground water contamination if not addressed		Control and remedy: Implementation of waste management	<ul style="list-style-type: none"> <li>The impact must be avoided through the implementation of the mitigation measures stipulated in this document.</li> <li>Should spillage occur, the area needs to be cleaned in accordance with the standards of the NEMWA, 2008.</li> </ul>
				Control: Noise control measure	<ul style="list-style-type: none"> <li>Noise levels on the site has to be managed and need to comply with the standards stipulated in NEMAQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008</li> <li>Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
<b>Excavation</b>	Visual intrusion associated with the excavation activities	The visual impact may affect the residents of the immediate area.	<b>Operational phase</b>	Control: Implementation of proper housekeeping	<ul style="list-style-type: none"> <li>Impact on the surrounding environment mitigated until rehabilitation standards can be implemented.</li> </ul>
	Dust nuisance due to excavation activities.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	<ul style="list-style-type: none"> <li>Fallout dust levels must comply with the acceptable dust fall rate published for non-residential areas, as per National Dust Control</li> <li>Regulations 2013 – 600 &lt; Dust Fall &lt; 1 200 mg/m<sup>2</sup>/day.</li> <li>Gravimetric dust levels must comply with the standard published in the NIOSH guidelines –Particulates &gt;1/10<sup>th</sup> of the occupational exposure limit.</li> <li>NEMAQA, 2004 Regulation 6(1).</li> </ul>
Noise nuisance generated by excavation equipment	The noise impact must be contained within the boundaries of the property but might have a periodic impact on the closest residents of the Bapong community.	Control: Noise control measures		<ul style="list-style-type: none"> <li>Noise levels on the site has to be managed and need to comply with the standards stipulated in NEMAQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>	
Unsafe working conditions for employees.	Impact might affect employees	Control: Health and safety monitoring and management		<ul style="list-style-type: none"> <li>Impact must be avoided through compliance with the MHS Act, 1996, OHS Act, 1993 and OHSAS 18001</li> </ul>	
<b>Excavation</b>	Negative impact on the fauna and flora of the area.	Biodiversity	<b>Operational phase</b>	Control: Protection of fauna and flora through operational phase	<ul style="list-style-type: none"> <li>The impact must be avoided through implementation of the mitigation measures stipulated in this document.</li> <li>NEMBA, 2004.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste	Contamination may cause surface or ground water		Control: Implementation of waste	<ul style="list-style-type: none"> <li>The impact should be avoided through the implementation the mitigation</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	materials.	contamination if not addressed.		management	<p>measures stipulated in this document.</p> <ul style="list-style-type: none"> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEMWA, 2008.</li> </ul>
	Weed and invader plant infestation of the area.	Biodiversity		Control: Implementation of weed control	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>
<b>Crushing</b>	Dust nuisance due to the crushing activities	Dust will be contained within the property boundaries and will therefore affect only the landowner.	<b>Operational phase</b>	Control: Dust suppression	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1\ 200 \text{ mg/m}^2/\text{day}</math>.</li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates <math>&gt;1/10^{\text{th}}</math> of the occupational exposure limit.</li> <li>• NEMAQA, 2004 Regulation 6(1).</li> </ul>
	Noise nuisance generated by the crushing activities	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong community.		Control: Noise control measures	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEMAQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste materials.	Contamination may cause surface or ground water contamination if not addressed.		Control: Implementation of waste management	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
					with the standards of the NEMWA, 2008.
	Loss of material due to ineffective storm water handling.	Impact will affect income of applicant.		Control: Storm water control measures	<ul style="list-style-type: none"> <li>The impact should be avoided through the implementation of storm water management.</li> </ul>
	Weed and invader plant infestation of the area due to the disturbance of the soil	Biodiversity		Control and remedy: Implementation of weed control	<ul style="list-style-type: none"> <li>The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>
<b>Stockpiling and transporting</b>	Dust nuisance from stockpiled material and vehicles transporting the material.	Dust will be contained within the property boundaries and will therefore affect only the landowner.	<b>Operational phase</b>	Control: Dust suppression	<ul style="list-style-type: none"> <li>Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 &lt; Dust Fall &lt; 1 200 mg/m<sup>2</sup>/day.</li> <li>Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates &gt;1/10<sup>th</sup> of the occupational exposure limit.</li> <li>NEMAQA, 2004 Regulation 6(1).</li> </ul>
	Degradation of access roads.	All road users will be affected.		Control and remedy: Road management	<ul style="list-style-type: none"> <li>The impact should be avoided through the implementation of the mitigation measures proposed in this document.</li> </ul>
	Noise nuisance caused by vehicles.	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong community.		Control: Noise management monitoring and management	<ul style="list-style-type: none"> <li>Noise levels on the site has to be managed and need to comply with the standards stipulated in NEMAQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
<b>Sloping and landscaping during</b>	Contamination of area with hydrocarbons or	Contamination may cause surface or	<b>Decommissioning phase</b>	Control: Implementation of	<ul style="list-style-type: none"> <li>The impact should be avoided through the implementation the</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
rehabilitation	hazardous waste materials	ground water contamination if not addressed.		waste management	<p>mitigation measures stipulated in this document.</p> <ul style="list-style-type: none"> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM: WA, 2008.</li> </ul>
	Soil erosion	Biodiversity		Control: Soil management	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• CARA, 1993</li> </ul>
	Health and safety risk posed by un-sloped areas	Impact will affect employees and residents of the property		Control: Health and safety monitoring and management.	<ul style="list-style-type: none"> <li>• The impact should be avoided through compliance with the standards of the MHSA, 1996, OHSA, 1993 and OHSAS 18001</li> </ul>
	Dust nuisance caused during sloping and landscaping activities.	Dust will be contained within the property boundaries and will therefore affect only the landowner.		Control: Dust suppression	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 &lt; Dust Fall &lt; 1 200 mg/m<sup>2</sup>/day.</li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates &gt;1/10 of the occupational exposure limit. NEM: AQA, 2004 Regulation 6(1).</li> </ul>
	Noise nuisance caused by machinery.	The noise impact should be contained within the boundaries of the property, but might have a periodic impact on the closest residents of the Bapong community.		Control: Noise monitoring	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Contamination of area	Contamination may		Control: Waste	<ul style="list-style-type: none"> <li>• The impact should be avoided through</li> </ul>

Activity	Potential impact	Aspects affected	Phase	Mitigation type	Standard to be achieved
	with hydrocarbons or hazardous waste materials.	cause surface or ground water contamination if not addressed.		management	<p>the implementation the mitigation measures stipulated in this document.</p> <ul style="list-style-type: none"> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM: WA, 2008.</li> </ul>
<b>Replacing of topsoil and rehabilitation of disturbed area</b>	Loss of reinstated topsoil due to the absence of vegetation	Biodiversity and soil management	<b>Decommissioning phase</b>	Control: Soil management	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• CARA, 1993</li> </ul>
	Infestation of the area by weed and invader plants.	Biodiversity and soil management		Control and remedy: Implementation of weed control	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>

## 4.9 Impact management actions

A description of impact management actions, identifying the manner in which the impact management objectives and outcomes in paragraph (c) and (d) will be achieved.

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
Whether listed or not, e.g. excavations, blasting, stockpiles, discard dumps/dams, loading, hauling, transport, water supply dams, boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc.	E.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution, etc.	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. E.g. Modify through alternative method, control through noise control, control through management and monitoring, and remedy through rehabilitation.	Describe the time period when the measures in the environmental management program 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.	A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities
<b>Topsoil stripping and stockpiling</b>	Visual intrusion associated with the establishment of the mining area.	Control: Implementation of proper housekeeping	To be implemented daily throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	Impact on the surrounding environment must be mitigated until rehabilitation standards can be implemented in terms of the MRDA.
	Dust nuisance caused by the disturbance of soil.	Control: Dust suppression	To be implemented daily throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance</li> </ul>	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1200 \text{ mg/m}^2/\text{day}</math>.</li> </ul>



Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
			monitoring of site by an <ul style="list-style-type: none"> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates &gt;1/10<sup>th</sup> of the occupational exposure limit NEMAQA, 2004 Regulation 6(1)</li> </ul>
	Noise nuisance caused by machinery stripping and stockpiling the topsoil.	Control: Noise control measures	To be implemented daily throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Infestation of the topsoil heaps by weeds and invader plants	Control and remedy: Implementation of weed control	To be implemented when necessary throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>
	Loss of topsoil due to incorrect storm water management.	Control: Storm water management	To be implemented daily throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control officer</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation of storm water management.</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	Contamination of area with hydrocarbons or hazardous waste materials	Control and remedy: Implementation of waste management	To be implemented daily throughout the site establishment / construction phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation of the mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM: WA, 2008.</li> </ul>
<b>Excavation</b>	Visual intrusion associated with the excavation activities	Control: Implementation of proper housekeeping	To be implemented daily throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Impact on the surrounding environment mitigated until rehabilitation standards can be implemented.</li> </ul>
	Dust nuisance due to excavation activities.	Control: Dust suppression	To be implemented daily throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1200 \text{ mg/m}^2/\text{day}</math></li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates <math>&gt;1/10^{\text{th}}</math> of the occupational exposure limit.</li> <li>• NEM: AQA, 2004 Regulation 6(1).</li> </ul>
	Noise nuisance generated by excavation equipment.	Control: Noise control measures	To be implemented daily throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the noise standards of SANS</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
			<ul style="list-style-type: none"> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<p>10103:2008.</p> <ul style="list-style-type: none"> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Unsafe working conditions for employees.	Control: Health and safety monitoring and management	<p>To be daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through compliance with the standards of the MHSA, 1996, OHSA, 1993 and OHSAS 18001</li> </ul>
	Negative impact on the fauna and flora of the area.	Control: Protection of fauna and flora through operational phase	<p>To be daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation of the mitigation measures stipulated in this document.</li> <li>• NEM:BA, 2004.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste materials.	Control: Implementation of waste management	<p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM: WA, 2008.</li> </ul>
	Weed and invader plant infestation of the area.	Control: implementation of weed control	<p>To be implemented when necessary throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
<b>Crushing</b>	Dust nuisance due to the crushing activities	Control: Dust suppression	<p>monitoring of site by an</p> <ul style="list-style-type: none"> <li>• Environmental Control Officer.</li> </ul> <p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1200 \text{ mg/m}^2/\text{day}</math>.</li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates <math>&gt;1/10^{\text{th}}</math> of the occupational exposure limit.</li> <li>• NEM: AQA, 2004 Regulation 6(1).</li> </ul>
	Noise nuisance generated by the crushing activities.	Control: Noise control measures	<p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste materials.	Control: Implementation of waste management	<p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEM: WA, 2008.</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
<b>Stockpiling and transporting</b>	Visual intrusion associated with the stockpiled material and vehicles transporting the material.	Control: Implementation of proper housekeeping	To be implemented daily throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Impact on the surrounding environment mitigated until rehabilitation standards can be implemented.</li> </ul>
	Loss of material due to ineffective storm water handling.	Control: Storm water control measures	<ul style="list-style-type: none"> <li>• To be implemented daily throughout the operational phase:</li> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation of storm water management</li> </ul>
	Weed and invader plant infestation of the area due to the disturbance of the soil	Control and remedy: Implementation of weed control	To be implemented when necessary throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>
	Dust nuisance from stockpiled material and vehicles transporting the material.	Control: Dust suppression	To be implemented daily throughout the operational phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – <math>600 &lt; \text{Dust Fall} &lt; 1200 \text{ mg/m}^2/\text{day}</math>.</li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines –</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
				<p>Particulates &gt;1/10<sup>th</sup> of the occupational exposure limit.</p> <ul style="list-style-type: none"> <li>• NEM: AQA, 2004 Regulation 6(1).</li> </ul>
	Degradation of access roads	Control and remedy: Road management	<p>To be implemented when necessary throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation of the mitigation measures proposed in this document.</li> </ul>
	Noise nuisance caused by vehicles.	Control: Noise management monitoring and management	<p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the noise standards of SANS 10103:2008.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>
	Contamination of area with hydrocarbons or hazardous waste materials.	Control: Implementation of waste management	<p>To be implemented daily throughout the operational phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEMWA, 2008.</li> </ul>
<b>Sloping and landscaping during rehabilitation</b>	Soil erosion	Control: Soil management	<p>To be implemented throughout the rehabilitation / closure phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
			<ul style="list-style-type: none"> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• CARA, 1993</li> </ul>
	Health and safety risk posed by un-sloped areas	Control: Health and safety monitoring and management.	<p>To be implemented throughout the rehabilitation / closure phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through compliance with the standards of the MHSA, 1996, OHSA, 1993 and OHSAS 18001</li> </ul>
	Dust nuisance caused during sloping and landscaping activities.	Control: Dust suppression	<p>To be implemented throughout the rehabilitation / closure phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Fallout dust levels has to comply with the acceptable dust fall rate published for non-residential areas in the National Dust Control Regulations 2013 – 600 &lt; Dust Fall &lt; 1 200 mg/m<sup>2</sup>/day.</li> <li>• Gravimetric dust levels have to comply with the standard published in the NIOSH guidelines – Particulates &gt;1/10<sup>th</sup> of the occupational exposure limit.</li> <li>• NEM: AQA, 2004 Regulation 6(1).</li> </ul>
	Noise nuisance caused by machinery.	Control: Noise monitoring	<p>To be implemented throughout the rehabilitation / closure phase:</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise levels on the site has to be managed and need to comply with the standards stipulated in NEM: AQA, 2004 Regulation 6(1) as well as the <i>noise standards of SANS 10103:2008</i>.</li> <li>• Employees working in areas with noise levels of more than 82dBA need to be issue with hearing protection.</li> </ul>

Activity	Potential impact	Mitigation type	Time period for implementation	Compliance with standards
	Contamination of area with hydrocarbons or hazardous waste materials.	Controls: Waste management	To be implemented throughout the rehabilitation / closure phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact must be avoided through implementation of mitigation measures stipulated in this document.</li> <li>• Should spillage however occur the area needs to be cleaned in accordance with the standards of the NEMWA, 2008.</li> </ul>
<b>Replacing of topsoil and rehabilitation of disturbed area</b>	Loss of reinstated topsoil due to the absence of vegetation	Control: Soil management	To be implemented throughout the rehabilitation / closure phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the implementation the mitigation measures stipulated in this document.</li> <li>• CARA, 1993</li> </ul>
	Infestation of the area by weed and invader plants.	Control and remedy: Implementation of weed control	To be implemented throughout the rehabilitation / closure phase: <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Compliance monitoring of site by an Environmental Control Officer.</li> </ul>	<ul style="list-style-type: none"> <li>• The impact should be avoided through the eradication of Category 1 weeds/invader plants in terms of CARA, 1993 as well as the implementation of the mitigation measures in this document.</li> </ul>



## **5 Determination of the amount of financial provision**

### **5.1 Closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation**

Once mining activities cease, the area will be fully rehabilitated. The perimeter walls of the opencast pit will either be sloped at 1:3 to the pit floor to prevent soil erosion or be stepped by creating benches of not more than 3 m high. Compacted soil will be ripped and levelled in order to re-establish a growth medium. Stockpiles will be removed during the decommissioning phase, the stockpile area ripped and available topsoil that was removed will be spread over worked areas to enhance the establishment of vegetation. All waste materials will be removed from the site and dumped at recognised landfill sites. The applicant will comply with the minimum closure objectives as prescribed by DMRE.

### **5.2 Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and I&APs**

This report, the Basic Assessment Report, includes all the environmental objectives in relation to closure and is available for perusal by I&AP's and stakeholders. Any additional comments received during the commenting period will be added to the Final Basic Assessment Report to be submitted to DMRE for approval.

### **5.3 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**

The requested rehabilitation plan is attached .Upon closure of the mine, all infrastructures will be removed. The compacted areas will be ripped and levelled upon which the topsoil will be replaced. The sides of the pit will be sloped to ensure safety and prevent erosion. No permanent structures will remain upon closure of the site.

### **5.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives**

The decommissioning phase will entail the rehabilitation of the mining site. Upon cessation of the mining activities, the area will be fully rehabilitated. The perimeter walls of the opencast pit will be sloped at 1:3 to the pit floor to prevent soil erosion or stepped by creating benches of not more than 3 m. The rehabilitation of the

PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore pit as indicated on the rehabilitation plan. Will comply with the minimum closure objectives as prescribed by DMRE and detailed in the following, and therefore is deemed to be compatible.

#### **5.4.1 Rehabilitation of the excavated area**

- Rocks and coarse material removed from the excavation must be dumped into the excavation.
- No waste will be permitted to be deposited in the excavations.
- Once overburden, rocks and coarse natural materials has been added to the excavation and was profiled with acceptable contours and erosion control measures, the topsoil previously stored will be returned to its original depth over the area.
- The area will be fertilised if necessary to allow vegetation to establish rapidly. The site will be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora, should natural vegetation not re-establish within 6 months from site closure.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a vegetation seed mix to their specification.

#### **5.4.2 Rehabilitation of plant area**

- The compacted areas will be ripped and the topsoil returned over the area.
- Coarse natural material used for the construction of ramps will be removed and dumped into the excavations.
- Stockpiles will be removed during the decommissioning phase, the area ripped and the topsoil returned to its original depth to provide a growth medium.
- On completion of operations, all structures or objects will be dealt with in accordance with Section 44 of the MPRDA, 2002 (Act 28 of 2002):
  - Where sites have been rendered devoid of vegetation/grass or soils have

been compacted owing to traffic, the surface will be scarified or ripped.

- The site will be seeded with a vegetation seed mix adapted to reflect the local indigenous flora if natural vegetation does not re-establish within 6 months of the closure of the site.
- Photographs of the mining area and office sites, before and during the mining operation and after rehabilitation, will be taken at selected fixed points and kept on record for the information of the Regional Manager.
- On completion of mining operations, the surface of these areas, if compacted due to hauling and dumping operations, will be scarified to a depth of at least 300 mm and graded to an even surface condition and the previously stored topsoil will be returned to its original depth over the area.
- Prior to replacing the topsoil the overburden material that was removed from these areas will be replaced in the same order as it originally occurred.
- The area shall then be fertilised if necessary to allow vegetation to establish rapidly. The site will be seeded with a local, adapted indigenous seed mix if natural vegetation does not re-establish within 6 months after site closure.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the Regional Manager may require that the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be seeded with a seed mix to their specification.

#### **5.4.3 Final rehabilitation**

- Rehabilitation of the surface area will entail landscaping, levelling, top dressing, land preparation, seeding (if required), maintenance, and weed/ alien clearing.
- All infrastructures, equipment, plant, temporary housing and other items used during the mining period will be removed from the site (section 44 of the MPRDA).
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried/burned on site.

- Weed/alien clearing will be done in a sporadic manner during the life of the mining activities.
- Species considered Category 1 weeds as per CARA, 1983 – Act 43, Regulations 15 & 16 (as amended in March 2001) must be eradicated from site.
- Final rehabilitation will be completed within a period specified by the Regional Manager.

### 5.5 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline

The calculation of the quantum for financial provision was according to Section B of the working manual.

#### 5.5.1 Mine type and saleable mineral by-product

According to Tables B.12, B.13 and B.14:

Mine type	PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore
Saleable mineral by-product	None

#### 5.5.2 Risk ranking

According to Tables B.12, B.13 and B.14:

Primary risk ranking (either Table B.12 or B.13)	C (Low risk)
Revised risk ranking (B.14)	N/A

#### 5.5.3 Environmental sensitivity of the mine area

According to Table B.4:

Environmental sensitivity of the mine area	Low
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#### 5.5.4 Level of information

According to Step 4.2:

Level of information available	Limited
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#### 5.5.5 Identify closure components

According to Table B.5 and site-specific conditions:

Component nr	Main description	Applicability of closure components
1	Dismantling of processing plant and related structures (including	No

	overland conveyors and power lines)		
2 (A)	Demolition of steel buildings and structures		No
2 (B)	Demolition of reinforced concrete buildings and structures		No
3	Rehabilitation of access roads		No
4 (A)	Demolition and rehabilitation of electrified railway lines		No
4 (B)	Demolition and rehabilitation of non-electrified railway lines		No
5	Demolition of housing and facilities		No
6	Opencast rehabilitation including final voids and ramps	Yes	
7	Sealing of shafts, adits and inclines		No
8 (A)	Rehabilitation of overburden and spoils	Yes	
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing)		No
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich)		No
9	Rehabilitation of subsided areas		No
10	General surface rehabilitation, including grassing of all denuded areas	Yes	
11	River diversions	Yes	
12	Fencing		No
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater)		No
14	2 to 3 years of maintenance and aftercare		No

## 5.6 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 or Financial and Technical Competence Report as the case may be.

The amount that will be necessary for the rehabilitation of damages caused by the operation, both sudden closures during the normal operation of the project and at final, planned closure gives a sum total of **R 1 092 338. 00**.

### CALCULATION OF THE QUANTUM



Applicant:  
Evaluator:

Khumbelo Makhado

DMRE REF: NW /30/5/1/1/3/ (10956)  
MP

Ref No.:  
Date:

Nov-21

No.	Description	Unit	A	B	C	D	E=A*B*C*D
			Quantity	Master Rate	Multiplication factor	Weighting factor 1	Amount (Rands)
1	Dismantling of processing plant and related structures (including overland conveyors and powerlines)	m3	0	17,14	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	238,71	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	351,79	1	1	0
3	Rehabilitation of access roads	m2	2800	42,72	1	1	119616
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	0	447,42	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	4,47	242 984,15	0,08	1	86891,13204
7	Sealing of shafts adits and inclines	m3	0	128,15	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,26	166 847,44	1	1	43380,3344
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	207 805,47	1	1	0
8 ( C )	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	603 565,59	1	1	0
9	Rehabilitation of subsided areas	ha	0,03	139 709,60	1	1	0
10	General surface rehabilitation	ha	5	132 171,31	0,8	1	528685,24
11	River diversions	ha	0	132 171,31	1	1	0
12	Fencing	m	0	150,77	1	1	0
13	Water management	ha	0	50 255,25	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	17 589,34	1	1	0
15 (A)	Specialist study	Sum	0	0	1	1	0
15 (B)	Specialist study	Sum	0	0	1	1	0
Sub Total 1							778572,7064
1	Preliminary and General		93428,72477		weighting factor 2 1		93428,72477
2	Contingencies			77857,27064			77857,27064
Subtotal 2							949858,70
VAT (15%)							142478,81
Grand Total							1092338

SIGN  
DATE

Khumbelo Makhado  
2021/11/18

## 5.7 Mechanisms for compliance monitoring against EMP

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including:

- a) Monitoring of Impact Management Actions
- b) Monitoring and reporting frequency
- c) Responsible persons
- d) Time period for implementing impact management actions
- e) Mechanisms for monitoring compliance

Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
<ul style="list-style-type: none"> <li>• Topsoil stripping and stockpiling</li> <li>• Free digging</li> <li>• Excavation</li> <li>• Crushing</li> <li>• Stockpiling and transporting</li> <li>• Sloping and landscaping during rehabilitation</li> </ul>	<p><b>Dust monitoring</b></p> <ul style="list-style-type: none"> <li>• The dust generated by the mining activities should be continuously monitored and addressed by the implementation of dust suppression methods.</li> </ul>	<p><b>Dust handling and monitoring</b></p> <ul style="list-style-type: none"> <li>• Dust suppression equipment, like a water car and water dispenser. The applicant already has this equipment available.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Control dust liberation into surrounding environment by using, e.g., water spraying and/or other dust-allaying agents.</li> <li>• Limit speed on access roads to 40km/h to prevent excess dust generation.</li> <li>• Spray roads with water/environmentally-friendly dust allaying agent that contains no PCBs (e.g. DAS products) if dust is generated above acceptable limits.</li> <li>• Assess effectiveness of dust suppression equipment.</li> <li>• Re-vegetate all disturbed/exposed areas as soon as possible to prevent any dust source from being created.</li> <li>• Ensure the crusher is equipped with water sprayers.</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>

Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
<ul style="list-style-type: none"> <li>• Topsoil stripping and stockpiling</li> <li>• Free digging</li> <li>• Excavation</li> <li>• Crushing</li> <li>• Sloping and landscaping during rehabilitation</li> </ul>	<p><b>Noise monitoring</b></p> <ul style="list-style-type: none"> <li>• The noise generated by the mining activities should be continuously monitored, and any excessive noise should be addressed.</li> </ul>	<p><b>Noise handling and monitoring</b></p> <ul style="list-style-type: none"> <li>• Site manager to ensure that the vehicles are equipped with silencers and kept roadworthy.</li> <li>• Compliance with the appropriate legislation with respect to noise will be mandatory.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Ensure that staff conduct themselves in an acceptable manner while on site.</li> <li>• No loud music permitted at mining area.</li> <li>• Ensure that all mining vehicles are equipped with silencers and kept roadworthy in terms of the Road Transport Act.</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>
<ul style="list-style-type: none"> <li>• Topsoil stripping and stockpiling</li> <li>• Excavation</li> <li>• Stockpiling and transporting</li> </ul>	<p><b>Management of weed or invader plants</b></p> <ul style="list-style-type: none"> <li>• The presence of weed and/or invader plants should be continuously monitored, and any unwanted plants should be removed.</li> </ul>	<p><b>Management of weed or invader plants</b></p> <ul style="list-style-type: none"> <li>• Removal of weeds should be manually or by the use of an approved herbicide</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Implement a weed and invader plant control management plan.</li> <li>• Control declared invader or exotic species on the rehabilitated areas.</li> <li>• Keep the temporary topsoil stockpiles free of weeds.</li> </ul>	<p>Throughout operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer.</li> </ul>
<ul style="list-style-type: none"> <li>• Stockpiling and transporting</li> <li>• Sloping and Landscaping during rehabilitation</li> </ul>	<p><b>Surface and storm water monitoring</b></p> <ul style="list-style-type: none"> <li>• The effectiveness of the storm water infrastructure needs to be continuously monitored.</li> </ul>	<p><b>Surface and storm water handling</b></p> <ul style="list-style-type: none"> <li>• Trenches and contours to be made to direct storm- and runoff water around the</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines. Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Divert storm water around topsoil heaps, stockpile areas and access roads to prevent erosion and material loss.</li> </ul>	



Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
		stockpile areas.	<ul style="list-style-type: none"> <li>• Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas.</li> <li>• Conduct mining in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the DWS, and any other conditions the DWS may impose.</li> </ul>	
<ul style="list-style-type: none"> <li>• Free digging</li> <li>• Excavation</li> <li>• Sloping and Landscaping during rehabilitation</li> </ul>	<p><b>Management of health and safety</b></p> <ul style="list-style-type: none"> <li>• All health and safety aspects need to be monitored on a daily basis.</li> </ul>	<p><b>Management of health and safety risks</b></p> <ul style="list-style-type: none"> <li>• Site manager to ensure that workers are equipped with required PPE while operating on site.</li> <li>• The necessary warning signs must be present at the site to inform the public and workers of mining activities.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Submit an application for approval of access onto the R to the Department of Roads and Public Works prior to the commencement of work.</li> <li>• Inform the Traffic Department of each blast. If necessary, arrange for temporary road closure during a blast.</li> <li>• Limit fly rock.</li> <li>• Give audible warning of a pending blast at least 3 minutes before the blast.</li> <li>• Remove all fly rock (diameter 150mm and larger) which falls beyond working area, together with the rock spill.</li> <li>• Ensure that workers have access to the correct PPE as required by law.</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer</li> </ul>

Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
<ul style="list-style-type: none"> <li>• Excavation</li> <li>• Crushing stockpiling and transporting</li> <li>• Sloping and landscaping during rehabilitation</li> </ul>	<p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Management of waste should be a daily monitoring activity.</li> <li>• Hydrocarbon spills need to be cleaned immediately and the site manager should check compliance daily.</li> </ul>	<p><b>Waste management</b></p> <ul style="list-style-type: none"> <li>• Closed containers for the storage of general/hazardous waste until waste is removed to the appropriate landfill site.</li> <li>• Hydrocarbon spill kits to enable sufficient clean-up of contaminated areas.</li> <li>• Drip trays should be available to place underneath haul vehicles while the vehicles are parked at night.</li> <li>• Should a vehicle have a break down, it should be serviced immediately.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines. Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Ensure that vehicle repairs only take place in the service bay area and all waste products are disposed of in a 200 L closed container/bin inside the emergency service area.</li> <li>• Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and remove from site, for resale or appropriate disposal at a recognised facility.</li> <li>• Clean spills immediately to the satisfaction of the Regional Manager by removing the spillage and polluted soil and by disposing of them at a recognised facility.</li> <li>• Ensure availability of suitable covered, conveniently placed receptacles at all times for waste disposal.</li> <li>• Place all used oils, grease or hydraulic fluids therein and remove receptacles from site regularly for disposal at a registered/licensed hazardous disposal facility.</li> <li>• Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection should take place regularly and disposed of at the recognised landfill site at Bapong . Prevent refuse from being dumped on or in the vicinity of the mine area.</li> <li>• Biodegradable refuse to be handled as indicated above.</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>

Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
Stockpiling and transporting	<p><b>Management of access roads</b></p> <ul style="list-style-type: none"> <li>• Access road conditions must be continuously monitored.</li> <li>• Vehicles carrying materials has to be equipped with adequate tarpaulin type covers to ensure that material being transported will not leave the vehicle during transportation.</li> </ul>	<p><b>Management of access roads</b></p> <ul style="list-style-type: none"> <li>• Dust suppression equipment such as a water car and dispenser.</li> <li>• Trenches and contours to be made to direct storm- and runoff water around the access roads.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Maintain newly constructed access roads (if applicable) to minimise dust, erosion or undue surface damage.</li> <li>• Divert storm water around access roads to prevent erosion.</li> <li>• Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas.</li> <li>• Cover vehicles carrying materials with adequate tarpaulin type covers to ensure that material being transported does leave the vehicle during transportation.</li> <li>• Ensure vehicles entering and using the public road system from the site does not exceed the permissible legal limits on gross vehicle mass and individual axle loads as prescribed in terms of the National Road Traffic Act (Act No 93 of 1996).</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>
Topsoil stripping and stockpiling	<p><b>Topsoil handling</b></p> <ul style="list-style-type: none"> <li>• When topsoil has been removed from any area the topsoil heaps need to be continuously protected against loss of soil due to wind and water erosion.</li> </ul>	<p><b>Topsoil handling</b></p> <ul style="list-style-type: none"> <li>• Excavating equipment to remove the first 300mm of topsoil from the proposed work areas. The applicant already has this equipment available.</li> </ul>	<p><b>Role</b></p> <ul style="list-style-type: none"> <li>• Site Manager to ensure compliance with EMPr guidelines.</li> <li>• Compliance to be monitored by the Environmental Control Officer.</li> </ul> <p><b>Responsibility</b></p> <ul style="list-style-type: none"> <li>• Remove the first 300mm of topsoil in strips and store at the stockpile area.</li> <li>• Keep the temporary topsoil stockpiles free of weeds.</li> <li>• Place topsoil stockpiles on a levelled area and implement measures to safeguard the piles from being</li> </ul>	<p>Throughout construction, operational and decommissioning phase</p> <ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management.</li> <li>• Quarterly compliance monitoring of site by an</li> <li>• Environmental Control Officer.</li> </ul>

Source activity	Impacts required monitoring program	Functional requirements for monitoring	Roles and responsibilities for the execution of monitoring program	Monitoring and reporting frequency and time periods for implementing impact management actions
		<ul style="list-style-type: none"> <li>Trenches and contours to be made to direct storm and runoff water around stockpiled topsoil area.</li> </ul>	<p>washed away in the event of heavy rains/storm water.</p> <ul style="list-style-type: none"> <li>Topsoil heaps should not exceed 2 m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen.</li> <li>Divert storm- and runoff water around the stockpile area and access roads to prevent erosion.</li> </ul>	

## 5.8 Indicate frequency of the submission of the performance assessment/ environmental audit report

The committed time frames for monitoring and reporting are stipulated in the following:

Monitoring aspect	Time frames	Reporting
Dust handling	Throughout construction, operational and decommissioning phase	<ul style="list-style-type: none"> <li>• Daily compliance monitoring by site management</li> </ul>
Noise handling		
Management of weed/invader plants	Throughout operational and decommissioning phase	<ul style="list-style-type: none"> <li>• Quarterly compliance monitoring of site by an Environmental Control Officer</li> </ul>
Surface and storm water handling		
Management of health and safety risks	Throughout construction, operational and decommissioning phase	
Waste management		
Management of access roads		
Topsoil handling		

It is proposed that the performance assessment/environmental audit report be quarterly submitted to DMRE.

## 5.9 Environmental Awareness Plan

### 5.9.1 Manner in which the applicant intends to inform employees of any environmental risk which may result from their work

Training, as detailed below, will address the specific measures and actions required for specific emergency events. In this way, each employee will be provided the knowledge required for their job to, firstly, prevent impact and secondly identify if an impact is likely to occur and then to report the possibility of risk or impact immediately so as to ensure immediate response. The most likely potential environmental emergencies in this proposed mining operation are fires and explosion, chemical spills/leaks, and flooding. In the case of environmental emergencies, the remedial measures and actions as listed in the Emergency Response Plan should be followed, in addition the following relevant authorities should be contacted:

#### Dept. of Water Affairs

Private Bag X352

Hartbeespoort

0216

Tel: 012 253 1026

Fax: 012 253 1905

Email: [WarmsEnquiries@dws.gov.za](mailto:WarmsEnquiries@dws.gov.za)

**Dept. of Mineral Resources**

Vaal University of Technology Building, c/o  
Voortrekker & Margaretha Orinsloo Streets  
Klerksdorp  
2570

Tel: 018 487 9830

Fax: 018 462 9039

**Rustenburg Fire Department**

152 Bethlehem Street  
Rustenburg  
0300

Tel: 014 590 3232

**5.9.1.1 Fire and explosion control measures**

Hazardous waste and dangerous substances can, by the verify definition, be flammable and reactive. As such, special precautionary measures must be taken when handling these substances. On the other hand, veld fires and fires resulting from other sources must be handled with extreme caution. In the event of a fire:

- Fire extinguishers must be placed around the mine at accessible locations and needs to be frequently inspected and maintained in working condition.
- An alarm must be activated to alert all employees and contractors.
- Identify the type of fire and the appropriate extinguishing material. E.g., water for a grass fire and mono ammonium phosphate based fire extinguisher for chemical and electrical fires
- In the event of a small fire, the fire extinguishers placed around the mine should be used to contain and extinguish the fire.
- In the event of a large fire, the fire department will be notified.
- All staff will receive training in response to a fire emergency on site, including evacuation procedures.

- A Fire Association should be set up with the mine and surrounding land owners (especially other mining permits and major collieries in close proximity) to facilitate communication during fire events and assist in fighting fires, where necessary. If such an association exists, the mine will join it.
- If possible, surrounding drains, such as storm water drains must be covered and/or protected to prevent any contaminated water from entering the drains.
- In case of a chemical or petroleum fire, run-off from the area must be contained as far as possible using the most appropriate measures, e.g. spill absorbent cushions, sand or a physical barrier.
- Contaminated run-off must be diverted into an oil sump or cleaned up.

Control measures include:

- Minimizing the storage of flammable liquids on site (e.g. fuel, flammable wastes)
- Using a nitrogen atmosphere for organic waste liquid with a low flashpoint stored in tanks
- Not allowing smoking anywhere on site
- Providing an emergency tipping area for waste loads identified to be on fire or otherwise deemed an immediate risk
- Preparing and annually reviewing a fire risk assessment
- Ensuring all staff are appropriately trained for fire and explosion hazards

Other than explosion incidents related to mining, explosions can occur in the workshop areas when working with gas cylinders and chemicals. These could result in large numbers of employees being injured and requiring medical assistance.

The procedure to be followed includes:

- Devising safe evacuation routes in the event of an uncontrolled explosion and all staff trained on relevant evacuation routes and assembly points.
- Providing first aid to injured parties, once safe to do so for first responders.
- Notifying relevant emergency response units and hospitals of incoming patients.
- Notifying the DMRE of the incident.

#### **5.9.1.2 Chemical spills**

Hydrocarbons such as diesel, petrol, and oil used as fuel for mine machinery will be kept

on site, meaning that spillage may occur. As this is a PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore mine there is also the possibility of a PGMs, Chrome ore, Copper, Nickel ore , Vanadium ore and Iron ore spillage occurring. Any chemicals contained on site, such as those associated with explosives may also be detrimental to the environment if spills occur. In the event of a spillage, procedures must be put into place to ensure that there are minimal impacts to the surrounding environment.

The following procedure applies to a chemical spill:

- The incident must be reported to the SHE officer(s) immediately.
- The SHE officer will assess the situation from the information provided, and set up an investigation team. Included in this team could be the General Mine Manager, SHE Officer, the employee who reported the incident and an individual responsible for the incident.
- When investigating the incident, priority must be given to safety.
- Once the situation has been assessed, the Environmental Coordinator must report back to the Mine Manager.
- The General Mine Manager and the investigation team must make a decision on what measures can be taken to limit the damage caused by the incident, and if possible, any remediation measures that can be taken.
- In the event of a small spillage, the soil must be treated in situ, using Hazmat clean up kits and bioremediation.
- Every precaution must be taken to prevent the spill from entering the surface water environment.
- In the event of a large spillage, adequate emergency equipment for spill containment or collection, such as additional supplies of booms and absorbent materials, will be made available and if required, a specialized clean-up crew will be called in to decontaminate the area. The soil must be removed and treated at a special soil rehabilitation facility.
- Reasonable measures must be taken to stop the spread of spills and secure the area to limit access.

### **5.9.1.3 Flooding**

There is always potential for flooding during the rainy season. This could result in a large volume of water accumulating in a water containment facility, which could cause



major damage to equipment and endanger the lives of employees on site. Procedures must be put in place to ensure a quick response to flood events and minimal damage.

The procedure for flooding is as follows:

- During operations, DWS's flood warning system must be reviewed annually.
- The use of emergency pumps must occur if the water floods the pit.
- Mine management must be made aware of any such event so they can take appropriate action to ensure minimal production losses.
- The Pollution Control Dam should have a 0.8m freeboard and an overflow or outlet to ensure that no damage occurs to the facilities.
- All contaminated water must be contained on site, as far as possible and discharges to the environment must only occur if necessary in an extreme flood event.

## **6 Manner in which risk will be dealt with to avoid pollution or environmental degradation**

### **6.1 Training (educational needs)**

The Safety, Health and Environment (SHE) Officer must ensure that:

- New employees attend environmental awareness programmes through inductions
- Mine management conducts bi-annual workshops
- Documented training and competency
- Training records be maintained
- Training includes proper management of waste streams, labelling, containers and emergency procedures outlined
- Hazardous waste handlers and their supervisors/managers must complete training or on-the-job instruction relevant to their duties to include hazardous waste management procedures and contingency plan implementation
- Training of all personnel must be completed before duties are assigned and training in terms of handling of hazardous waste must be repeated annually and as and when required

### **6.2 Outsourced specialist skills**

A training department will be established on site during operations. All inductions and workshops will be hosted by this department. This department, in conjunction with the SHE Officer, is responsible for ensuring job-specific training for personnel performing tasks, which can cause significant environmental (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.). The General Mine Manager (GM) with the assistance of the SHE Officer must identify relevant personnel and training courses. Short courses such as First aid training, Level 1 and 2; Fire Fighting Level; safety representative training; etc. should be mandatory and sourced from the training providers,

### **6.3 Review and updating of training manual and course layout**

Before implementing the emergency and response plans and other environmental standard operating procedure, the SHE Coordinator and GM/Supervisors will designate

and train a sufficient number of persons to assist in the safe and orderly emergency evacuation of employees.

All training manual and courses must be reviewed with all employees at the following times:

- Initially when the plan is developed,
- Whenever the employee's responsibilities or designated action under the plan change, and whenever the plan or mining processes has changed.
- At least annually employee meetings are to be held to train employees of the contents of the EP&RP and revise the plan as appropriate.
- Drills will be conducted and full participation encouraged.
- All training must be documented in writing and copies sent to GM.

Effectiveness of the environmental management training will be done by management through task observations and during internal and external audits. All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organisational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed; any shortcomings and non-compliance will be highlighted and management measures incorporated or improved upon within the training material.

#### **6.4 Records**

The mine will keep records such as waste, water, electricity usage etc. Record of incoming and outgoing waste must be kept and these must include:

- Types and categories of incoming and outgoing waste
- Quantities of each waste type and category
- Transporter details
- Safe disposal certificate must always be returned and filed at waste disposal site
- Training records for all employees working on the hazardous waste facility
- All records must be computerised or legible paper trails and cross-referenced, waste tracking easily accessed
- Records must be kept in a database on site for 3 years or more

Records from the implementation of this EAP will be kept and controlled in accordance

with the SHE Management System Control of Records Procedure of the mine, which is required to be implemented so as to provide evidence of conformity and effective operation of the relevant requirements of the SHE management system.

### **6.5 Environmental awareness notice boards**

The following basic environmental education material will be posted on a monthly basis on accessible notice boards on mine premises, one topic will be selected each month:

## WHAT IS THE ENVIRONMENT?

- Soil
- Water
- Plants
- People
- Animals
- Air we breathe
- Buildings, cars and houses



## WHY MUST WE LOOK AFTER THE ENVIRONMENT?

- It affects us all as well as future generations
- We have a right to a healthy environment
- A contract has been signed
- Disciplinary action (e.g. construction could stop or fines issued)

### ANIMALS

- Do not injure or kill any animals on the site
- Ask your supervisor or Contract's Manager to remove animals found on site



### TREES AND FLOWERS

- Do not damage or cut down any trees or plants without permission
- Do not pick flowers



### SMOKING AND FIRE

- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Do not light any fires without permission
- Know the positions of fire fighting equipment
- Report all fires
- Do not burn rubbish or vegetation without permission



### PETROL, OIL AND DIESEL

- Work with petrol, oil & diesel in marked areas
- Report any petrol, oil & diesel leaks or spills to your supervisor
- Use a drip tray under vehicles & machinery
- Empty drip trays after rain & throw away where instructed



### DUST

- Try to avoid producing dust -
- Use water to make ground & soil wet



### NOISE

- Do not make loud noises around the site, especially near schools and homes
- Report or repair noisy vehicles



### TRUCKS AND DRIVING

- Always keep to the speed limit
- Drivers - check & report leaks and vehicles that belch smoke
- Ensure loads are secure & do not spill



### RUBBISH

- Do not litter - put all rubbish (especially cement bags) into the bins provided
- Report full bins to your supervisor
- The responsible person should empty bins regularly



### EATING

- Only eat in demarcated eating areas
- Never eat near a river or stream
- Put packaging & leftover food into rubbish bins



### TOILETS

- Use the toilets provided
- Report full or leaking toilets





The operations manager must ensure that they understand the EMP document, its requirements and commitments before any mining takes place. An Environmental Control Officer must ensure compliance of mining activities to the management programmes described in the EMP. The following list represents the basic steps towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks.

#### 6.5.1 Site management

- Stay within site boundaries – do not enter adjacent properties
- Keep tools and material properly stored
- Smoke only in designated areas
- Use toilets provided – report full or leaking toilets

#### 6.5.2 Water management and erosion

- Check that rainwater flows around work areas and is not contaminated
- Report any erosion
- Check that dirty water is kept from clean water
- Do not swim in or drink from streams

#### 6.5.3 Waste management

- Take care of your own waste
- Keep waste separate into labelled containers – report full bins
- Place waste in containers and always close lid

- Don't burn waste
- Pick-up any litter laying around

#### **6.5.4 Hazardous waste management (petrol, oil, diesel, grease)**

- Never mix general waste with hazardous waste
- Use only sealed, non-leaking containers
- Keep all containers closed and store only in approved areas
- Always put drip trays under vehicles and machinery
- Empty drip trays after rain
- Stop leaks and spills, if safe
- Keep spilled liquids moving away
- Immediately report the spill to the site manager/supervision
- Locate spill kit/supplies and use to clean-up, if safe
- Place spill clean-up wastes in proper containers
- Label containers and move to approved storage area

#### **6.5.5 Discoveries**

- Stop work immediately
- Notify site manager/supervisor
- Includes archaeological finds, cultural artefacts, contaminated water, pipes, containers, tanks and drums, any buried structures

#### **6.5.6 Air quality**

- Wear protection when working in dusty areas
- Implement dust control measures:
  - Sweep paved roads
  - Water all roads and work areas
  - Minimise handling of material
  - Obey speed limit and cover trucks

### **6.5.7 Driving and noise**

- Use only approved access roads
- Respect speed limits
- Only use turn-around areas – no crisscrossing through undisturbed areas
- Avoid unnecessary loud noises
- Report or repair noisy vehicles

### **6.5.8 Vegetation and animal life**

- Do not remove any plants or trees without approval of the site manager
- Do not collect fire wood
- Do not catch, kill, harm, sell or play with any animal, reptile, bird or amphibian on site
- Report any animal trapped in the work area
- Do not set snares or raid nests for eggs or young

### **6.5.9 Fire management**

- Do not light any fires on site, unless contained in a drum at demarcated area
- Put cigarette butts in a rubbish bin
- Do not smoke near gas, paints or petrol
- Know the position of firefighting equipment
- Report all fires
- Don't burn waste or vegetation

## **6.6 Specific information required by the Competent Authority**

Among others, confirm that the financial provision will be reviewed annually.

The applicant undertakes to annually review and update the financial provision calculation, upon which it will be submitted to DMR for review and approved as sufficient to cover the environmental liability at the time and for closure of the mine at that time.



## 7 Undertaking

The EAP herewith confirms

- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs
- the inclusion of inputs and recommendations from the specialist reports where relevant
- that the information provided by the EAP to I&APs and any response of the EAP to comments or inputs made by I&APs are correctly reflected herein

---

**Signature of the Environmental Assessment Practitioner**

Singo Consulting (Pty) Limited

---

**Name of company**

---

**Date**

**-END-**

## **APPENDIX 1: CV & QUALIFICATION OF THE EAP**

Due to POPI Act sensitive information will not be disclosed to the public.

## APPENDIX 2: COMPETENT AUTHORITY LETTER(S)

---



mineral resources  
& energy

Department:  
Minerals Resources and Energy  
REPUBLIC OF SOUTH AFRICA

Private Bag A1, KLERKSDORP 2570

Fax No: (018) 487 4384 / Tel No.: (018) 487 4300

Enquiries: J.H Makhubela Reference No. NW 30/5/13/2/10956 MP

**Jaments Enterprises (Pty) Ltd**  
Private Bag X7297  
Highveld Mall  
**EMLAHLENI (WITBANK)**  
1035

Fax: 086 514 4103

E-mail Address: [kenneth@singo.co.za](mailto:kenneth@singo.co.za)

Attention: Ndinanyi Kenneth Singo

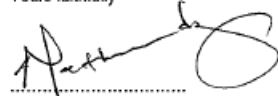
**ACCEPTANCE OF AN APPLICATION FOR A MINING PERMIT IN TERMS OF SECTION 27 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, ACT 28 OF 2002, AS AMENDED BY SECTION 23 OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT AMENDMENT ACT, ACT 49 OF 2008 "HEREIN REFERRED TO AS THE AMENDED ACT": PORTION OF THE REMAINING EXTENT OF THE FARM BULTFONTEIN 204 JP; SITUATED IN THE MAGISTERIAL DISTRICT OF BRITS.**

I hereby confirm that your application for a mining permit to mine for **chrome ore, platinum group metals, copper, nickel ore, vanadium ore and iron ore** in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) (as amended) has been accepted in terms of section 9(1)(b) of the Act.

As your application for a mining permit is the subject of a prior application over the same land and same mineral it is now third in line, your application will be held in abeyance in terms of section 9(1)(b) of the Act, until such time as the application preceding yours has been dealt with to finality.

Should you decide to withdraw your application, you are requested to inform the Regional Manager within 30 days from the date of signature of this letter.

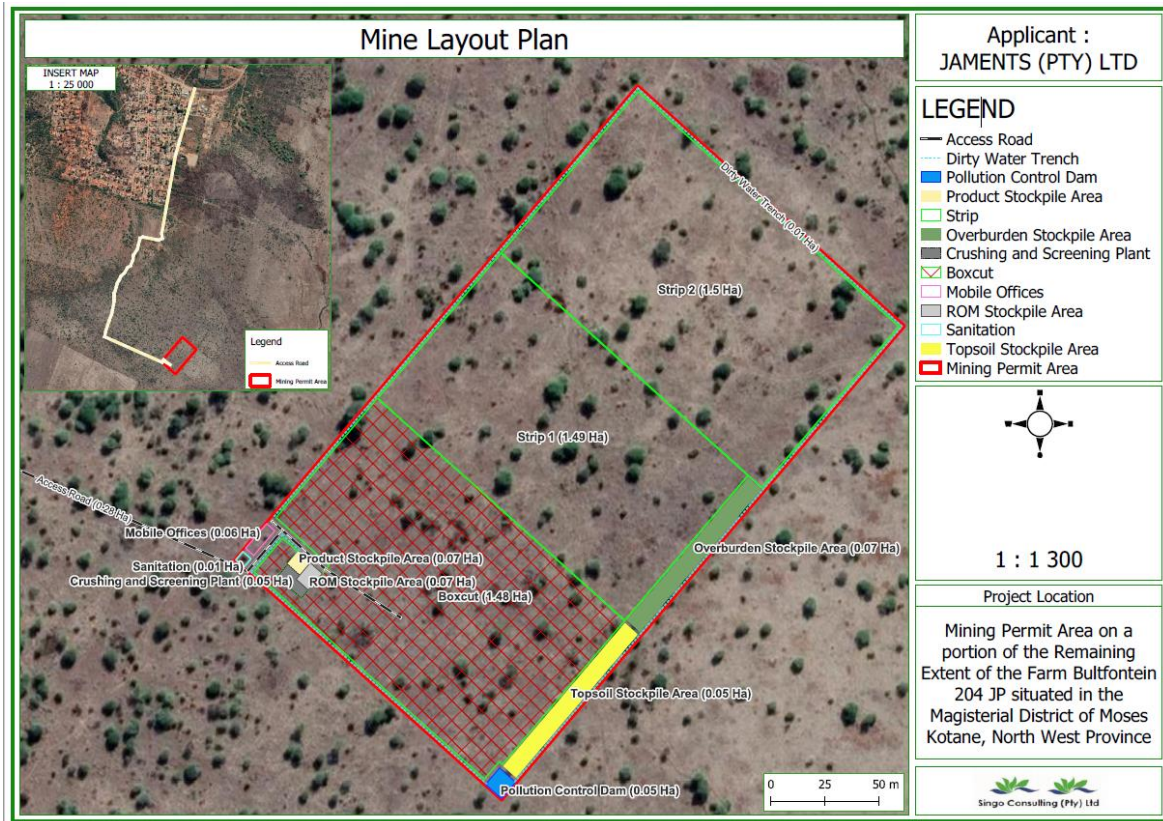
Yours faithfully

A handwritten signature in black ink, appearing to be 'A. P. ...', written over a horizontal dotted line.

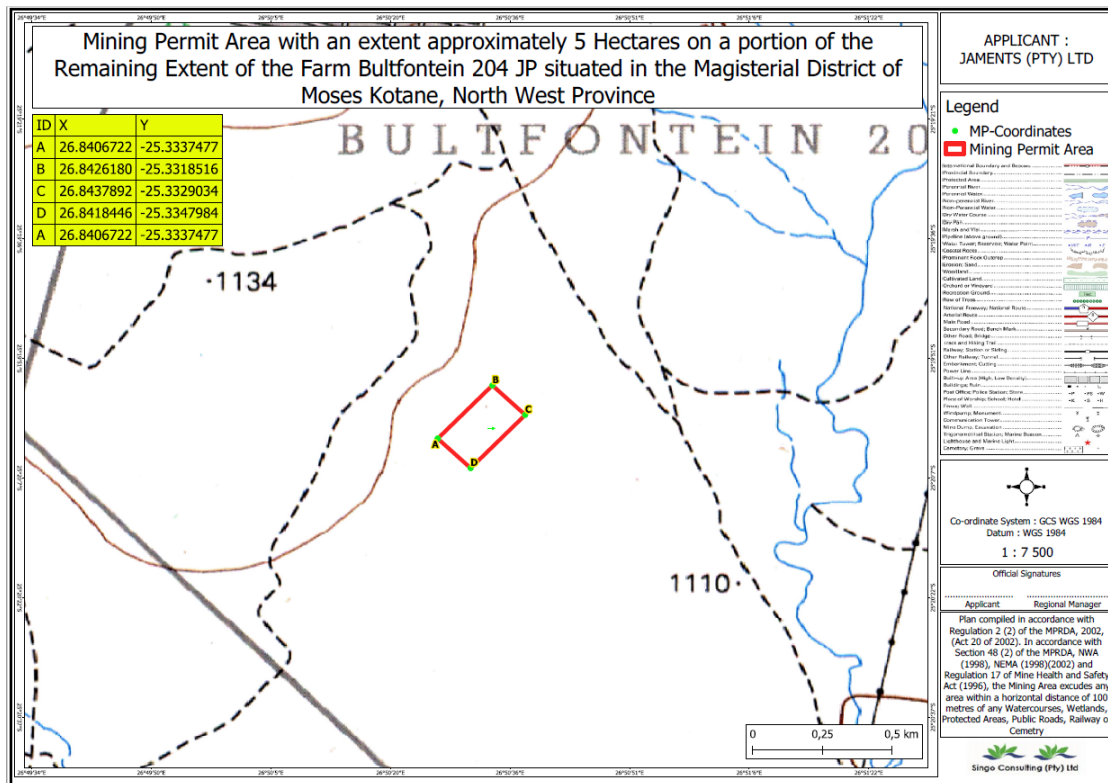
REGIONAL MANAGER  
NORTH WEST REGION

DATE: 14/10/2021

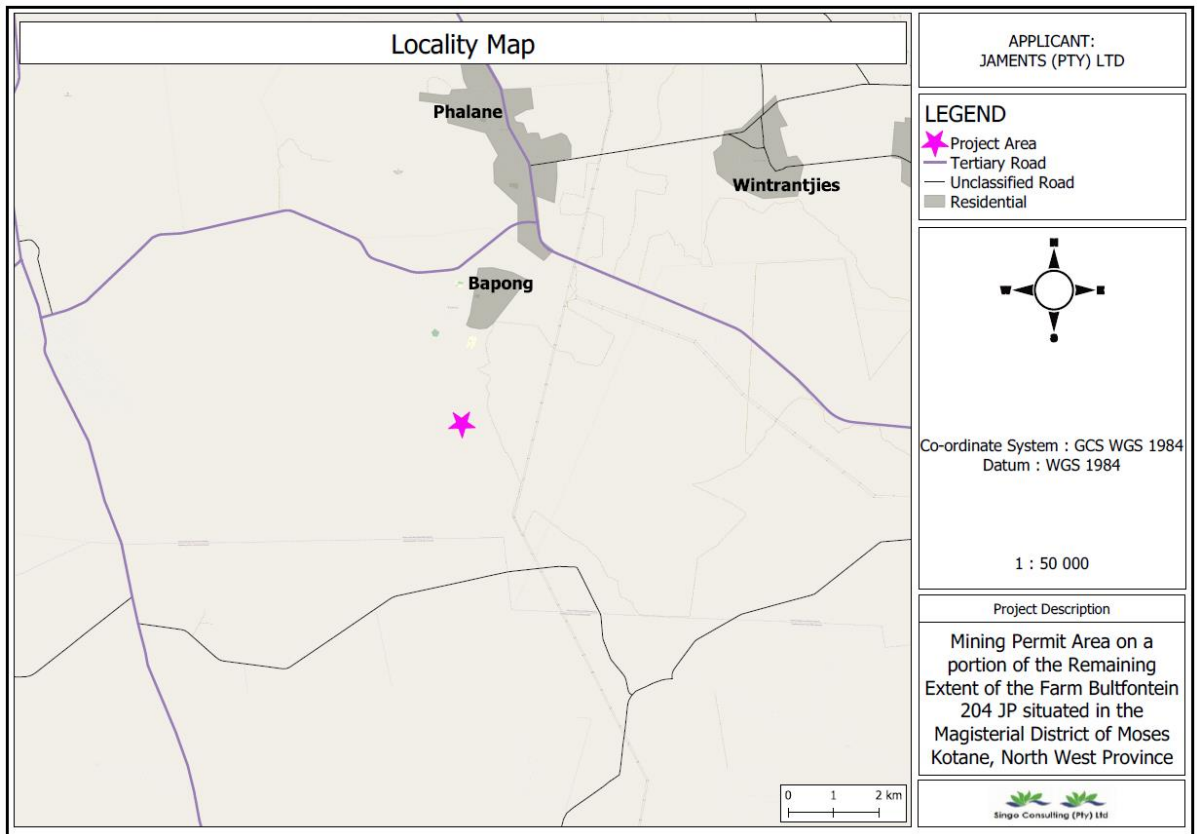
# APPENDIX 3 : PROJECT MAPS



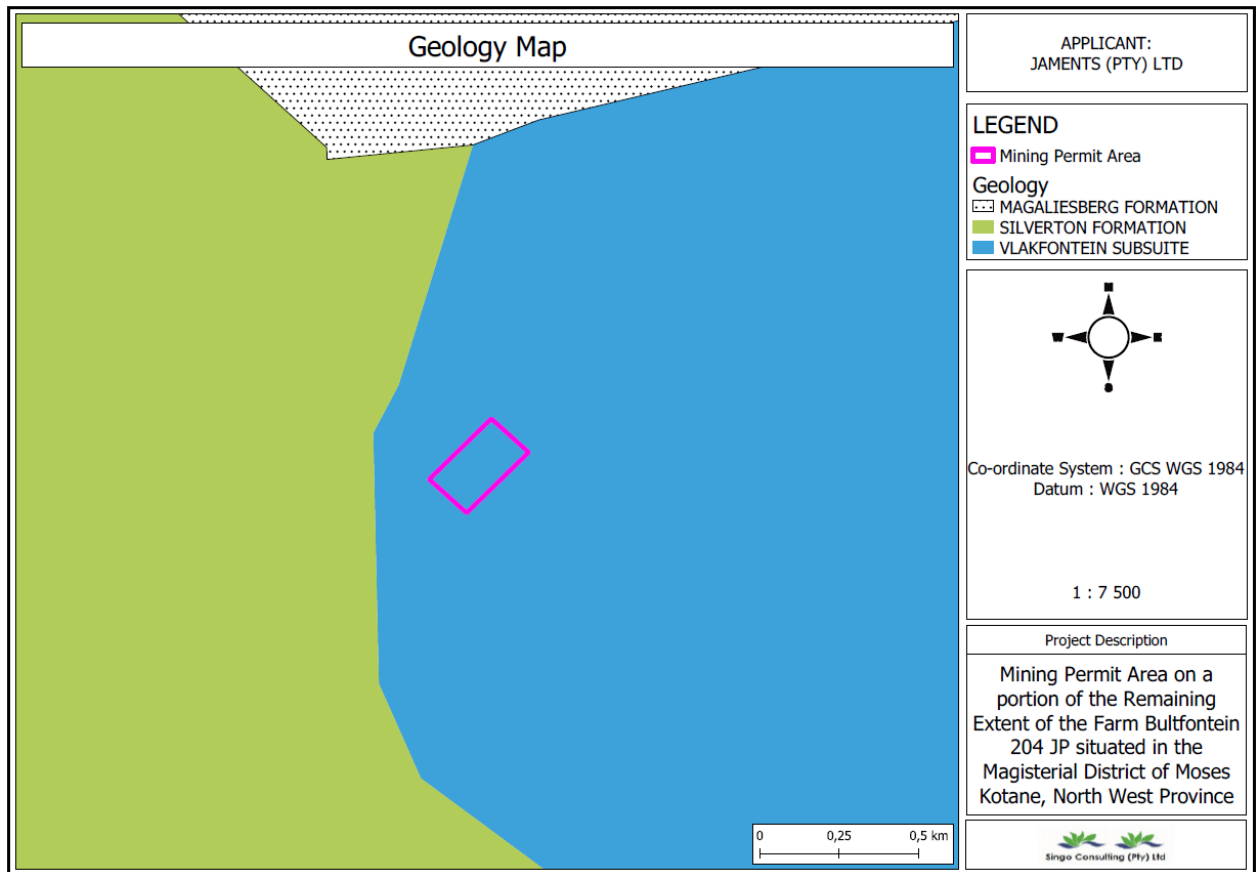
Mine Layout Plan



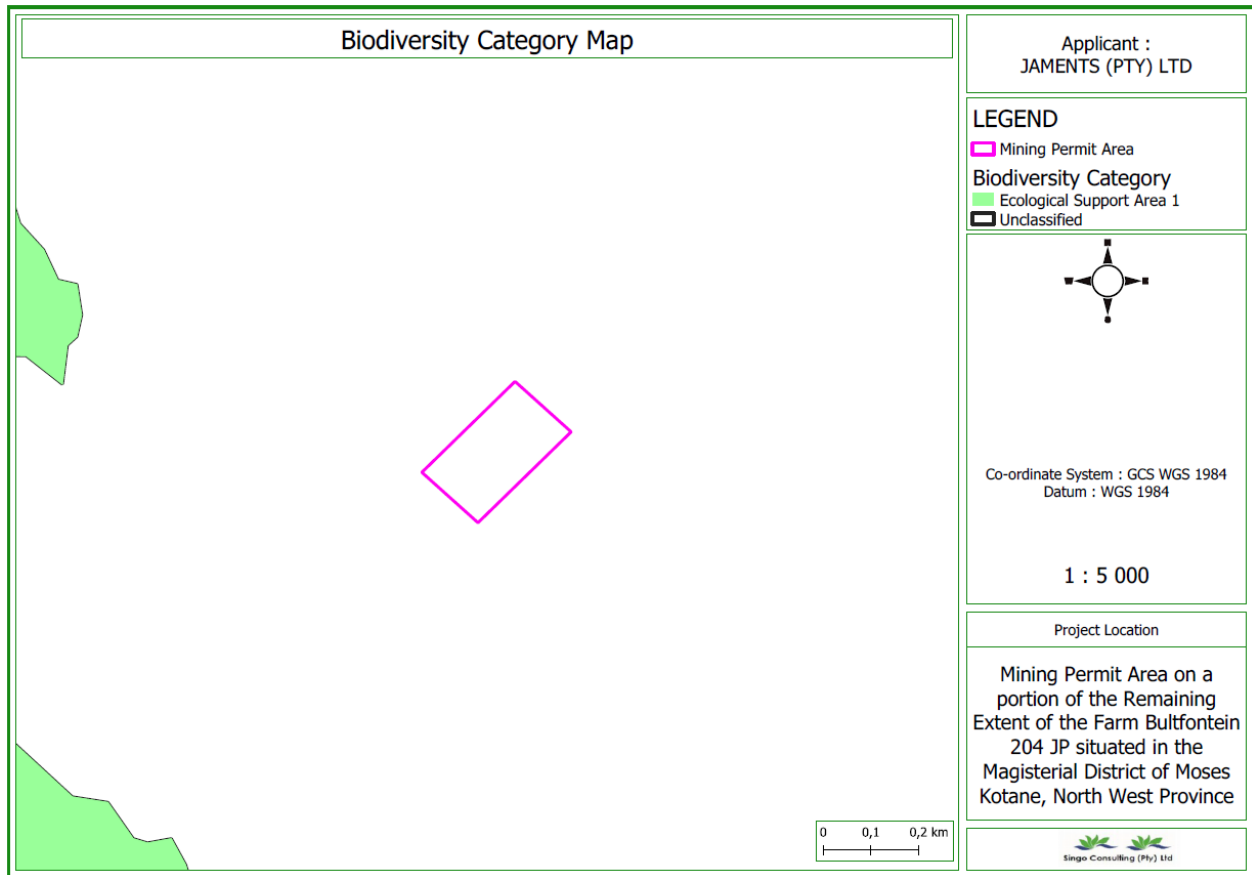
Regulation Map.



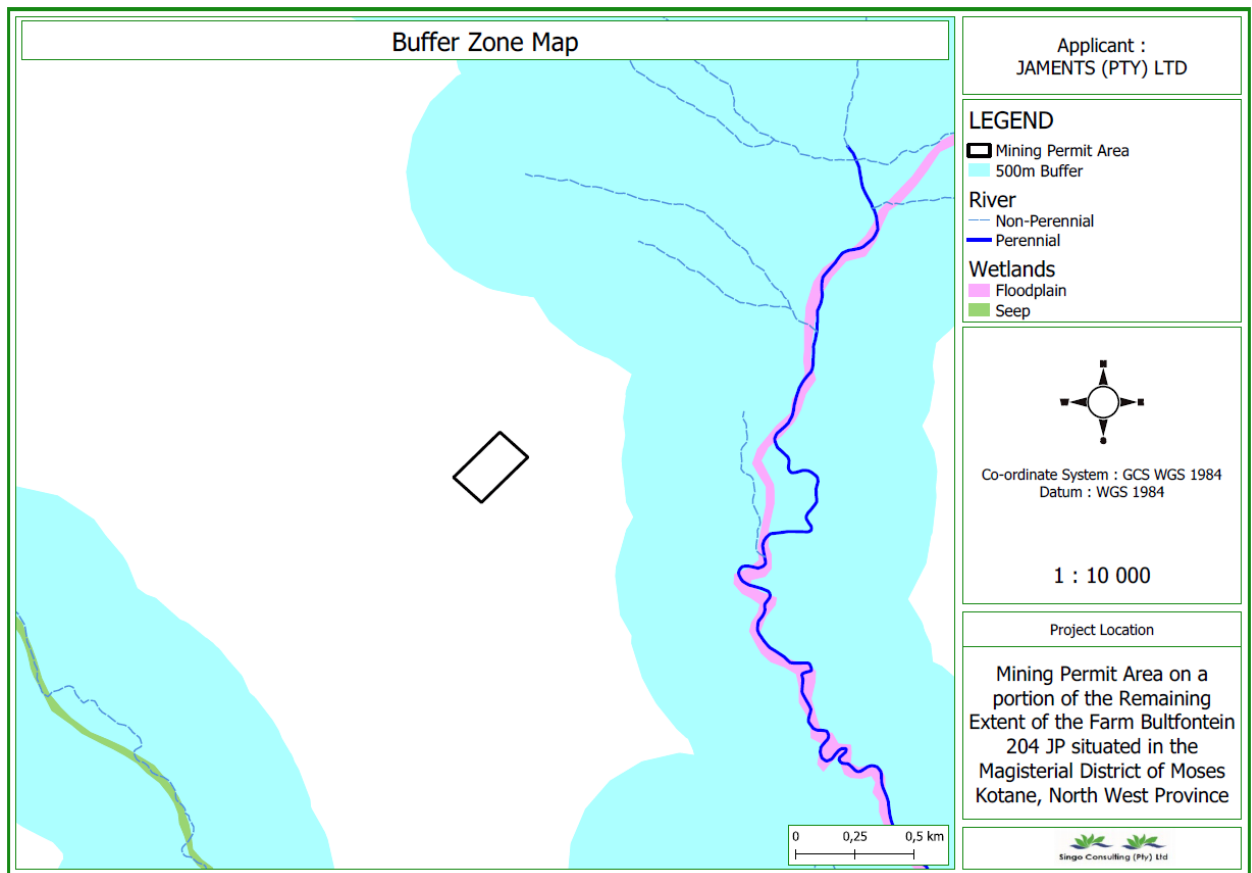
**Locality Map.**



**Geology Map.**

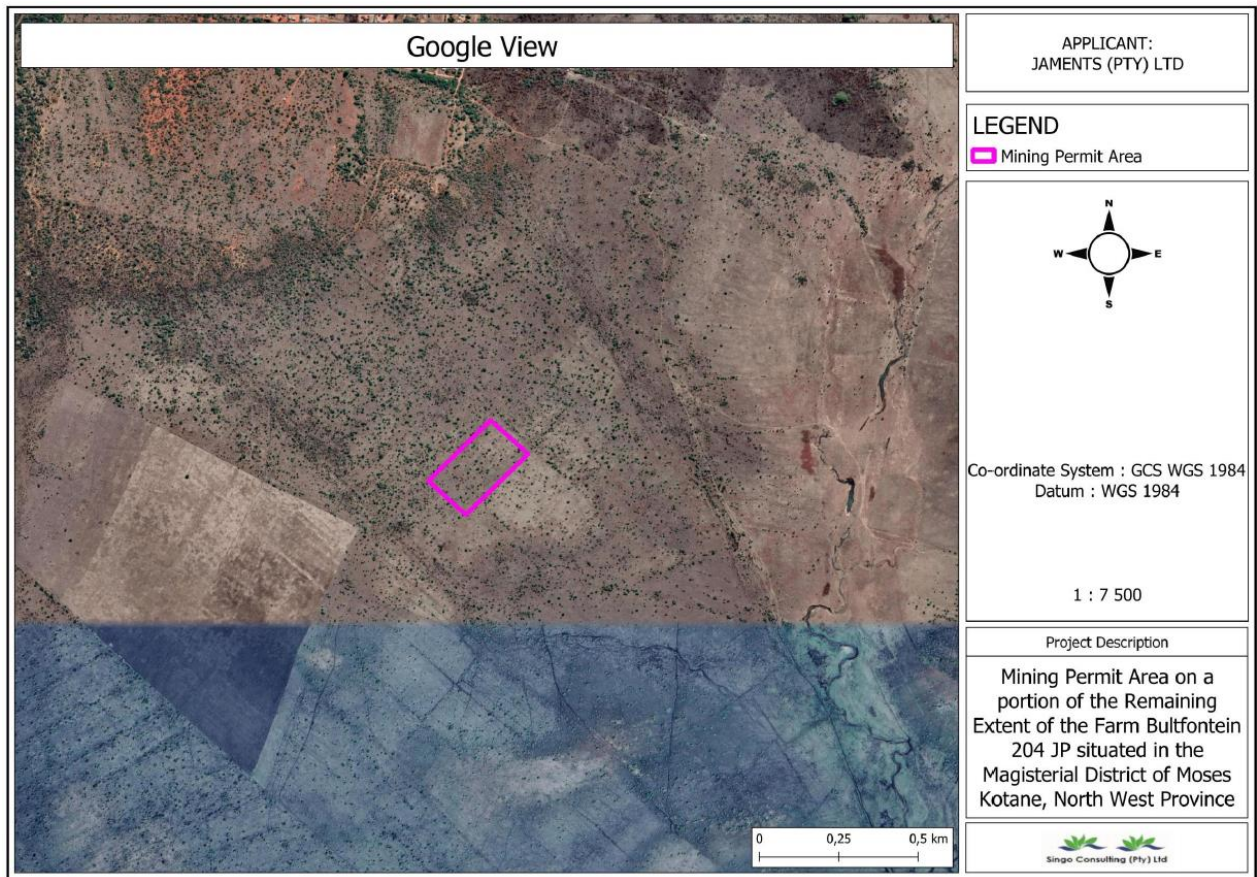


**Biodiversity Map.**

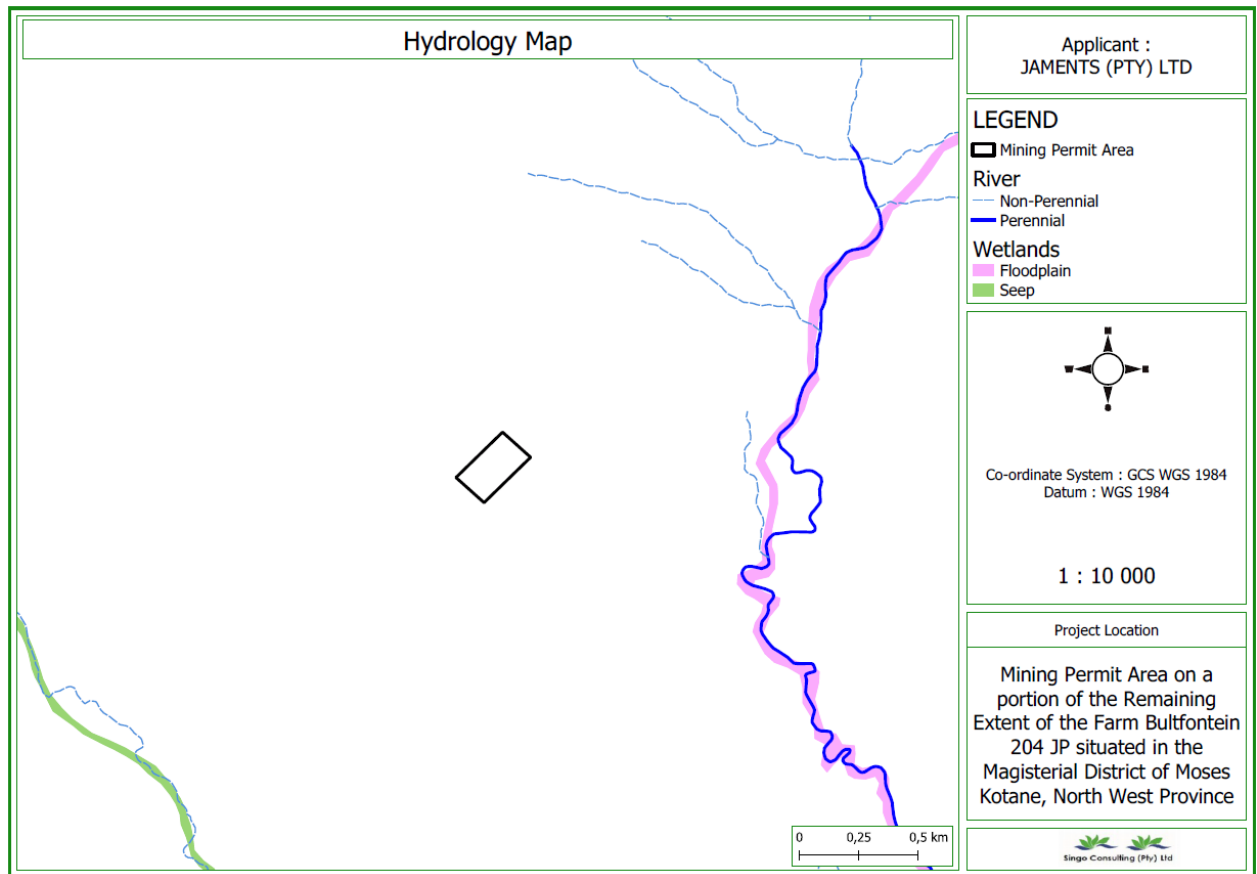


**Buffer Map.**



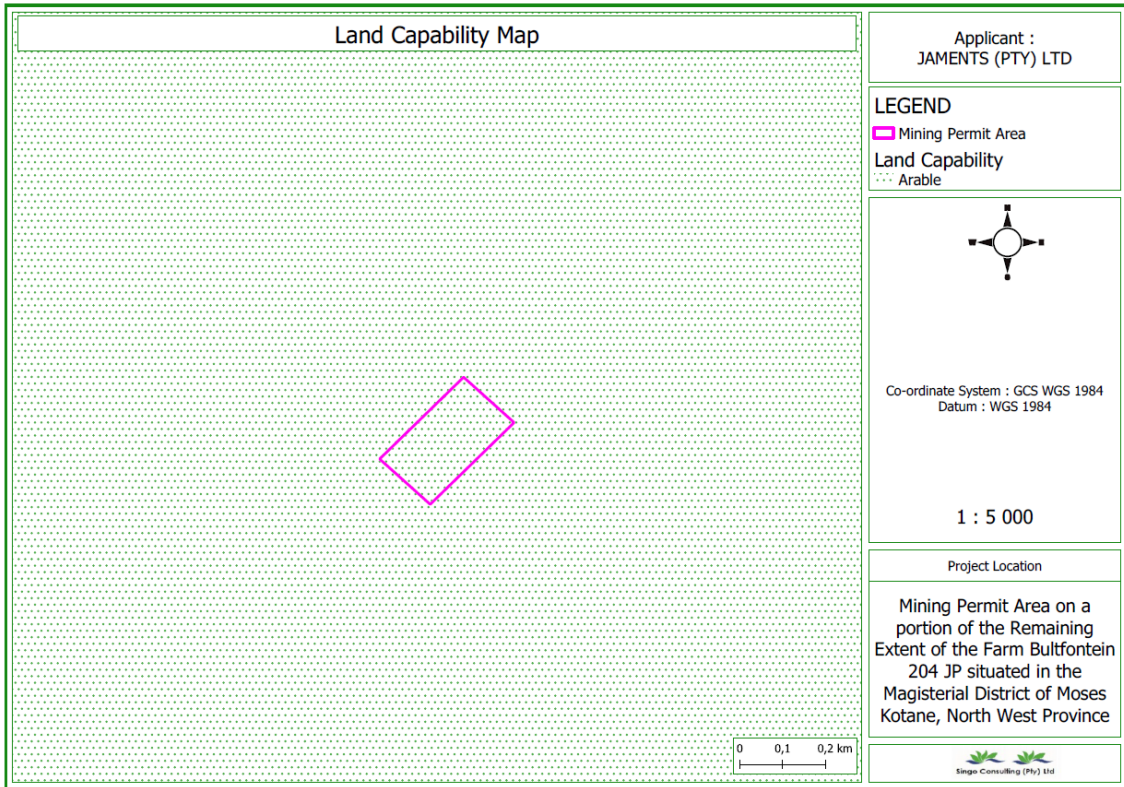


**Google Earth View.**

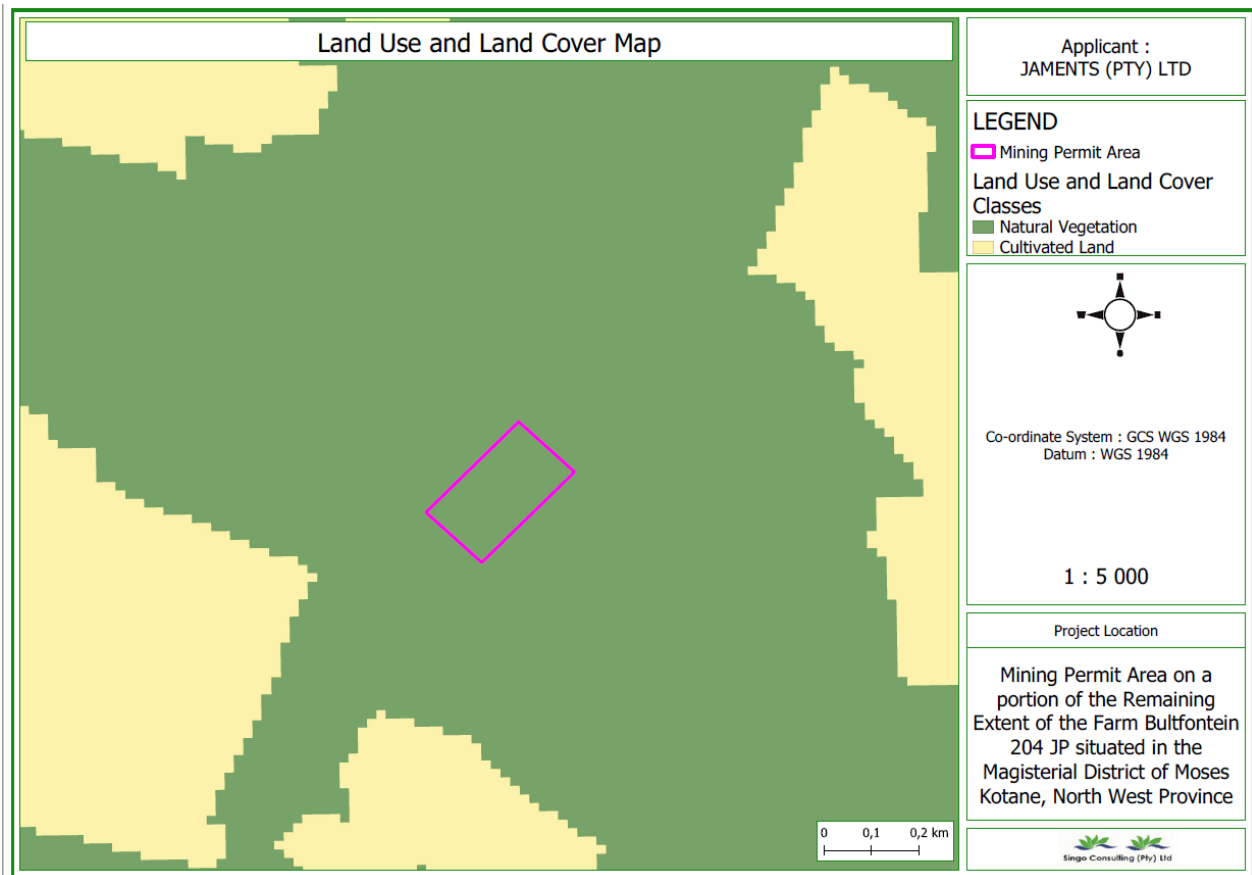


**Hydrology Map.**

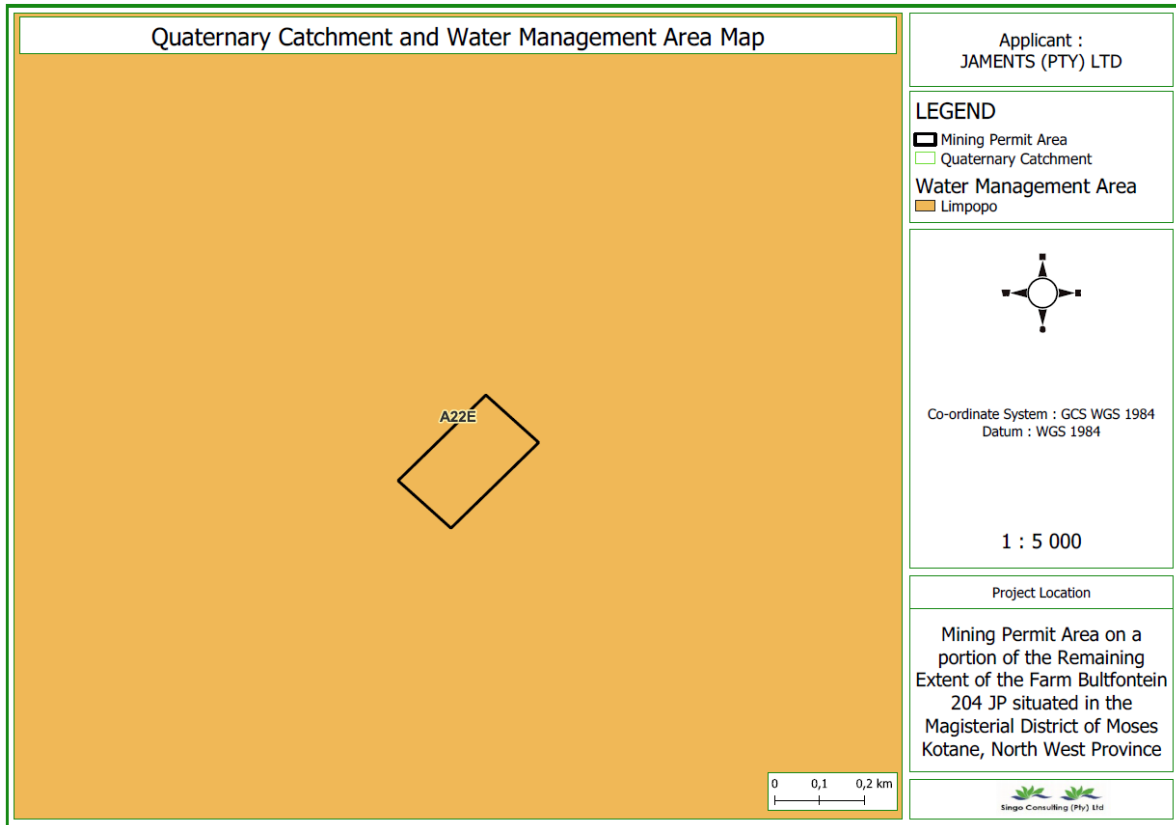




**Land Capability Map.**



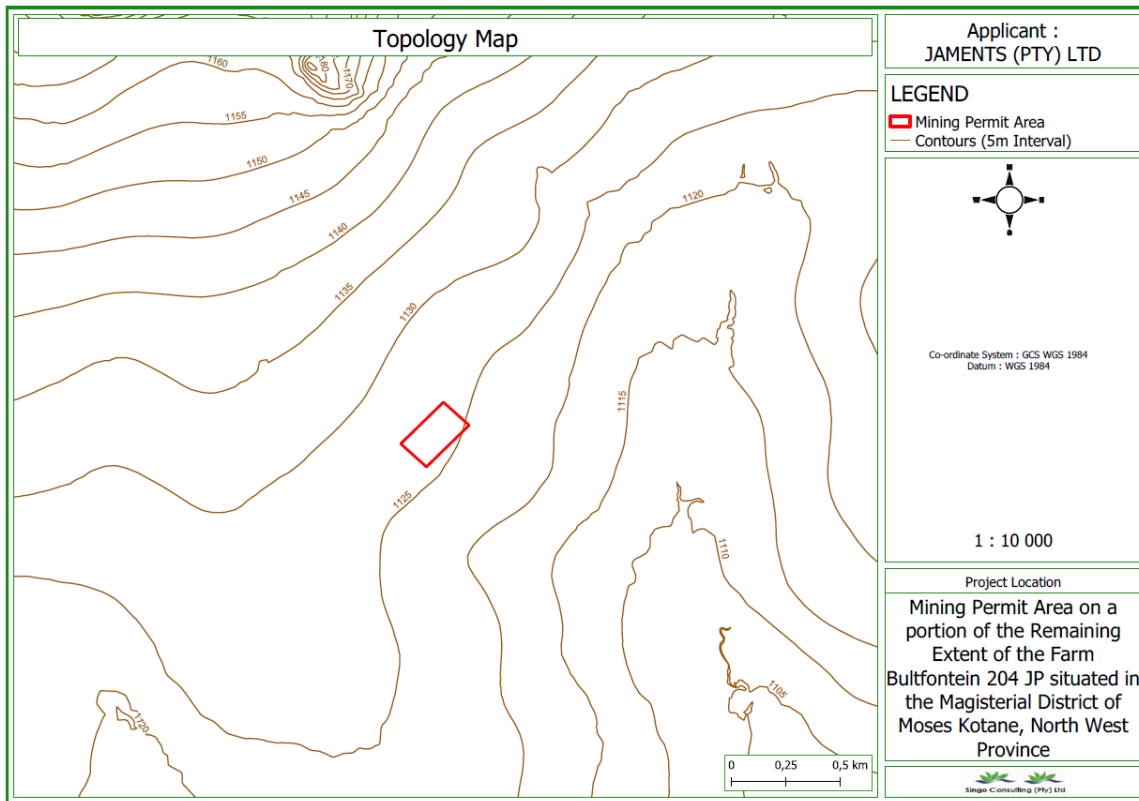
**Land Use and Land Cover Map.**



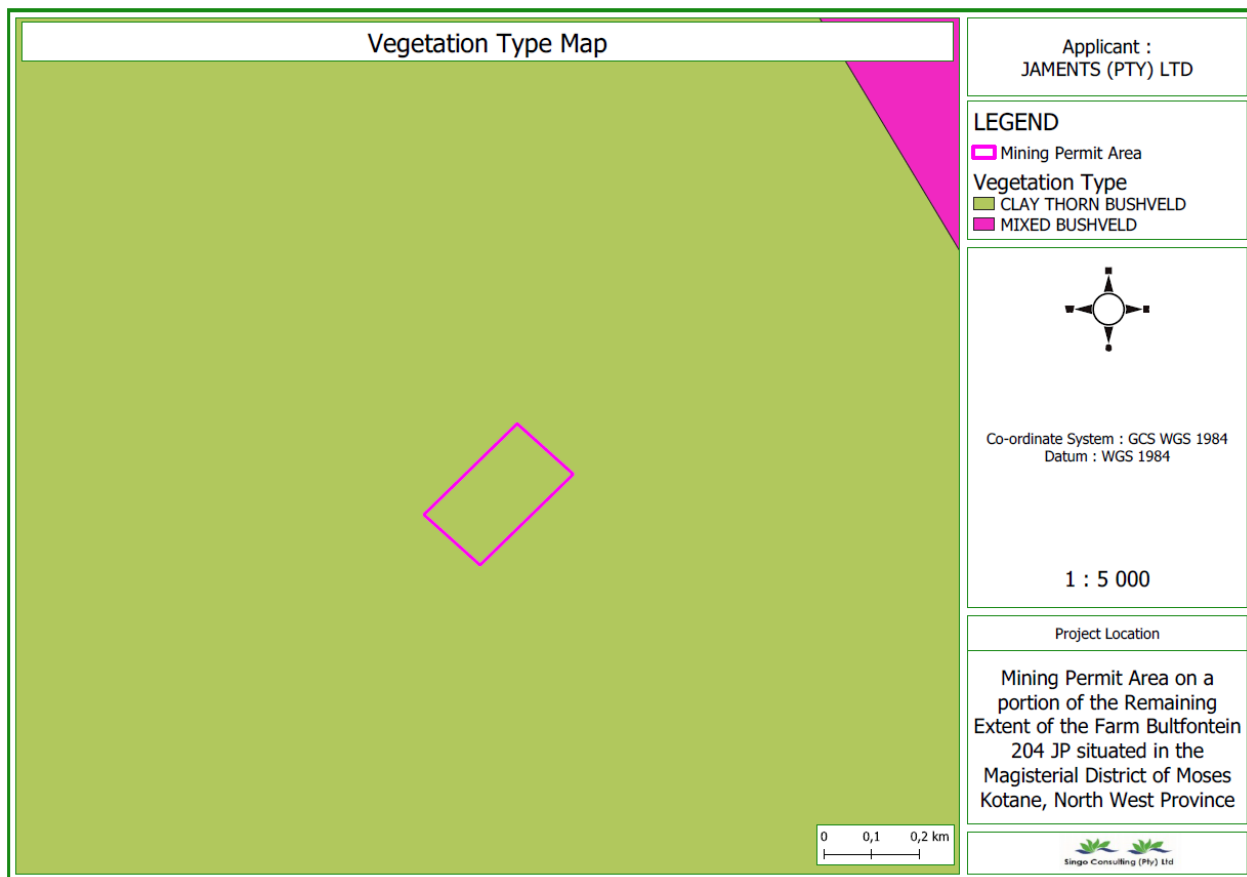
**WMA Map.**



**Soil Map.**



**Topology Map.**



**Vegetation Map.**

# APPENDIX 4: SUPPORTING IMPACT ASSESSMENT

## Environmental impact statement

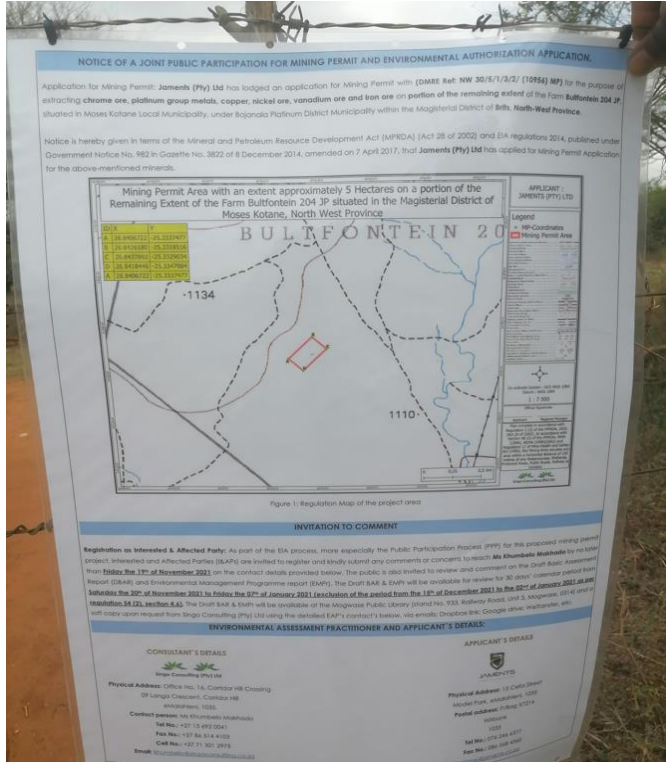
Taking the assessment of potential impacts into account, herewith please receive an environmental impact statement that summarises the impact that the proposed activity may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and significance of impacts.

Type of impact	Likelihood	Significance
<b>Site establishment/ construction phase</b>		Duration: Planning phase
<b>Topsoil stripping and stockpiling</b>		
Visual intrusion associated with mining area establishment	Possible	Medium concern
Dust nuisance caused by soil disturbance	Low possibility	Low concern
Noise nuisance caused by machinery stripping and stockpiling topsoil	Low possibility	Low concern
Infestation of topsoil heaps by weeds and invader plants	Low possibility	Low concern
Loss of topsoil due to incorrect storm water management	Low possibility	Low concern
Area contamination with hydrocarbon/hazardous waste	Low possibility	Low concern
<b>Operational phase</b>		Duration: Operational phase; minimum of 3 years
<b>Excavation</b>		
Visual intrusion associated with the excavation activities	Definite	Medium concern
Dust nuisance due to excavation activities	Low possibility	Low concern
Noise nuisance generated by excavation equipment	Low possibility	Low-medium concern
Unsafe working conditions for employees	Low possibility	Low concern
Negative impact on the fauna and flora of the area	Low possibility	Low concern
Area contamination with hydrocarbon/hazardous waste	Low possibility	Low concern
Weed and invader plant infestation of the area	Low possibility	Low concern

<b>Crushing</b>		
Dust nuisance due to the crushing activities	Possible	Low-medium concern
Noise nuisance generated by the crushing activities	Possible	Low-medium concern
Area contamination with hydrocarbon/hazardous waste	Low possibility	Low-medium concern
<b>Stockpiling and transporting</b>		
Visual intrusion associated with the stockpiled material and vehicles transporting the material	Low possibility	Low-medium concern
Loss of material due to ineffective storm water handling	Low possibility	Low concern
Weed/invader plant infestation of area due to soil disturbance	Low possibility	Low concern
Dust nuisance from stockpiled material and vehicles transporting the material	Low possibility	Low concern
Degradation of access roads	Possible	Low-medium concern
Noise nuisance caused by vehicles	Low possibility	Low concern
Area contamination with hydrocarbon/hazardous waste	Low possibility	Low concern
<b>Decommissioning phase</b>	Duration: Decommissioning phase	
<b>Sloping and landscaping during rehabilitation</b>		
Soil erosion	Low possibility	Low concern
Health and safety risk posed by un-sloped areas	Low possibility	Low concern
Dust nuisance caused by sloping and landscaping	Low possibility	Low concern
Noise nuisance caused by machinery	Low possibility	Low concern
Area contamination with hydrocarbon/hazardous waste	Low possibility	Low concern
<b>Replacing of topsoil and rehabilitation of disturbed area</b>		
Loss of reinstated topsoil due to absence of vegetation	Low possibility	Low concern
Infestation of the area by weed/invader plants	Low possibility	Low concern



# APPENDIX 5: PROOF OF SITE ASSESSMENT AND CONSULTATION.







# APPENDIX 6: BACKGROUND INFORMATION DOCUMENT

**BACKGROUND INFORMATION DOCUMENT**

MINING PERMIT AND ENVIRONMENTAL AUTHORIZATION APPLICATION FOR JAMENTS (PTY) LTD WITHIN THE PORTION OF THE REMAINING EXTENT OF THE FARM BULTFONTEIN 204 JP, SITUATED UNDER THE LOCAL MUNICIPALITY OF MOSES KOTANE IN THE MAGISTERIAL DISTRICT OF BRITS, NORTH WEST PROVINCE

<p>CONSULTANT</p>  <p><b>Singo Consulting (Pty) Ltd</b></p>	<p>APPLICANT</p>  <p><b>JAMENTS</b> <small>HOME OF THE FUTURE</small></p>
--	--

## INTRODUCTION

Singo Consulting (Pty) Ltd has been appointed as an independent Environmental Consultant by **Jaments (Pty) Ltd** to conduct Environmental Impact Assessment (EIA), Compile an Environmental Management Programme report (EMPr) and undertake Public Participation Process (PPP). This is done for processes of acquiring Environmental Authorization for the proposed Mining Permit Application within portion of the remaining extent of the Farm Bultfontein 204 JP, situated in Moses Kotane Local Municipality, under Bojanala Platinum District Municipality within the Magisterial District of Brits, North-West Province (DMRE Ref: NW 30/5/1/3/2/ (10956) MP)

## THE PURPOSE OF THIS DOCUMENT

The Purpose of this Background Information Document (BID) is to provide a perfunctory description of the project and outline EIA processes to be followed and contributions from Interested and Affected Parties (I&APs) on the issues related to the project in question, allowing comments and concerns to be raised.

Results of the EIA, both negative and positive will be submitted and made available to the relevant Departments such as the Department of Mineral Resources and if requested, Environmental Affairs, Water and Sanitation, Landowners, and other interested stakeholders. This Background Information Document therefore requests and invite I&APs to comment on the environmental, physical, Social and economic impacts associated with the proposed Mining Activities.

Be assured that your comments are of great value as they ensure that relevant issues are taken into consideration. Attached at the end of this document is a registration form, kindly complete it and send it back to **Ms Khumbelo Makhado** through given means of communication also attached there.

## PROJECT DESCRIPTION

Mining Permit Application has been submitted for the extraction of **chrome ore, platinum group metals, copper, nickel ore, vanadium ore and iron ore** resources on the property mentioned above. The Mining Permit is situated approximately 39.42 km North-East of Swartruggens and about 55.73 km North-West of Rustenburg.

Mining activities will be undertaken over a period of two (2) years. This project will entail an open cast method of excavation. The mine design will be developed according to the dimension of the applied minerals within the project area, but overall mining activities will be limited to an area of 5 Ha as per mining permit requirements. The topsoil will be stockpiled elsewhere on site preferably next to the farm boundary and will be used during rehabilitation period. Once a box cut has been made, the overburden and mineral resources where necessary will be loosened by blasting. The loosened material will then be loaded onto trucks by excavators. A haul road will be situated at the side of the open cast, forming a ramp up which trucks can drive, carrying ore and waste rock. Waste rock will be piled up at the surface, near the edge of the open cast (waste dump). The waste dump will be tiered and stepped, to minimize degradation. All the activities will be guided by the project's EMPr such that the project does not impact the environment negatively.



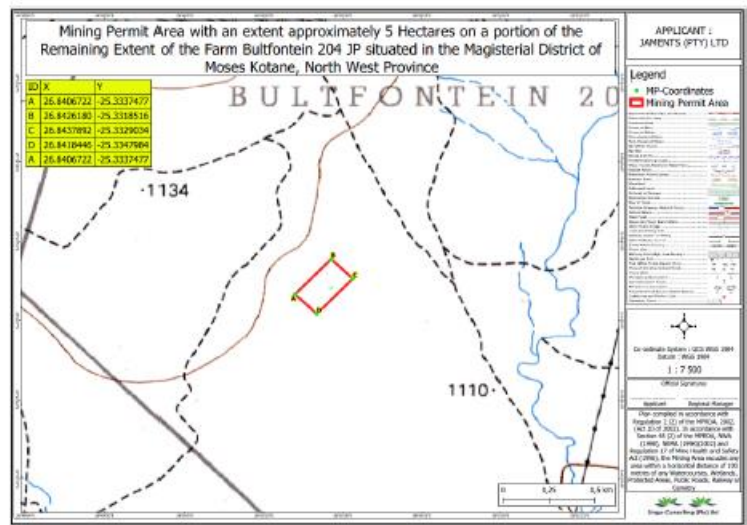


Figure 1: Regulation 2.2 map of the proposed project area

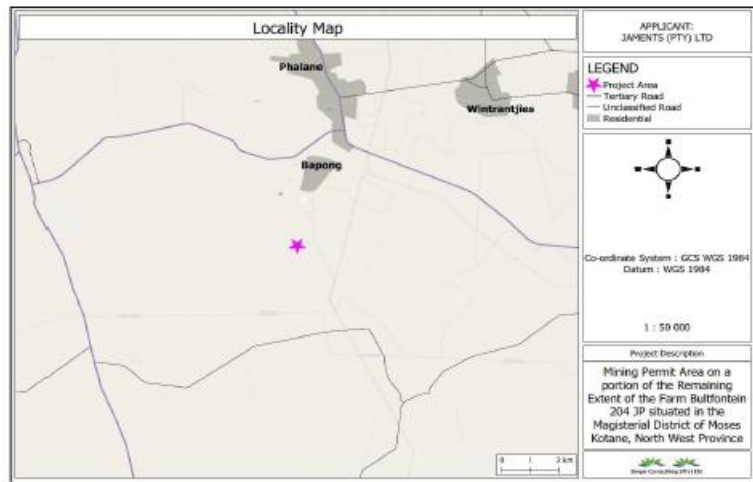


Figure 2: Locality map of the proposed project area.

#### REGULATORY FRAMEWORK

The EIA process through BAR & EMPr to be undertaken will be conducted in accordance with the National Environmental Management Act (Act 107 of 1998) and Environmental Impact Assessment regulations as amended (April 2017).

The activity is to extract the existence and occurrence of the applied mineral; therefore, this will be conducted in accordance with Mineral and Petroleum Resources Development Act, (Act 28 of 2002). Other regulatory guidelines to be followed include: National Water Act, 1998 (Act 36 of 1998), National Air Quality Standards (GN 1210: 2009) and National Dust Control Regulations (GN 275: 2017).

These all will accurately be followed to ensure that identified impacts are assessed and mitigated according to their significance so that the protection of the receiving environment and populations is met.

#### BASIC AND ENVIRONMENTAL IMPACT ASSESSMENT PROCESSES

These are planning and decision-making tools used in identifying potential environmental, economic, and social consequences of a proposed activity prior the commencement of the activity.

These together with the public issues and concerns are to be identified sufficiently early so that they can be assessed and incorporated into the final reports when/if necessary.

These tools are regarded crucial because they are utilized in order to demonstrate to the relevant stakeholders about the potential impacts, which in turn leads to the Mining application process being a success or declined.

#### PUBLIC PARTICIPATION PROCESS

Public Participation remains a cornerstone of the Environmental Impact Assessment process. It ensures provision of relevant and enough information with openness and transparency. Public Participation process presents to I&APs, an opportunity to understand what the project is about, and affords them an opportunity to make valuable contributions towards the EIA process.

I&AP can be any person, group of persons or organization interested in or affected by the proposed activity, and any organ of state that may have jurisdiction over any aspect of the activity.

The key objective of PPP during the EIA Process is to afford the I&APs with an opportunity to comment and provide valuable inputs during the planning phase of the project.

For this specific proposed project, I&APs will be given a period of 30 days to comment and raise issues/concerns with regards to this BID.

Kindly keep the following dates:

◆ Announcement of the Mining Permit Application: **20<sup>th</sup> of October 2021**

◆ Stakeholder engagement and consultation: **Wednesday the 20<sup>th</sup> of October 2021- Friday the 19<sup>th</sup> of November 2021**

◆ Review of Draft Basic Assessment Report (BAR) and Environmental Management Programme report (EMPr):

◆ **20<sup>th</sup> of November 2021 to the 07<sup>th</sup> of January 2022 (exclusion of the period from the 15<sup>th</sup> of December 2021 to the 02<sup>nd</sup> of January 2022 as per regulation 54 (2), section 4.4).**

◆ The Draft BAR & EMPr will be available at the Mogwase Public Library (stand No. 933, Railway Road, Unit 3, Mogwase, 0314) and a soft copy upon request from Singo Consulting (Pty) Ltd using the detailed EAP's contact's below, via email; Dropbox link; Google drive; WeTransfer, etc.



## APPENDIX 7: CONSULTATION OF LANDOWNER



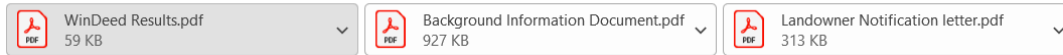
Khumbelo, Makhado <khumbelo@singoconsulting.co.za>

To

Cc: 'Dr Kenneth, Singo'; 'Rudzani Shonisani'; 'Nokuthula'; 'vhumatshelo@singoconsulting.co.za'

Reply Reply All Forward

Thu 2021/11/04 11:04



Good day

I hope this email finds you well.

Kindly note that **Singo consulting Pty Ltd** is currently conducting a Basic Assessment and Public Participation Process (PPP) on behalf of **Jaments (Pty) Ltd**.

**Jaments (Pty) Ltd** has lodged an application for a Mining Permit together with an Environmental Authorization to the North West Department of Mineral Resources and Energy (DMRE) for the extraction of **chrome ore, platinum group metals, copper, nickel ore, vanadium ore and iron ore** on portion of the remaining extent of the **Farm Bullfontein 204 JP**, situated in Moses Kotane Local Municipality, under Bojanala Platinum District Municipality within the Brits Magisterial District, North West Province.  
**DMRE REF: NW 30/5/1/3/2/ 10956 MP.**

**You are hereby being consulted as the landowner because the abovementioned land is owned by the Government, The republic of Bophuthatswana as per the title deeds. Kindly find the attached Title deed Search results, Landowner Notification Letter and Background Information Document (BID) for the detailed description and timelines for the proposed project.**

This Notification is being given in compliance with the terms of: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), National Environmental Management Act, 1998 (Act No. 107 of 1998), and EIA Regulations (as amended, 07 April 2017) which requires that respective landowners and custodians of land must be notified of **Jaments (Pty) Ltd's** intention to obtain Mining Permit for the above-mentioned minerals.

Kindly forward any comments you may have by making use of the comment sheet attached on either BID or Landowner Notification Letter to the email address below.

Kind regards,



**Khumbelo, Makhado**  
Geologist  
*BSc in Mining and Environmental Geology*

+27 71 321 2975  
+27 13 692 0041  
+27 86 514 4103

khumbelo@singoconsulting.co.za  
www.singoconsulting.co.za

**Singo Consulting (Pty) Ltd**

09 Langa Crescent, Office No.16  
Corridor Hill Crossing  
First Floor (South Block)  
eMalaheni

LinkedIn Facebook WhatsApp Instagram

## APPENDIX 8: CONSULTATION OF STAKEHOLDERS

Land Claim Enquiry on the portion of the Remaining Extent of the farm Bultfontein 204 JP, under the Magisterial D...



Khumbelo, Makhado <khumbelo@singoconsulting.co.za>

To

Cc

'Sithokozile, Gcabashe '

'Dr Kenneth, Singo'; 'Rudzani Shonisani'; 'Nokuthula'; 'vhumatshelo@singoconsulting.co.za';

Reply

Reply All

Forward



Wed 2021/10/20 15:51

You forwarded this message on 2021/11/12 07:53.



Good day

I hope this email finds you well.

You are kindly receiving this email as an enquiry for any possible land claim on the portion of the Remaining Extent of the farm Bultfontein 204 JP, situated in Moses Kotane Local Municipality, under Bojanala Platinum District Municipality within the Brits Magisterial District, North West Province. **DMRE REF: NW 30/5/1/3/2/ 10956 MP.**

Kindly review attached BID and Regulation map 2.2 for detailed description of proposed project. This is to ensure that all claimants are properly consulted and are given opportunity to:

- Register as an I&APs and to respond to the environmental compliance process;
- Raise issues of concern and provide suggestions for enhanced benefits;
- Contribute to local knowledge;
- Comment on the Draft Basic Assessment Report (BAR) & Environmental Management Programme report (EMPr); and
- Inform any other person / organization that they may feel should be informed about the project.

Your comments will be highly appreciated as they will assist us in developing a well-informed BAR and EMPr.

Kind Regards,

**Khumbelo, Makhado**  
Geologist  
*BSc in Mining and Environmental Geology*



+27 71 321 2975  
+27 13 692 0041  
khumbelo@singoconsulting.co.za  
www.singoconsulting.co.za



**Singo Consulting (Pty) Ltd**

09 Langa Crescent, Office No.16  
Corridor Hill Crossing  
First Floor (South Block)  
eMalaheni






INVITATION OF STAKEHOLDERS TO COMMENT ON THE PROPOSED MINING PERMIT APPLICATION ON PORTION ...

 Khumbelo, Makhado <khumbelo@singoconsulting.co.za>  
To: \_\_\_\_\_  
Cc: 'Dr Kenneth, Singo'; 'Rudzani Shonisani'; 'Nokuthula'; 'Sithokozile, Gcabashe'; 'vhumatshelo@singoconsulting.co.za'

Reply   Reply All   Forward   ...

Wed 2021/10/20 15:52

 Background Information Document.pdf 927 KB  
  Xerox Scan\_15102021114839.pdf 30 KB  
  REG 2.2.pdf 1 MB

Dear stakeholder/s

I hope this email finds you well.

Singo Consulting (Pty) Ltd on behalf of **Jaments (Pty) Ltd**, hereby wish to inform you that it has applied for a Mining Permit together with an Environmental Authorization to the North West Department of Mineral Resources and Energy (DMRE) for the proposed extraction of **chrome ore, platinum group metals, copper, nickel ore, vanadium ore and iron ore** on portion of the remaining extent of the **Farm Bullfontein 204 JP**, situated in Moses Kotane Local Municipality, under Bojanala Platinum District Municipality within the Brits Magisterial District, North West Province. **DMRE REF: NW 30/5/1/3/2/ 10956 MP.**

This Notification is being given in compliance with the terms of: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA), National Environmental Management Act, 1998 (Act No. 107 of 1998), and EIA Regulations (as amended, 07 April 2017) which requires that stakeholders must be notified of **Jaments (Pty) Ltd's** intention to obtain Mining Permit for the above-mentioned minerals.

This invitation is being extended to you because the department that you represent might somehow be enforcing any of the Republic of South Africa's laws of which

ensures; prevention of pollution & environmental degradation, promotes sustainable development & socio-economic development, or instead might be affected by mining activities. Hence you are being offered an opportunity to:

- Register as an I&AP and to respond to the environmental compliance process;
- Raise issues of concerns and provide suggestions for enhanced benefits;
- Contribute to local knowledge;
- Comment on the Draft Basic Assessment Report (DBAR) & Environmental Management Programme Report (EMPr)

**Singo Consulting (Pty) Ltd** has been appointed as an independent Environmental Assessment Practitioner (EAP) to manage the Environmental Authorization process, by conducting Environmental Impact Assessment, Public Participation for the proposed project and compile an Environmental Management Programme Report. A Basic Assessment process has commenced, for your participation kindly fill the registration and comment form at the end of the **Background Information Document (BID)** attached and register your comments, issues, questions that you may have about the proposed project. Should you need any clarity on the attached document or have any queries with regards to the project, please do not hesitate to contact the appointed EAP on the details provided below.

**Please find the attached BID, Acceptance Letter (DMRE) and a Regulation 2(2) Map for your perusal.**

If you know anyone who might be interested in this project, kindly forward this email to that person.

Kind regards,





## Khumbelo, Makhado

Geologist

*BSc in Mining and Environmental Geology*



+27 71 321 2975



+27 13 692 0041



khumbelo@singoconsulting.co.za



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Singo Consulting (Pty) Ltd



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LinkedIn   