mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: Stanley Masinga

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FILE REFERENCE NUMBER SAMRAD: NW30/5/1/3/3/2/1/10519EM

NW30/5/1/3/3/2/1/00019MP

1. IMPORTANT NOTICE

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

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

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

It is therefore the instruction that the prescribed reports required in respect of application 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 requested 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 order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the Applicant.

2. OBJECTIVE OF THE 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 activity is located and document how the proposed 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 the technology alternatives on the these aspects to determine:
   (i) The nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
   (ii) The degree to which these impacts-
      (aa) Can be reversed.
      (bb) May cause irreplaceable loss of resources.
      (cc) Can be managed, avoided or mitigated.

e) 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

(i) Identify and motivate a preferred site, activity and technology alternative.
(ii) Identify suitable measures to manage, avoid or mitigate identified impacts.
(iii) Identify residual risks that need to be managed and monitored.

This report has been designed to meet the requirements for a Basic Assessment Report and Environmental Management Programme as stipulated in the 2014 Environmental Impact Assessment Regulations (as amended) promulgated under the National Environmental Management Act, 1998 (Act 107 of 1998). The adjudicating authority for this application is the Department of Mineral Resource and this report has been compiled in accordance with the applicable Department of Mineral Resources Guidelines and Basic Assessment Report and Environmental Management Programme template.

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DEFINITIONS

Applicant - The person or party applying for Environmental Authorization for a listed activity and who is responsible for ensuring the development complies with all relevant legislation whether or not they are the land owner.

BAR and EMPR - Basic Assessment Report and Environmental Management Programme. DMR document for joint BAR and EMP related for mineral applications.

EAP - Environmental Assessment Practitioner

ECO - Environmental Control Officer.

EIA Regulations - Environmental Impact Assessment Regulations.

Environment - The Environment is defined in terms of the National Environmental Management Act (Act 107 of 1998) as the surroundings within which humans exist and that are made up of: The land, water and atmosphere of the earth: Micro-organisms, plant and animal life, any part or combination of the first three items and the inter-relationships between them the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Fauna - All living biological creatures, usually capable of motion, including insects and predominantly of protein based consistency.

Financial Provision - Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations.

Flora - All living plants, grasses, shrubs, trees, etc., usually incapable of easy natural motion and usually capable of photosynthesis.

I&AP - Interested and Affected Parties.

EXECUTIVE SUMMARY

The Applicant, Stanley Masinga has an approved Mining Permit and Environmental Management Programme (EMPR) in terms of the Minerals and Petroleum Resources Development Act (Act 28 of 2002, as amended) (MPRDA) for mining of stone aggregates on a certain portion of Portion 0 of Farm Vogelstruisnek 173JP.

Mr Masinga wishes to amend the approved Mining Permit (NW30/5/1/3/3/2/1/10519MP) to include the following:

- Add chrome as another mineral that will be mined.

In order to amend the current Mining Permit to include chrome it is necessary that an Environmental Authorisation (EA) application be submitted to the DMR. Geopoint Africa, on behalf of Mr Masinga will have to assess the new environmental impacts associated with the addition of another mineral, in order to establish appropriate mitigation measures to address the impacts. As such, a revised consolidated EMPR is required.

The chrome will be transported and processed according to the existing mines approved operations.

PART A

SCOPE OF ASSESSMENT AND BASIC ASSESSMENT REPORT

1. Details of the EAP

Name of the practitioner:	Martha Monoke
Tel No.:	015 291 2341
Fax No.:	086 605 6367
E-Mail address:	Martha@geopointafrica.co.za

1.1. Expertise of the EAP

According to regulation 13 of NEMA 2014 EIA Regulations an independent EAP must be appointed by the Applicant to manage the application. The Applicant appointed Geopoint Africa (PTY) LTD to be their EAP and are compliant with the definition of an EAP as defined in the 2014 EIA Regulations and NEMA.

Mr Topman Ngonyama (Founder & Group CEO) is a qualified Geologist & a Mining Entrepreneur by profession, with over 15 years' experience gained from various projects ranging from grassroots exploration to mine development. His unconventional entrepreneurial approach to opportunities gleams within the extensive resource development experience that he has acquired over the years. Mr Ngonyama's achievements include amongst others, setting up a portfolio that boasts about 18 projects throughout Africa using an in-house seed fund. His vision is to foster the development of a large multi-commodity portfolio through strategic partnerships and to position GeoPoint Africa as a world class mining powerhouse.

Martha Monoke holds a Bachelor of Science Honours Degree in Environmental Management. She has over 4 years' experience within the field of environmental management. She has worked as an Environmental Assessment Practitioner and as an Environmental & Occupational hygiene technologist within the mining industry where she developed and monitored core competencies in the following areas: Environmental Management, ISO14001 and ISO18001 systems, environmental monitoring and ventilation in underground and hardrock operations. She handles projects throughout the project life cycle from exploration through pre-feasibility to feasibility to operation, rehabilitation and closure. This includes screening and scoping exercises, basic assessments, impact and risk assessments, monitoring, management planning and implementation.

Tinyiko Chauke holds a Bachelor of Science Degree in Geology. She is a graduate geologist that has been involved in desktop studies and exploration of several chrome and aggregate stones projects in the North West and Mpumalanga provinces.

Rolindela Ndlovu holds a Bachelor of Science Degree in Physical Science. She is a graduate geologist that has over 1 year experience in exploration. She has acquired significant skills in geological mapping, desktop studies, map production, geochemical sampling and geophysical survey (magnetic survey).

Penelope Mashapa holds a BSc (Hons) degree in geology from the University of Limpopo. She has over 4 years' experience and has been involved in several multi-commodity projects at Geopoint Africa. Through the years, she has acquired the diverse set of skills including geological mapping, geochemical sampling, map production, desktop studies and modelling. She continuously gains significant skills

and experience in exploration through working with both internal and external experts. Penelope has been involved in grassroots exploration of various commodities including limestone, coal, manganese, iron-ore and chrome.

2. Location of the overall Activity

Table 1: The location of the overall activity

Farm Name	Vogelstruisnek 173JP Portion 0
Application area (Ha)	4.55 Ha
Magisterial District	Moses Kotane
Distance and Direction from nearest town	Approximately 55km North West of Rustenburg
21 digit Surveyor General Code for each farm portion	Co-ordinates: A. 26.921104 -25.262458 B. 26.922147 -25.261965 C. 26.923880 -25.264644 D. 26.922948 -25.265235

Figure 1: A locality map of the proposed mining area indicating Rustenburg as the nearest town.

3. Description of the Scope of the proposed overall activities.

Figure 2: A site plan map of the proposed mining project.

3.1. Listed and specified activities

Table 2: A list of specified activities and the relevant notice.

NAME OF ACTIVITY	Aerial Extent Of Activity Ha or m^2	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICATION LISTING NOTICE *(GNR 544, GNR 545 or GNR 546)*
Loading, Hauling and Transporting	40 m^2	X	
Quarrying	0.59 Ha	X	Listing Notice 1, Activity 21
Chemical and fuel storage area	8m^2	X	GNR983
Stockpiling	0.037Ha	X	Listing Notice 1, Activity 21
Access routes	200m^2	X	GNR983
Offices	8m^2	X	GNR983
Ablution facility			
Equipment storage area	0.094Ha		Listing Notice 1, Activity 21
Crushing	336m^2	X	Listing Notice 2, Activity 21
Screening	387.48m^2	X	Listing Notice 2, Activity 21
Vegetation clearance		X	Listing Notice 1, Activity 27

3.2. Description of the activities to be undertaken

PROPOSED MINING ACTIVITIES DESCRIPTION

Open cast mining will be used for this surface mining project. The area requiring a mining permit shall be mined in blocks, one at a time.

- Demarcation of the mining area shall be done by fencing around it.
- Vegetation clearing
  Vegetation clearing shall occur in areas that will be disturbed only, i.e. quarry sites, haul roads and the crushing area etc.
- Prior to the commencement of mining activities on site, it is necessary to remove the overburden. The overburden is the topsoil or subsoil of the surface. All the topsoil shall be removed and stored separately in a demarcated area. Removal of topsoil will be done by scrappers or tracked excavators. The overburden will be hauled with articulated dump trucks (ADTs) to the mine site perimeters and into berms. The topsoil will be stored in a way that minimise erosion the erosion and run-off.
- Portable chemical toilets shall be used on site
- Establishment of access roads and placing of portable offices on the premises.
- Excavation
  Once the overburden has been removed, the sedimentary rock will be excavated. Depending on the geological formation, blasting may be used to make the stone containing material more amendable to excavate. The excavation will be performed by tracked excavators and front-end loaders. The excavated material (product) will be stockpiled on site, crushed and screened before being transported to designated areas off-site.
- Blasting

In a situation where the stone bearing geological formation is tightly cemented it may be necessary to utilize explosives in order to make the stone more amenable for removal. Use of explosives results in noise pollution, vibration and fugitive dust emissions. The blasting frequency will vary according to the site specific geology. At this stage it is not possible to describe a definite blasting schedule due to the particular geological formation.

- Crushing

  The excavated product material shall be crushed to reduce the sizes of the particles. A portable mobile crushing unit will be use to crush the rocks into relatively small particles.
- Screening of crushed material

  A portable screening unit shall be used to screen the crushed material so that it could be sorted into various sizes tailor made for the market.
- Transportation

  Open topped dump trucks will be used to transport the crushed product to designated areas off-site.

- The stone aggregates and chrome will be loaded by an excavator and hauled to the appropriate area. All the load and haul operation will be outsourced to a competent mining contractor who has to keep the following fleet:
  i. 2 x Excavators
  ii. 2 x D9 Dozers
  iii. 2 x Articulated Dump-Trucks
  iv. 1 x TLB
  v. 1 x 10 000L Watercart

OPERATIONAL PHASE SUPPORT SERVICES AND FACILITIES

- Roads:

  There is an existing good internal network of roads (tared and gravel roads) from the mine to the nearest town. The roads shall be maintained by a certified contractor.

- Communication System:

  The communication system as provided by Telkom (National Telecommunication Network-landline) and cellular relay towers operated by MTN and Vodacom is adequate.

- Security Facilities:

  Security system will be outsourced to a competent security contractor.

- Offices:

  Mobile Containers will be used as offices after the mining permit has been issued:

  - Reception, administration and the finance office
  - Workshops
  - Temporary offices for blasting and mining contractors will be located at the mine. No employees will be allowed to stay on the property.

- Maintenance:

  A full maintenance team will be employed to ensure maximum availability of plant by monitoring the equipment on a daily basis to identify problems and initiate repairs when needed. Regular inspection and condition status assessments will be carried out on major and critical equipment and installations (i.e. transformers/Substations and other process equipment) by an independent specialist institutions.

- Stores:

Spare supply agreements shall be negotiated with supply companies (OEM's) to deliver spares within 24hours on order. Major spares components and insurance spare shall be kept in the mine storage. Spares availability is managed by utilising a min./max. control and recording system taking cognisance of delivery times.

DECOMMISSIONING PHASE ACTIVITIES

In broad terms, decommissioning activities associated with the proposed site include the demolition and the removal of infrastructure, preparation of final land forms for closure and prompting vegetation growth in order to reduce the effects of soil erosion and re-establish landscape functionality.

CLOSURE PHASE ACTIVITIES

After decommissioning, closure activities will include maintenance and aftercare that is required to ensure that rehabilitation is successful. In regard, one of the options that will be considered is rehabilitation to grazing potential land. Rehabilitation of the pit, involving the replacement of topsoil and replanting and re-establishment of vegetative cover, as well as monitoring and evaluating.

4. Policy and Legislative Context

Table 3: A list of applicable 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.
Constitution of the Republic of South Africa (Act No.108 of 1996)	Mining Activities	In terms of the section 24 of the Constitution of South Africa, everyone has right to an environment that is not harmful to their health or well-being. People have a right to have their environment protected, for the benefit of present and future generations through suitable legislations and other measures that prevent pollution, ecological degradation and promote conservation and secure ecological sustainable development. The needs of the environment and affected parties will be integrated into the project, in order to abide by Section 24 of the Constitution.
National Environmental Management Act (NEMA), No. 107 of 198, as amended)	Mining Activities	In terms of Section 24 of the National Environmental Management Act, an application for an Environmental Authorization has been applied for
South African National Roads Agency Limited and	Mining Activities	Traffic statement- there will be minimal vehicles per hour

National Roads Act, 1998 (Act No.7 of 1998)		
Regulation 983. National Environmental Management Act (Act No. 107 of 1998): Listing Notice 1: List of activities and competent authorities identified in terms of Section 24(2) and 24D	Mining Permit Application	In terms of NEMA EIA Regulations R.983, Listing notice 1, the activity triggers Regulation 21 which refers to a mining permit application and therefore needs an Environmental Authorization to proceed as well as follow procedures as prescribed in regulation 19 of R.982 (EIA Regulation, 2014)
National Environmental Management Act (No.107 of 1998)	DMR	This Basic Assessment is being undertaken in terms of National Environmental Management Act (No.107 of 1998). This is in order to determine any possible impacts on the environment and propose sufficient mitigation measures in order not to harm the environment.
National Environmental Management Waste Act (No.59 of 2008)	NEM: WA	Proper waste management strategies are to be employed, especially with hazardous waste.
Moses Kotane Local Municipality Integrated Development Plan 2018/2019 June 2018	Mining Activities	One of the IDP goals for Local Economic Development is to uplift communities and contribute to the alleviation of poverty by stimulating employment.

		This project aims to mainly employ locals, in order to be in line with the IDP of the municipality.
Environmental Impact Assessment Regulations: 982 to 985 of 4 December 2014	BAR and EMPr	In terms of Regulation 19 of the EIA Regulations a BAR should include specialist reports (where applicable), which should be subjected to a public participation process of 30 days and should incorporate comments received and comments of the competent authority.
National Heritage Resource Act, 1999 (Act 25 of 1999)	BAR and EMPr	In terms of Section 38 of the National Heritage Resource Act regulates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.1 hectares (ha). The Act make provisions for the potential destruction of existing sites, pending the archaeologist recommendation through permitting procedures. The Rights are administered by the SAHRA should the proposed activities impact on heritage resources, application to SAHRA would be required to obtain the necessary permits. The proposed mining operations will not have any impact on heritage resources, as no resources of significance were identified on site.
Mine Health and Safety Act (Act No.85 of 1993)	Mining Activities	The MHSA provides for the protection of health and safety of all personnel on site. Its requirements will be met, especially during the construction and operational phases of proposed project.

Regulation 983. National Environmental Management Act (Act No.107 of 1998): Listing Notice 1: List of activities and competent authorities identified in terms of section 24(2) and 24D	Mining Activities	In terms of the NEMA EIA Regulations R.983, Listing Notice 1 the planned mining activities do not trigger Activity 27 because vegetation of more than 1 hectare will not be cleared.

5. Need and desirability of the proposed activities

Post analyses of literature, maps and a site survey, it has been concluded that the property has a potential to host a high grade of chrome and aggregate stones. The environment should always be left in a safe manner that is not harmful to the neighbouring communities. The identified plot of land holds no apparent aesthetic or conservation value, in terms of heritage aspects, fauna, and flora. The project will stimulate the local and regional economy as it will facilitate mining of aggregate stones and chrome. The project will create job opportunities for skilled, semi-skilled and unskilled individuals. There is no reason why this development should not be considered at this particular point in time considering the poverty levels and need for development within the province.

The proposed area has low biodiversity and its adjacent site is a mine, therefore the development is one of the better practicable environmental options for this particular site. The Project aims to have the site to be utilized by an ongoing,

sustainable and profitable business. The proposed Project is also not anticipated to result in unacceptable cumulative impacts.

6. Motivation of the overall preferred site, activities and technology alternative.

The National Environmental Management Act 107 of 1998, Environmental Impact Assessment Regulations, 2014 requires the applicant to identity alternatives for project applied for. In terms of the above-mentioned regulations an alternative in relation to a proposed activity, implies that different means of meeting the general purpose and requirements of the activity.

The proposed site is preferred due to the literature studies and the site assessments done on the area that indicate that there could be a high prevalence of chrome and aggregate stones on the proposed site. The proposed mining activities will create much needed job and business opportunities for the locals.

7. Full Description of the process followed to reach the proposed preferred alternatives within the site.

7.1. Details of the development footprint alternatives considered.

7.1.1. The property on which or location where it is proposed to undertake the activity:

No location alternative has been considered because based on the geological setting of area, the site has a high potential for chrome and stone aggregates.

7.1.2. The type of activity to be undertaken:

The operation is an open cast mine, where the extraction of chrome and aggregate stones will be facilitated by a mining method that includes the use of an excavator to skim and stack the chrome and aggregate stones rocks. A front-end loader and excavators will move the chrome and aggregate stones product from the surface to the stockpile area, from where it shall be crushed and screened. The crushed product will be temporarily piled and systematically transported from the temporary storage area to the established stockpile site for stockpiling.

7.1.3. The design and layout of the activity

The location of the activities will be determined based on the location of the mining activities, which will only be determined during site establishment. And the entire infrastructure will be temporary or mobile.

7.1.4. The technology to be used in the activity

The technology that is proposed has been chosen based on experience of successful outcomes in previous mining projects. Generator will be used to supply electricity. Other technologies are to be determined by thickness and hardness of the buried formations.

7.1.5. The operation aspects of the activity

The nature of the proposed mining activities does not require permanent services, such as electricity, sewage facilities and water supply. Ablution facilities will be provided on site in the form of portable chemical toilets that will be supplied and serviced by a registered supplier. Drinking water will be provided on-site on a daily basis. Operational water will be sourced from a registered water user

and no abstraction of water will be done on-site. A generator will be used to supply electricity.

7.1.6. The option of not implementing the activity

The mining sector is one of the main contributors to the South African economy; therefore the option of not implementing the project would set back the country in mining quality chrome and aggregate stones. The mining project will improve the socio-economic status of the area by creating job and business opportunities for the locals. Not approving the activities will result in a vital loss of valuable information regarding the mineral status of chrome and aggregate stones.

8. Details of the Public Participation Process Followed

With accordance to Section 16(4)(b) of the MPRDA read together with Section 40 of the NEMA Regulations, the main aim of undertaking a public participation is to allow interested and affected parties to state their concerns and to seek answers from the applicant. Below is a list of public participation activities that have been undertaken to inform the public, stakeholders and Organs of State, about the mining permit application and availability of the Draft Basic Assessment Report.

Table 4: Summary of the public participation process that was undertaken

Task	Details	Date
	I&APs notification (relevant authorities and I&APs)	
I&APs Identification	An I&APs register list was developed for the project, by establishing the jurisdiction of authorities, individuals and businesses in close proximity to the project site. The register includes landowners, relevant department officials, relevant municipal officials and organisations. This register will continuously be updated as interested and affected parties register to be listed on it, through-out the project life-span. The current I&APs register list is attached as **Appendix 2**.	Continuous process
Site Notices	They have not been placed yet.	
Public Meeting	A meeting will be held on the 26th of September 2019 at the Maologane Community Hall at 10am.	26/09/2019
Initial notification	Notification letters will be sent to various I&APs, in order to notify them about the availability of the Draft BAR and EMPr for the proposed amendment of the existing mining permit. Authorities and I&APs will be given 30days to register and to submit their comments on the proposed project.	09/09/2019
Media Advert	A newspaper advert was published within the Platinum Weekly newspaper issue of the 30th of August 2019.	30/08/2019

Comments received form landowners	The Moses Kotane Local Municipality will be consulted on the day of the public meeting.	Continuous
Comments on the draft BAR	All the relevant stakeholders were notified of the availability of the draft BAR to provide their comments.	

9. The Environmental attributed associated with the alternatives.

9.1. Baseline Environment

Below is a summary of the biophysical environment on the proposed site and the surrounding area:

9.1.1. Climate

The Vogelstruisnek 173JP portion 0 Farm is located within the subtropical high pressure belt. Cold fronts which mainly occur during winter are associated with westerly waves, unstable atmospheric conditions and atmospheric turbulence which creates favorable conditions for air pollutant dispersion. The climatic regime of the farm is characterized by hot, moist summers and mild, dry winters. The monthly and annual evaporation rates greatly exceed the precipitation rates, resulting in semi-arid surface conditions.

9.1.2. Flora

The main vegetation type that is prominent in the area is Clay Thorn Bushveld (also known as Springbok Flats Turf Thornveld). There is a high diversity of trees and shrubs, especially on the ridges and outcrops. The low lying areas were dominated by Acacia species, especially Acacia tortilis, Acacia nilotica and

Arcacia karroo. No Red Data shrub or tree species were identified during the site assessment.

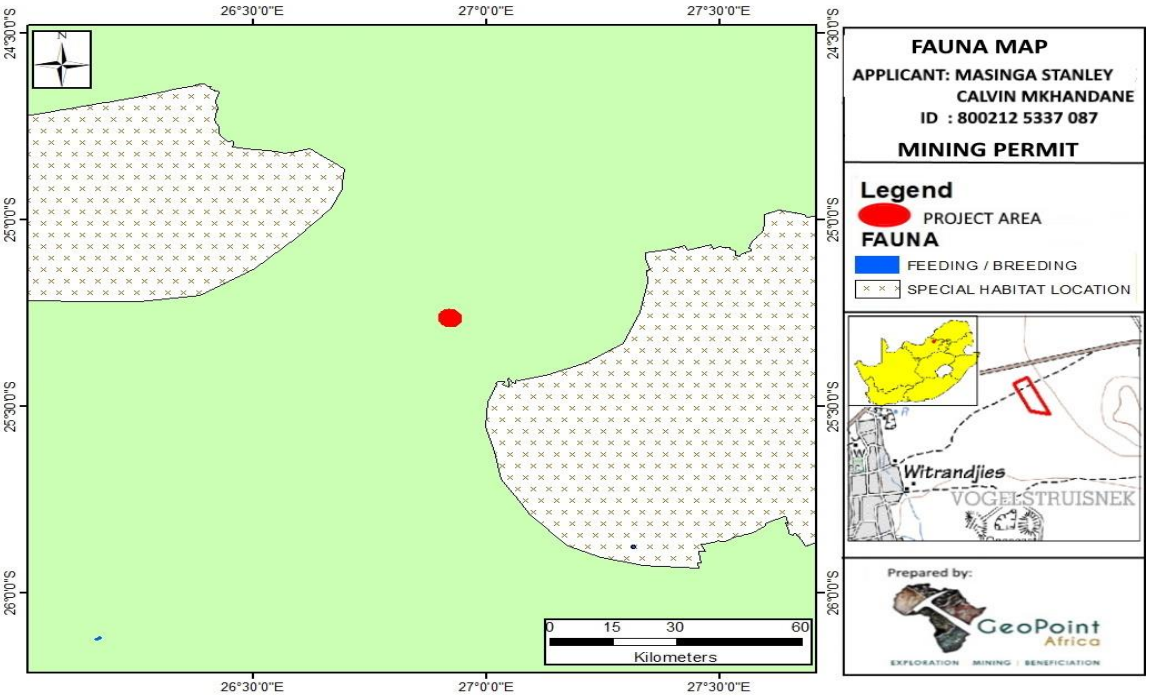

Figure 3: Distribution of vegetation in the study area.

9.1.3. Topography

The proposed area lies along the lower eastern slopes of a series of hills that protude above the surrounding plains, west of Pilanesberg. The area is part located in very gentle rolling and almost flat areas that have only a few distinguishing topographical features. The average elevation within the valley ranges between 1050m - 1550m above mean sea level.

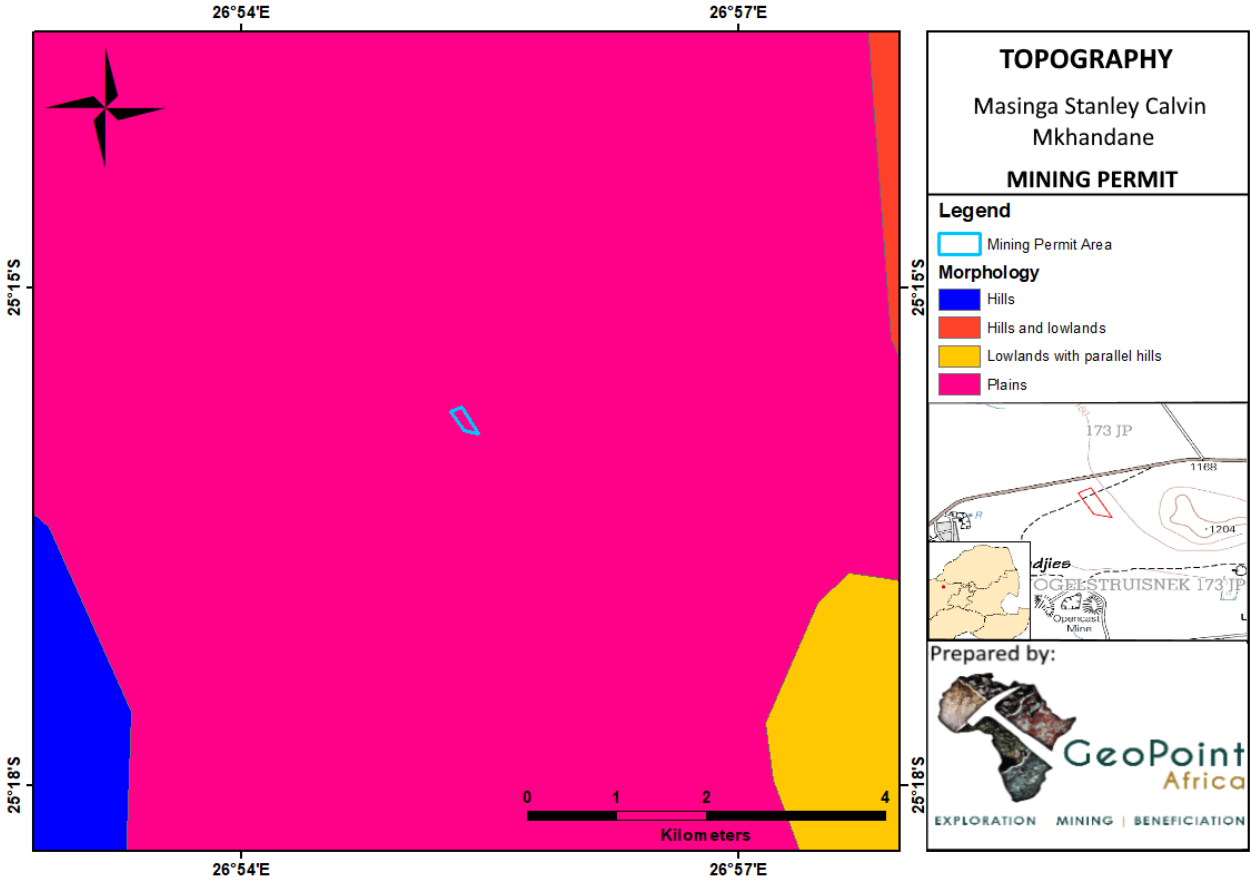

Figure 4: Topographical map showing the plain terrain of the area of interest.

9.1.4. Fauna

Only a few fauna were observed during the site assessment except for rodents (genus Mastomys) and other species that are common and widespread to most vegetation types. Domestic animals (cattle and goats) were observed on the site. Human disturbance and fencing around the site shall exclude many mammal species from the site. No Red Data fauna species were identified during the site assessment.

9.1.5. Soil and land-use

The proposed open pit mining area has a land capability class of grazing, due to the surface disturbance and/ or loss of topsoil. The area is mainly used by local cattle farmers for seasonal grazing purposes.

The soil types in the area are mispah and melanic-form.

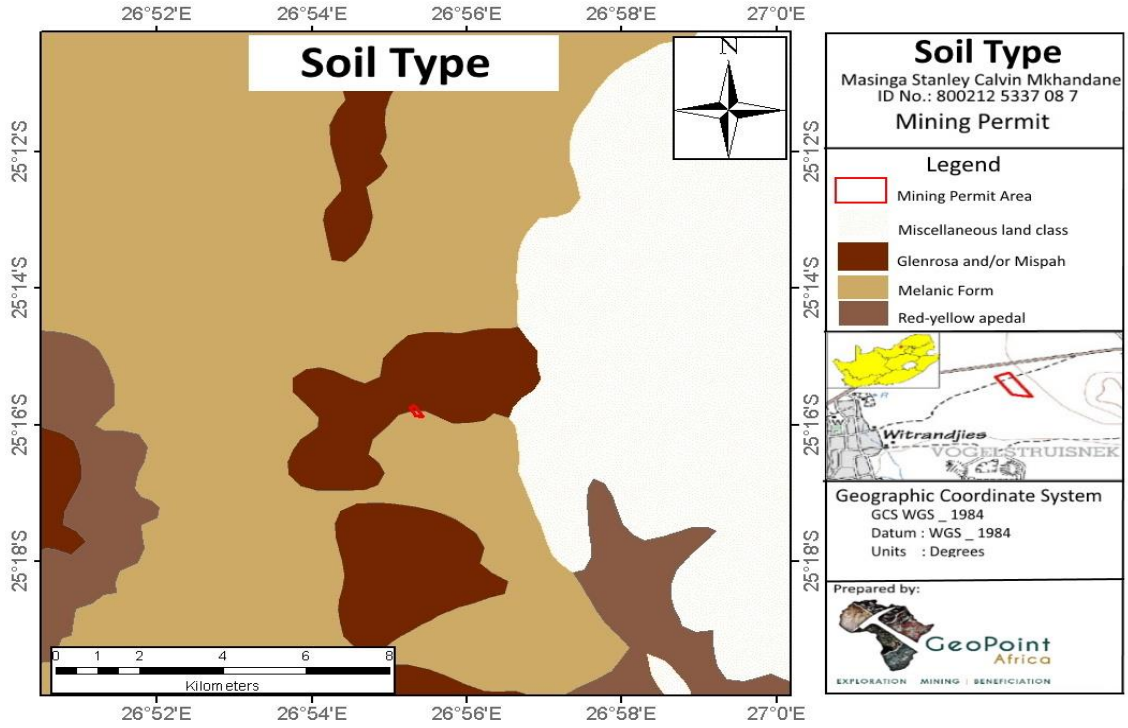

Figure 5: Occurrence of different types of soil in the project area.

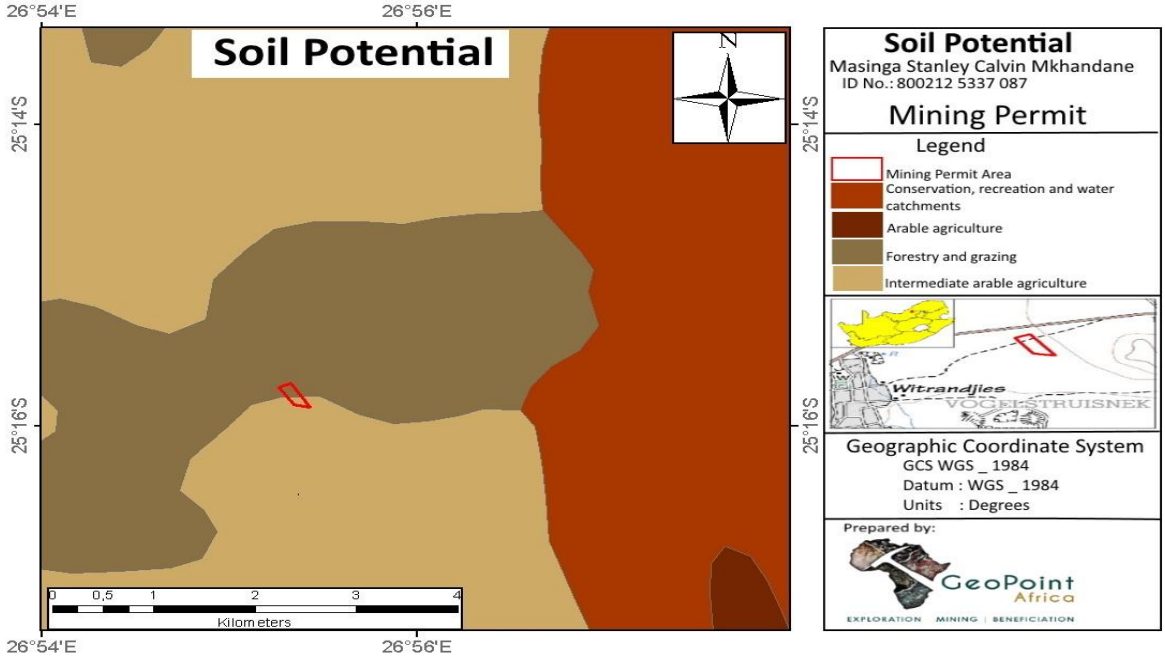

Figure 6: Soil potential and the land-uses in the project area.

9.1.6. Water

There are not any surface water sources within close proximity of the mining area.

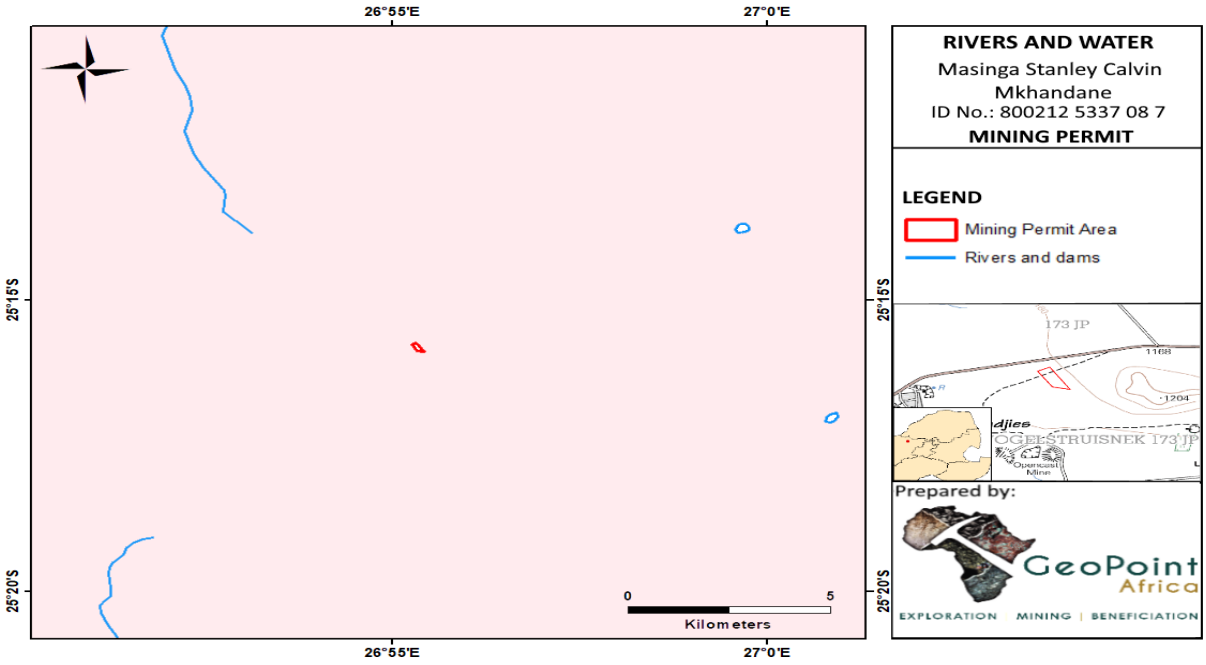

Figure 7: Waterbodies in the study area and surrounding areas.

9.1.7. Heritage Resources

A heritage Impact was not undertaken as a part of the development of the impact Assessment. Based on the available Geographic Information Data, there are no graves present within the proposed mining site. However, South African Heritage Agency has been consulted regarding this mining activity, and we are still waiting for their response.

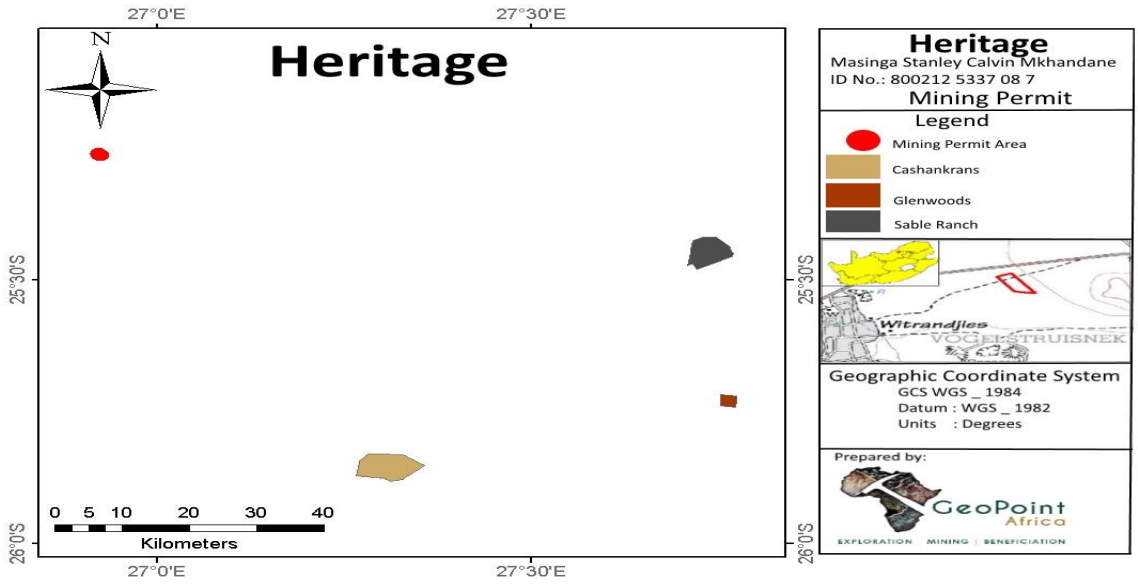

Figure 8: A map indicating heritage resources around the mining area.

9.1.8. Geology

The main geological feature of a certain portion of Portion 0 of Farm Vogelstruisnek 173JP is that it is located within the Bushveld Complex, a saucer-shaped volcanic intrusion that is approximately 2billion years old. The Bushveld Complex is divided into three main geological sectors or limbs: Eastern Limb, western Limb and the Northern Limb. It is also divided from bottom to top into four geological zones: the Lower, Critical, Main and Upper Zone. Volgestruisnek 173JP portion 0 is located within the Western Limb which contains chromium reserves within the Lower Zone. The chromitite layers are enclosed by medium to coarse grained pyroxenite.

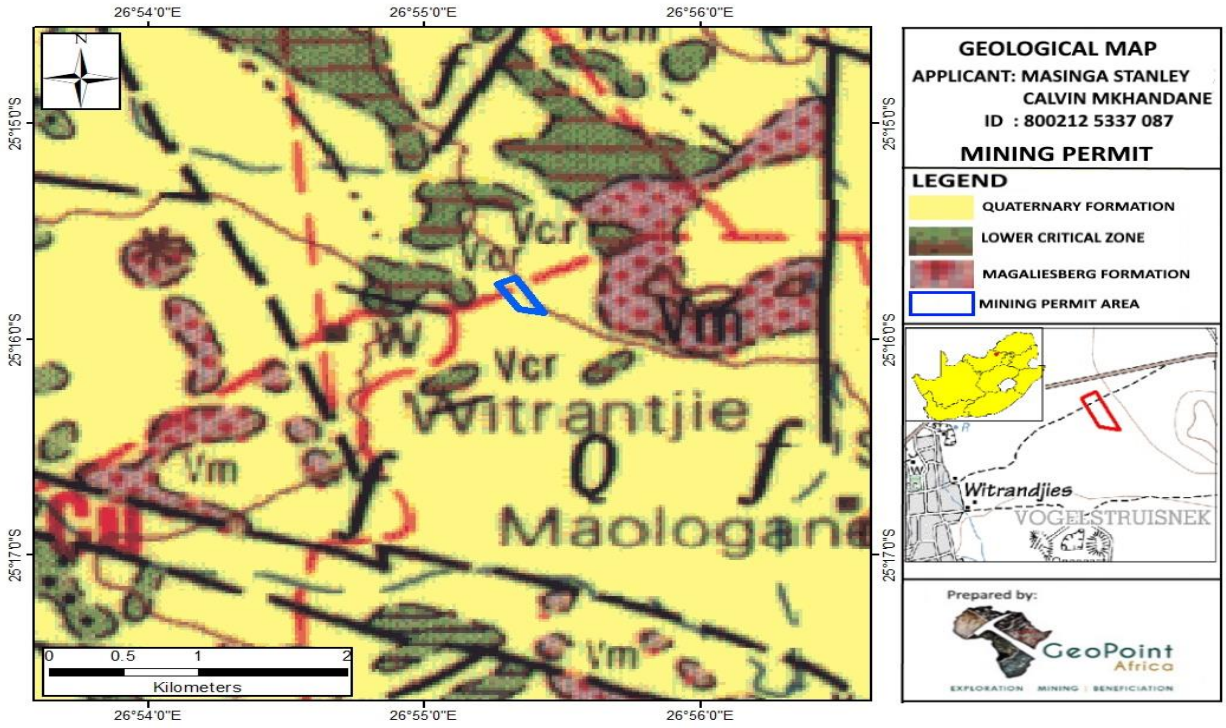

Figure 9: A depiction of the geology in the area.

9.1.9. Socio-economic structure

The proposed area falls within the Bojanala District Municipality and the Moses Kotane Municipality in the North West Province. According to the 2011 consensus (www.moseskotane.gov.za/about-us/) the local municipality had a quoted population of approximately 242 553 with 15% of them being economically active and 51% of them being unemployed. There is a large

number of jobseekers in the economically active group who could supply the mining project with unskilled workers and skilled workers are scarce. The majority of the population is dependent on those that are employed, pensions and other social grants. Most people have access to electricity but they are mainly using pit latrines without ventilation. The main economic sector within the Moses Kotane Municipality are community, social and personal services and mining. Mini-bus taxis are the dominant transport mode for people within the proposed mining region.

9.2. Description of the current land uses

The proposed mining area falls within the rural area that is characterized by livestock grazing and rural residential purposes.

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

The land comprising the application area is rural area that is mainly used for livestock grazing and locals use some of the shrubs and trees as fire wood.

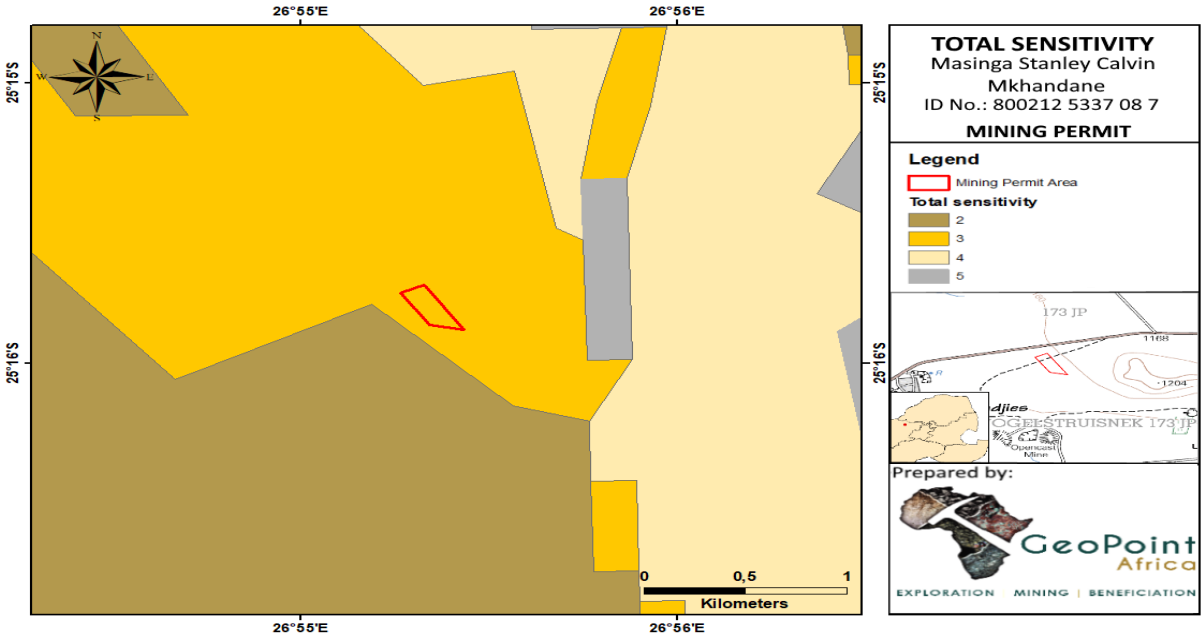

Figure 10: Environmental Sensitivity Map showing that the study area is not highly sensitive.

10. Impacts and risks identified

Table 5: Potential impacts on the biophysical environment

Potential impacts on the Biophysical Impact					
Potential Impact	**Significance**	**Probability**	**Duration**	**Extent**	**Mitigation**
Compaction of soil from movement of heavy machinery	Moderate	Highly likely	Long term	Regional	• Existing roads and tracks will be used as far as possible. • Rehabilitation of disturbed areas will take place.
Loss of topsoil	Moderate	Definite	Medium term	Site	• Any removed topsoil will be kept to one side and protected from being blown away or being eroded. • Rehabilitation of quarry and any other disturbed areas will take place.
Erosion from vegetation clearing	Moderate	Likely	Long term	Site	• Sediments and erosion controls will be designed to prevent runoff from entering into drainage area.

					• Appropriate water management, sediment and erosion control measures will be designed for roads and tracks that may be constructed.
Soil and water contamination by hydrocarbons and waste	Moderate	Possible	Medium term	Regional	• Topsoil must not be contaminated with oil, grease, diesel, etc. which may inhibit the later growth of vegetation. • All chemicals, fuels and oils to be stored on site will be approximately stored in sealed containers and placed on lined area. • Equipment to be inspected daily for leaks. Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and underground water contamination. • No vehicle will be extensively repaired on site. • All equipment and vehicles must be adequately maintained so that during operations it does not spill oil, diesel, fuel, etc.

					• Any contaminated soil will be collected into non-permeable bags and disposed of at an approved landfill site. • Ensure that hazardous waste is disposed of at a licensed waste disposal facility. Proof of disposal certificates/waybills are to be kept for auditing purposes. • Burning of waste on-site shall be prohibited. • Major oil or fuel spills to be reported to the North West Department of Water Affairs and all the relevant local authorities. • Used oil is to be collected by a licensed contractor. • A portable chemical toilet will be used on site and will be used in such a way as to prevent soil and underground water pollution. Full or leaking toilets must be reported to the supervisor for corrective action or replacement. • All waste to be placed within a skip that shall be collected by the Moses Kotane Municipal services.

					• No activities are to be established within 100m of any watercourse or wetland.
Interference with current land uses	Moderate	Definite	Medium term	Site	• The area to be disturbed will be kept to a minimum (not exceeding 200mx200m). • No excavation will be established within 50m of any agricultural land unless consent is received from the land owner. • No excavation site will be established within 100m of any water body.
Fauna and flora loss	Moderate	Definite	Medium term	Regional	• Additional access tracks will be located in areas that will result in minimal ground disturbance. • A field survey will be undertaken before mining activities commences to confirm whether there are no threatened species or ecologically sensitive areas are present in sections to be cleared. • Permission will be obtained from the land owner before trees are felled, should it be necessary. • All trees protected in terms of National Forest Act, 1998, will be protected- will not be cut, disturbed, damaged, removed, etc.

Disturbance/ damage of heritage site	Moderate	Possible	Permanent	Footprint	According to desktop studies and site survey done, there are no heritage site on the proposed area, but should heritage sites be discovered during mining activities, relevant authorities shall be notified and action thereof shall be taken under their advisement.
Reduction of water sourced on site	Moderate	Possible	Long term	Regional	• A mobile water cart will be used to transport water to the site. • Drinking water will be supplied in plastic containers to be stored on site.
Further reduction in air quality	Moderate	Highly likely	Medium term	Regional	• All machinery will be fitted with appropriate dust suppression equipment like water sprays where possible. • Speed limits on gravel roads will be limited to 40km/hr to minimize dust generation. • Excavation, handling and transportation of erodible materials should be avoided during a period of excessive wind.
Noise pollution	Moderate	Definite	Medium term	Regional	• All machinery will be fitted with appropriate noise suppression equipment like mufflers.

					• Modern, low noise emission vehicles and equipment will be favored. • All equipment on site will be maintained in good working order. • Operations will be restricted to day light hours. • Speed limits on gravel roads will be limited to 40km/hr to minimize noise generation.
Possible introduction of invasive and alien species	Moderate	Likely	Long term	Regional	• Machinery will be cleared of mud and seeds prior to relocation to the next site to prevent the spread of alien invasive species. • An inspection of whether there is evidence of alien and invasive species as a result of mining activities will be undertaken and removed if required. • As a maintenance measure through-out the project life, alien species management must be done.
Improper waste management	Moderate	Likely	Long term	Site	• All waste to be placed within a skip that shall be collected by the Moses Kotane Municipal services. • Bins to be provided in a secure location.

					• Ensure that hazardous waste is disposed of at a licensed waste disposal facility. Proof of disposal certificate/waybills are to be kept for purposes. • Burning of waste on-site shall be prohibited. • Major oil or fuel spills to be reported to the North West Department of Water Affairs and all the relevant local authorities. • Used oil is to be collected by a licensed contractor.
Socio-economic: jobs and business expectations	High	Highly likely	Long term	Regional	There will be various job and business opportunities for locals. This will help alleviate poverty as locals will have an income.

11. Methodology used to determine and rank the potential environmental impacts and risks

The significance of the impacts was determined through the consideration of the following criteria:

Table 6: Methodology Criteria

Probability	Provides a description of the likelihood/probability of the impact occurring
Extent	Describes the spatial scale over which the impact will be experienced
Duration	The period over which the impact will be experienced
Intensity	The degree/order of magnitude/severity to which the impact affects the health and welfare of humans and the environment
Significance	Overall significance of the impact on components of the affected environment and whether it is a negative or positive impact

The impacts were individually described and assessed using the criteria drawn from the Environmental Impact Assessment (EIA) Regulations, published by the DEA in terms of the NEMA (Act 107 of 1998).

The significance of each impact is assessed using the following formula (before and after mitigation):

Significance Point (SP) = (Probability + Extent + Duration) x Intensity

The maximum value is 150 SP. The impact significance will then be rated as follows:

Table 7: Significance criteria

SP > 75	Indicate high environmental significance	An impact that could influence the decision about whether or not to proceed with the project regardless
SP 30-75	Indicates moderate environmental significance	An impact or benefit which is sufficiently important require management and which could have an influence on the decision unless it is mitigated
SP < 30	Indicates low environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design
+	Positive impact	An impact that is likely to result in positive consequences/effects

Table 8: Probability criteria

		Probability (P)
None (N)	1	The possibility of the impact occurring is none, due to either the circumstances, design or experience (0%)
Possible (P)	2	The possibility of the impact occurring is very low, due to either the circumstances, design or experience (25%)
Likely (L)	3	There is a possibility that the impact will occur to the extent that provisions must therefore be made (50%)
Highly likely (H)	4	It is more likely that the impact will occur at some stage of the development and plans must be drawn up before carrying out the activity (75%)
Definite (D)	5	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on (100%)

Table 9: Extent Criteria

		Extent(E)
Footprint (F)	1	The impact area extents only as far as the activity which occurs within the total site area
Site (S)	2	The impact could affect the whole site or the significant portion of the site
Regional (R)	3	The impact could affect the area including the neighboring farms, transport route and/or the adjoining towns
National (N)	4	The impact could have an effect that expands throughout the country
International (I)	5	Where the impacts has international ramifications that extends beyond the boundaries of the country

Table 10: Duration criteria

Duration (D)- The period over which the impact will be experienced		
Temporary (T)	1	0-3 years (or confined to the construction period)
Short term (S)	2	3-11 years (or confined to the construction and part of the operational period)
Medium term (M)	3	10-15 years (or confined to the construction and whole operational period)
Long term (L)	4	For the whole life of mine (including closer and rehabilitation period)
Permanent (P)	5	Beyond the anticipated lifetime of the project

Table 11: Intensity criteria

		Intensity (I)
Insignificant (I)	2	Will have no or very little impact on the health and welfare of humans and environment
Low (L)	4	Will have a slightly impact on the health and welfare of humans and environment
Moderate (M)	6	Will have a moderate impact on the health and welfare of humans and environment
High (H)	8	Will have significant impact on the health and welfare of humans and environment
Very high/don't know (V)	10	Will have severe impact on the health and welfare of humans and environment

12. The positive and negative impacts of the proposed activity

Positive Impacts

- Socio-economic

  Some of the workers will be employed from the community and the community will be given first preference with regard to employment criteria. Training will be given to the workers meaning that some of the community members will gain skills from the proposed mining activities.

Negative impacts

- Noise generation: The movement of the machinery and mining activities generate noise, although the noise level are between the tolerable ranges. Criminal activity: The machinery on-site will attract criminal activity but 24 hour will be put in place to safe guard all the machinery on-site
- Soils: Physical disturbance of soils during land clearing for the quarry

- Dust emissions: Dust emitted could be a nuisance but it is negligible in this case because minimal dust will be emitted
- Waste generation: All waste generated on-site will be disposed of at registered landfill site.
- Biodiversity: Destruction and loss of indigenous plant species during site preparation and the establishment and spread of declared weeds and alien plant species
- Underground water contamination: During mining it is possible that underground aquifers may be encountered and underground water could possibly be contaminated.
- Potential visual impact
- During mining, livestock will be prohibited from grazing within the site, as the site will be fenced off. Alternative grazing site for livestock will be needed. Rehabilitation will ensure that post mining activities, the site will be returned to its former livestock grazing area
- Noise during operational activities: Noise generation is likely to be one of the biggest impacts during mining operation. All efforts will be made to reduce noise level via the use of efficient, well maintained equipment and the location of any noise generating equipment are in noise checked areas or at distant locations from sensitive receptors
- Influx of people (job seekers) to site as a result of increased activity and the possible result of increased opportunistic crime
- Presence of hazardous material on. Limited quantities of dangerous goods (fuel, oil and lubricants) will be stored on site. The transportation, handling and storage of such materials may result in spills and underground water quality impact.

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

A public and landowners meeting is yet to be held.

12.2. Motivation where no alternative sites were considered.

No alternative land use has been proposed for the area applied for. Locating the development to another area will result in the ore possibly not being found and the economy and society not benefitting from future proposed mining activities. The no-go option implies that the mineral resources proven to be on the ground will be sterilized if not mined. This can be regarded as an economic opportunity loss.

12.3. Statement motivating the alternative development location within the overall site.

The site for the mining is motivated by the need to improve the lives of residents of the village, which is currently faced with poverty due to high unemployment rate. Through this project the poverty will be alleviated. The proposed mining site is preferred as it is situated on the right spot that has high grade of chrome and aggregate stones.

13. Full description of the process undertaken to identify, assess and rank the impact and risks of the activity.

IMPACT ASSESSMENT METHODOLOGY

In order to ensure uniformity, a standard impact assessment methodology will be utilised so that a wide range of impacts can be compared. The impact assessment methodology makes provision for the assessment of impacts against the criteria defined in previous sections.

The impact assessment is divided into three distinct phases, namely:

1. Site establishment:
2. Operational phase (excavating, screening and crushing)
3. Decommissioning phase

13.1. Site Establishment

13.1.1. Cultural and Heritage Resources

Site establishment entails clearing a maximum surface area that will cater for scooping the soil. This activity has the potential to impact on heritage artefacts, heritage sites and graves. The following measures should reduce the significance of the cultural and heritage impacts from a moderate (48(M)) to a low (28(L)):

- Based on literature reviewed and a site survey, no heritage or cultural resources were identified on site. If it happens that a heritage resources is discovered during the course of the project all site activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess the significance and determine appropriate mitigation measures. This may include obtaining an authorisation from SAHRA to conduct mitigation measures.
- A distance of at least 50 metres will be maintained between any identified heritage resources and the construction activities. The heritage feature will be cordoned off with stakes and chevron tape.

13.1.2. Soil and vegetation disturbance

The impact resulting from clearing and compaction is expected to have a potential impact of a moderate (60(M)) and is expected to reduce to a moderate (40(M)) after the implementation of the following mitigation measures:

- The soil disturbance and clearance of vegetation will be limited to the absolute minimum required.

- Disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
- No clear scraping (dozing) be carried out unless absolutely necessary. Rather that surface vegetation be cleared to make way for the machinery leaving the roots intact so that vegetation can coppice and regrow.

13.1.3. Soil, surface water and groundwater contamination

The following measures should reduce the significance of the potential impacts from moderate (64(M)) to a low (28(L)):

- Proper vehicle maintenance;
- Refuelling will be done with care to minimise the chance of spillages;
- A spill kit will be available on site.
- Any spillages will be cleaned up immediately.

13.1.4. Friction between local residents/landowners and construction personnel

The mining site will be located in a rural area. Local residents cherish the peace. Therefore friction between local residents and contractors may result in conflict, however due the operational mines within the area, the community and contractors are getting along. The following measures should reduce the potential for conflict between mining personnel and local residents from a moderate (36(M)) to a low (18(L)):

- All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution;

- The area is already characterised as a mining area because there are numerous collieries close to the proposed mining area.
- When it comes to employment and business opportunities, locals will be preferred over people from other areas, unless there is a certain skill that cannot be sourced from locals then people from other areas will be considered.

13.1.5. Dust fall

The following measures should reduce the significance of the potential dust fall impacts from low (24(L)) to low (16(L)):

- Acceptable dust fall out rates in terms of the National Dust Control Regulations (GN R.827 of 1 November 2013), will be followed.
- Low vehicle speeds will be enforced on unpaved surfaces.
- A separation distance of a minimum 500m, but preferably 1000m should be maintained between mining sites and dwellings as far as possible.
- Wet suppression will be applied to ensure that no visible dust is raised by any of the mining operations.

13.1.6. Visual

The area is already characterised by old mine diggings, active mines and mine dumps so the visual aspect of the area is already relatively distorted. The visual impact of the construction / setup activities is assessed as being a low (28(L)) before mitigation. The impact can be reduced to a low (14(L)) by:

- Consideration of the location of visual receptors; and

- Positioning the mining area in a way that it is screened where ever possible.

13.2. Operational Phase

The equipment and vehicles, where ever possible, will be confined to established roads and tracks. Where this is not possible, access routes will be walked prior to entry of equipment to ensure that there are no resources of cultural or heritage significance. Should any be identified, the access route will be realigned to avoid such heritage resources, which will then be clearly marked with stakes and chevron tape to minimise risk of accidental damage:

13.2.1. Cultural and Heritage Resources

Site establishment entails clearing a maximum surface area that will cater for scooping the stones. This activity has the potential to impact on heritage artefacts, heritage sites and graves. The following measures should reduce the significance of the cultural and heritage impacts from a moderate (48(M)) to a moderate (32(M)):

- Based on literature reviewed and a site survey, no heritage or cultural resources were identified on site. If it happens that a heritage resources is discovered during the course of the project all site activities will cease with immediate effect and a qualified archaeologist will be commissioned to assess the significance and determine appropriate mitigation measures. This may include obtaining an authorisation from SAHRA to conduct mitigation measures.
- A distance of at least 50 metres will be maintained between any identified heritage resources and the construction activities. The

heritage feature will be cordoned off with stakes and chevron tape.

13.2.2. Soil and vegetation disturbance

The impact resulting from clearing and compaction is expected to have a potential impact of a moderate (66(M)) and is expected to reduce to moderate (40(M)) after the implementation of the following mitigation measures:

- The soil disturbance and clearance will be limited to the absolute minimum required.
- Disturbed areas will be re-vegetated with locally indigenous species as soon as possible.
- No clear scraping (dozing) be carried out unless absolutely necessary. Rather that surface vegetation be cleared to make way for machinery leaving the roots intact so that vegetation can coppice and regrow.

13.2.3. Soil, surface water and groundwater contamination

The following measures should reduce the significance of the potential impacts from a moderate (64(M)) to a low (28(L)):

- Proper vehicle maintenance;
- Refuelling will be done with care to minimise the chance of spillages;
- Any hazardous waste material will be removed from site and disposed in a licensed disposal facility;
- A spill kit will be available on site.
- Any spillages will be cleaned up immediately.

13.2.4. Erosion from clearing of excavation sites and movement along access tracks

The following mitigation measures should reduce the significance of the potential impacts from a moderate (54(M)) to a low (28(L)):

- Sediment and erosion controls will be designed to prevent runoff from the quarry area into the drainage areas.
- Appropriate water management, sediment and erosion control measures will be designed for roads and tracks that may be constructed.
- Rehabilitation of excavated and disturbed areas will take place.

13.2.5. Potential negative impact on a protected area

The following mitigation measures should reduce the significance of the potential impacts from a moderate (64(M)) to a low (28(L)):

- No mining activities will be permitted within any protected area.
- No-go/ protected areas will be fenced off to prevent access to the area by any personnel.

13.2.6. Friction between local residents/landowners and construction personnel

The mining site will be located in a rural area. Local residents cherish the peace. Therefore friction between local residents and contractors may result in conflict, however due the operational mines within the area, the community and contractors are getting along. The following measures should reduce the potential for conflict between mining personnel and local residents from a moderate (36(M)) to a low (18(L)):

- All operations will be carried out under the guidance of a strong, experienced manager with proven skills in public consultation and conflict resolution.
- The area is already characterised as a mining area because there are numerous collieries close to the proposed mining area

13.2.7. Dust fall

The following measures should reduce the significance of the potential dust fall impacts from a moderate (54(M)) to a moderate (32(M)):

- Acceptable dust fall out rates in terms of the National Dust Control Regulations (GN R.827 of 1 November 2013), will be followed.
- Low vehicle speeds will be enforced on unpaved surfaces;
- A separation distance of a minimum 500m, but preferably 1000m should be maintained between the excavated site and dwellings as far as possible; and
- Wet suppression will be applied to ensure that no visible dust is raised by any of the mining operations.

13.2.8. Possible introduction of invasive and alien species

The following measures should reduce the significance of the potential impact from a moderate (40(M)) to a low (28(L)):

- Machinery will be cleared of mud and seeds prior to relocation to the next site to prevent the spread of alien invasive species.
- An inspection on whether there is evidence of alien and invasive species as a result of mining activities will be undertaken and removed if required.
- A maintenance plan to regularly remove invasive species on site will be implemented.

13.2.9. Visual

The area is already characterised by old mine diggings, active mines and mine dumps, so the visual aspect of the area is already relatively distorted. The visual impact of the construction / setup activities is assessed as being a low (28(L)) before mitigation. The impact can be reduced to a low (14(L)) by:

- Consideration of the location of visual receptors.
- Positioning the mining area in a way that it is screened where ever possible.

13.2.10. Noise

Taking into account the existing background noise levels of the general area which is rural in nature, the significance of the noise caused by mining activity, vehicles going to and from each site and the voices of the mining crew, the impact is assessed as being a moderate (60(M)) before mitigation. The impact can be reduced to a moderate (32(M)) post mitigation. Intended mitigation measures include:

- Limiting the mining activities to daylight hours (06h00 to 18h00);
- Not undertaking activities on Saturday and Sundays and public holidays;
- Applying a separation distance between excavation sites and any sensitive receptors (500m minimum);
- The speed limit for driving within a community shall be limited to 60km/h and 40km/h within the mining site.

13.3. Decommissioning phase

Decommissioning will take place immediately after each work has been completed.

Assessment of potential cumulative impacts

The cumulative impact assessment considers a scenario where more than one excavator and excavation site is in operation at any point in time throughout the duration of the mining programme, which will not happen.

13.3.1. Noise

The noise impact of the proposed mining operations on sensitive receptors is assessed as being a low (12 (L)) prior to mitigation and a low (10(L)) post mitigation.

13.3.2. Visual

The cumulative visual impact on sensitive receptors is assessed as being a low (10(L)) prior to mitigation and a low (6(L)) post mitigation.

13.3.3. Dust fall

The impact of dust generation on sensitive receptors is assessed as being a medium (32(M)) prior to mitigation and a low (24(L)) post mitigation.

13.3.4. Soil, surface water and groundwater contamination

The impact of soil, surface water and groundwater contamination experienced by sensitive receptors is assessed as being a low (28(L)) prior to mitigation and a low (14(L)) post mitigation.

14. Assessment of each identified potential significant impact and risk

Table 12: Assessment of each identified potentially significant impact and risk of all the planned activities.

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE (Not mitigated)	MITIGATION TYPE	SIGNIFICANCE (If mitigated)
Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation)	Compaction- from movement of heavy machinery	Soil	All phases	Moderate	• Existing roads and tracks will be used as far as possible. • New access tracks will be kept to a minimum. • Rehabilitation of disturbed areas will take place.	Moderate
	Contamination - from diesel, oil grease, etc., used for the mining machinery and from maintenance of machinery	Soil	All phases	Moderate	• Topsoil must not be contaminated with oil, grease, diesel, etc., which may inhibit the later growth of vegetation.	Low

	conducted on site				• All chemicals, fuels, and oils will be appropriately stored in sealed containers and placed on a lined area. • Inspect equipment daily for leaks. Machinery and equipment will only be maintained over a drip tray, a thin concrete slab or a PVC lining to prevent soil and water contamination. No vehicle will be extensively repaired on site. • All equipment and vehicles must be adequately maintained so that during	

					operations it does not spill oil, diesel, fuel, etc. • Any contaminated soil will be collected into non-permeable bags and disposed of at an approved landfill site.	
	Contamination - from domestic waste and sewage	Soil	All phases	Moderate	• A chemical toilet will be used on site and will be used in such a way as to prevent water pollution. Full or leaking toilets must be reported to the supervisor for corrective action or replacement. • Rehabilitation of boreholes and disturbed areas will take place.	Low
	Erosion from clearing of excavation	Soil	All phases	Moderate	• Sediment and erosion controls will be designed	Low

	sites and movement along access tracks				to prevent runoff from the quarry area into the drainage areas. • Appropriate water management, sediment and erosion control measures will be designed for roads and tracks that may be constructed. • Rehabilitation of boreholes and disturbed areas will take place.	
	Potential introduction of alien and invasive species	Soil	All phases	Moderate	• Machinery will be cleared of mud and seeds prior to relocation to the next site to prevent the spread of alien invasive species.	Low

					• An inspection on whether there is evidence of alien and invasive species as a result of mining activities will be undertaken and removed if required.	
Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation))	Loss of topsoil- when excavation site is cleared of vegetation.	Soil	All phases	Moderate	• Any removed topsoil will be kept to one side and protected from being blown away or being eroded. • Rehabilitation of boreholes and disturbed areas will take place.	Moderate
	Current land use on site	Land use	All phases	Moderate	• The area to be disturbed will be kept to a minimum. • No excavation site will be established within	Low

					50m of any agricultural land unless consent is received from the land owner. • Rehabilitation of the quarry and any disturbed areas will take place.	
	Fauna and flora currently on site	Biodiversity (fauna and flora)	All phases	Moderate	• A field survey will be undertaken before any excavating commences to confirm that no threatened species or ecologically sensitive areas are present in sections to be cleared. • Permission will be obtained from the landowner before any	Moderate

					cultivated plants shall be cleared. • Rehabilitation of the quarry and any disturbed areas will take place.	
	Contamination - from diesel, oil grease, etc., used for the mining machinery and from maintenance of machinery conducted on site	Surface and ground water	All phases	Moderate	• The excavation will be established within 100m of any water course or wetland. • All chemicals, fuels, and oils to be stored on site will be appropriately stored in sealed containers and placed on a lined area. • All waste will be collected, separated and stored properly in containers with lids and	Low

					removed to an approved landfill. • Inspect equipment daily for leaks. Machinery and equipment will only be maintained over a drip tray, a thin slab or a PVC lining to prevent soil and water contamination. No vehicle will be extensively repaired on site. • All equipment and vehicles must be adequately maintained so that during operations it does not spill oil, diesel, fuel, etc. • Any contaminated soil will be collected into	

					non-permeable bags and disposed of at an approved landfill site. • A chemical toilet will be used on site and will be used in such a way as to prevent water pollution. Full or leaking toilets must be reported to the supervisor for corrective action or replacement.	
	Potential water availability to other users- water sourced on site	Surface and ground water	All phases	Moderate	• A mobile water cart will be used to transport water to the site from a registered water user. • Drinking water will be supplied in plastic containers to be stored on site.	Low

Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation)	Potential heritage sites may be disturbed and/or damaged	Heritage sites	All phases	Moderate	• Potential heritage sites will be identified during the planning of borehole locations and demarcated. • Access to these sites will then be limited and all workers will be notified to keep at least 100m away from these sites.	Low
Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation)	Potential minimal dust may be caused	Air quality (dust)	All phases	Moderate	• All machinery will be fitted with appropriate dust suppression equipment like water sprays, where possible. • Speed limits on gravel roads will be limited to 40km/h to minimise dust generation.	Low

					• Dust will be effectively controlled in all disturbed areas through water spraying. • Excavation handling and transportation of erodible materials should be avoided during periods of excessive wind. • If necessary, other appropriate dust suppression techniques will be administered. For example, chemicals, wind fencing, covering of surfaces and vegetation of open areas.	

Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation)	Potential noise mining activities	Noise	All phases	Moderate	• All machinery will be fitted with ideal noise suppression equipment such as mufflers. • All equipment on site will be maintained in good working order. • Mining will be restricted to day light hours. • Speed limits on gravel roads will be limited to 40km/h to minimise noise generation.	Low

15. Summary of specialist reports

Table 13: Summary of specialist reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVES BEEN INCLUDED
N/A	N/A	N/A	N/A

16. Environmental impact statement

16.1. Summary of the key findings of the environmental impact assessment

It is recognized that the proposed mining activities could potentially pose various risks to the environment as well as to the residents or businesses in the surrounding area. Therefore, it is important that these possible risks and key issues are identified on the BAR compilation. These impacts, issues and risks were addressed within land owners consultations and meetings.

The assessed impact ratings after implementation of the mitigation measures described above are as follows:

- Cultural and heritage significance – low (28(L))
- Noise significance; – low (28(L))

- Visual impact significance; – low (14(L))
- Dust fall significance; – low (28L))
- Disturbance of soil and vegetation – moderate (32(M))
- Contamination of soil – low (28(L))
- Surface water and groundwater contamination – low (28(L))
- Friction (local residents vs mine personnel) – low (18(L)).
- Erosion – low (28(L))
- Invasive and alien species introduction –low (28(L))
- Current land-use – low (20(M))
- Fauna & Fauna – moderate (36(M))

Most of the identified impacts will occur for a limited period and the extent of the impacts will be localized. All of the identified impacts can be suitably mitigated with the residual impact ratings being of low significance. Post mining activities almost all the impacts will cease to exist due to effective rehabilitation.

16.2. Summary of the positive and negative impacts and risks of the proposed activity

Table 14: A summary of the impacts of the proposed activity:

Impact Description	Significance before Mitigation	Significance after Mitigation
Compaction- from movement of heavy machinery	Moderate	Moderate
Contamination- from diesel, oil, grease, etc., used for the machinery and from maintenance of machinery conducted on site	Moderate	Low
Loss of topsoil- when the quarry site is cleared of vegetation	Moderate	Moderate

Erosion from clearing of the quarry sites and movement along access tracks.	Moderate	Low
Potential introduction of invasive and alien species.	Moderate	Low
Current land use on site	Moderate	Low
Fauna and flora currently on site	Moderate	Moderate
Potential water discharge- during excavation of the quarry	Moderate	Low
Potential water availability to other users- water sourced on site	Moderate	Low
Potential heritage sites may be disturbed and/or damaged.	Moderate	Low
Potential dust fall	Moderate	Low
Potential noise from mining related activities	Moderate	Low

17. Proposed impact management objectives and the impact management outcomes

The impact management objectives:

- Provide enough information to plan the mining activities as to avoid unnecessary social and environmental impacts accordingly.
- Provide enough information and guidance to plan mining activities in a manner that would reduce impacts (both social and environmental) as far as practically possible.
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.
- Provide a management programme that is effective and practical for implementation.

Through the implementation of the proposed mitigation measures it is anticipated that the identified social & environmental impacts can be managed and mitigated effectively. Through the implementation of the mitigation and management measures it is expected that:

- Heritage/cultural resources can be managed by avoiding known resources and through consultation with landowners/stakeholders.

These areas will be cordoned off and marked as no-go areas. Site workers will be informed of these no-go areas and that there will be consequences of any damage/removal of such features.

- Noise generation can be managed via restriction of operating hours, by ensuring that all equipment is regularly maintained and by applying specialised noise abatement equipment if necessary.
- Dust fall can be managed by application of wet suppression on exposed surfaces and use of water during excavation.
- Soil disturbance and clearance of vegetation will be limited to the absolute minimum required and disturbed areas will be re-vegetated with local indigenous species as soon as possible.
- Killing of any animals on-site will be strictly prohibited.
- Social friction with landowners can be managed by employing strong, experienced personnel with proven skills in public consultation and conflict resolution during stakeholder consultation phases. All mining personnel will be made aware of the local conditions and sensitivities in the mining area and that they treat local residents with respect and courtesy at all times.
- Various job opportunities will be created during the mining activities and that will temporarily contribute to the local economy.

18. Aspects for inclusion as conditions of Authorisation

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

In authorising the proposed Stanley Masinga project, the following conditions should form a part of the environmental authorisation:

- The EMPr must be fully implemented at all stages of the proposed project.

- A buffer zone of 100m from and around any water body.
- There will be no altering of any project activities locations that have been included in this basic assessment report without obtaining the required environmental authorisation to do so under NEMA.
- No new activity that has not been included within this basic assessment report will be undertaken because it could potentially trigger the need for an environmental authorisation.
- Specialist studies, management procedures and method statements will be undertaken should the need arise.
- Mining activities will be restricted to the daytime. If it so happens that night-time operations are to be done, this should be conducted only on agreement with the land-owners and affected parties.
- Dust emissions will be kept within allowable limits.
- Health and safety of employees will be ensured.
- A buffer zone of 100m around heritage sites, including any structures older than 60 years and graves should be maintained.
- A buffer zone of 500m from or around any residential infrastructure should be maintained.
- All waste generated must be disposed of at an appropriate registered landfill and a disposal certificate should be kept on-site.
- The servitudes of all buried telephone lines, pipelines, powerlines and other public utilities should be maintained.
- Invasive and exotic plant species should not be allowed to establish through-out the life-span of the project.

19. Description of any assumptions, uncertainties and gaps in knowledge

All technical data and/or information provided by the proponent are accurate and up to date and no information that could change the outcome of the authorisation process has been withheld.

Due to the brief nature of the site visits conducted at the study area, this assessment is based largely on our understanding of physical and ecological setting based on available literature and on information that has been gathered.

Contractors will implement the measures contained in the BAR and EMPr and both the BAR and EMPr will be revised and updated to include requisite studies, plans, method statements and operational procedures prior to the commencement of construction and operational activities.

A monitoring and evaluation system and procedures, including auditing, will be established and operationalized to track the implementation of the EMPr in order to ensure that management measures are effective and that corrective actions are undertaken to address any shortcomings and non-performance or non-compliance.

Limitations an uncertainties

- All information provided to the environmental team by the applicant and I&APs was correct and valid at the time that it has been provided;
- It is not always possible to involve all I&APs individually, however every effort has been made to involve as many affected stakeholders as possible;
- The scope of this investigation is limited to assessing the environmental impacts related to the construction, operation and decommissioning of the proposed chrome and aggregate stones mining project.

20. Reasoned opinion to authorise or not to authorise the proposed activity

This activity should be granted a positive environmental authorisation. Section 12 of the MPRDA 2002 states "The holder of a permit or authorisation remains

liable for complying with the relevant provisions of Act until the Regional Director has issued to him a certificate to the effect that he has compiled with the said provisions". The EAP is under the opinion that the applicant has complied with these provisions.

The environmental impacts related to the mining activities are minimal provided that the proposed mitigation measures are implemented. With necessary consideration, the impacts resulting from mining can be suitably avoided, minimised or mitigated. By implementing the relevant rehabilitation activities, the impacts related to mining activities can be reversed effectively.

The risks that have been identified can be mitigated. A bank guarantee will be provided, indicating that provision will be made for the rehabilitation in the proposed area. Activity should be granted with the conditions that the applicant implements the recommendations that have been provided in the risk assessment report. By allowing the implementation of mining activities, the knowledge regarding the potential mineral resource within the mining area will be confirmed.

21. Period for which the Environmental Authorisation is required

The Environmental Authorisation must be valid until the mining closure certificate has been received by the applicant.

22. Specific Information required by the Competent Authority

22.1. Impact on the socio-economic conditions of any directly affected person.

Landowners and some affected parties are to be consulted.

22.2. Impact on any natural estate referred to in section 3(2) of the National Heritage Resources Act

National estates referred to in Section 3(2) of the National Heritage Resources Act (NHRA) include:

(i) graves and burial grounds, including-
(ii) ancestral graves;
(iii) royal graves and graves of traditional leaders;
(iv) graves of victims of conflict;
(v) graves of individuals designated by the Minister by notice in the Gazette;
(vi) historical graves and cemeteries; and
(vii) other human remains which are not covered in terms of the Human Tissue Act, 1983 (Act No. 65 of 1983) [note replaced by the National Health Act].

With relevance to above stated there are no historical or cultural sites which were identified. In case any human remains are excavated during operation, work will be stopped and a report made to the police and SAHRA for removal of the human remains. Furthermore, from desktop studies undertaken, no heritage states have been identified to occur in the area; however these need to be confirmed by site surveys. There is no sensitive cultural or historical aspects directly on the site which can or be impacted by the proposed activity and the site is not of any cultural significance.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

23. Description of Impact Management objectives including management statements

23.1. Determination of closure objectives.

The closure process involves a series of actions executed over a number of years with continual monitoring, review and remedial actions identified as assessed risks feed into mitigation actions of which successful implementation results in achievement of the mine closure objectives.

The objectives of the closure and rehabilitation process are to ensure that:

- Safety risks associated with excavating and scrapping are eliminated.
- Removed and/or rehabilitate all pollution and pollution sources such as waste materials and spills.
- To establish rehabilitated area which is not subject to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources; and
- Restore disturbed area and re-vegetate these areas with grass species naturally occurring in the area to restore the ecological function of such areas as far as is practicable.
- Development of an environmental monitoring and reporting program which is focused towards demonstrating the achievement of closure outcomes.

23.2. Volumes and rate of water use required for the operation

The water that will be used for the mining activities will be sourced on agreement from an existing authorised water user. No water will be abstracted in terms of section 21(a) of National Water Act, 1998 (Act no. 36 of 1998).

24. Impacts to be mitigated in their respective phases and measures to rehabilitate the environment affected by the undertaking of listed activities.

Table 15: Impacts to be mitigated in their respective phases

ACTIVITIES	PHASE	SIZE AND SCALE OF DISTURBANCE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Data collection and Assessment (Desktop Study)	Planning		Non-invasive, therefore no mitigation proposed.		N/A
Data Assessment	Planning	Entire Property	Non-invasive, therefore no mitigation proposed.		N/A

Mining (Excavation, Crushing, Screening, Stockpiling, Loading and Transportation.)	All phases		• Vegetation clearance should be as minimal as possible. • No striping of topsoil or clearing of vegetation will be required. • Dust will be suppressed at all times. Dust nuisance will be assessed visually and complaints assessed and addressed. • All designated footprint areas will be secured and demarcated at all times while in use. • All areas outside of the authorised foot should be regarded as no-go areas for ant staff members.	All recommendations and mitigation measures will ensure the preservation of the topsoil in order for it to be used for rehabilitation and assist in reducing any environmental degradation.	During site establishment, operations and decommissioning.

			• Vegetation clearing shall not only take place when the individual site is to commence with excavation, in order to retain vegetation cover for as long as possible. This would reduce the size of areas where dust can be generated to avoid erosion limiting the exposure of sediment runoff. • Site clearance will encourage the introduction of alien invasive plant species. Cleared areas are to be surveyed for invasive species regularly and cleared of any invasive species.		

			• During the process of stripping, topsoil care should be taken to ensure that no topsoil is contaminated with oil and grease, foreign material or alien plants. The topsoil will be stored in a manner that will prevent any loss of topsoil via the natural elements. Topsoil is not to be double handled it is to be stripped, stockpiled then once the area has neem prepared for rehabilitation, the topsoil will be replaced in its original position.		
Mining (Excavation, Crushing, Screening,	All phases		• A suitable sub-contractor shall be appointed to maintain the portable toilets on a regular basis. No	All recommendations and mitigation	During site establishment, operations and

Stockpiling, Loading and Transportation.)			noxious smells must emanate from these facilities and the presence of vectors should be addressed, when noticed. • Ensure that the use of machines does not disrupt any services (i.e. electricity poles, water and telephone lines). • All machinery and equipment must be maintained in good working order and fitted with approved and specified muffler systems. Daily checks are to be undertaken on all plant and equipment to monitor the status of the equipment. If any	measures will ensure little to no permanent impact on the environment, moreover, this will ensure effective rehabilitation and restoration.	decommissioning.

			equipment is faulty it is to be removed to a designated area and repaired or replaced as soon as reasonably possible (within 24 hours if possible) of the identification of the fault. • Compliance with local by-laws and regulations regarding the noise, dust and hours of operation is to be strictly adhered to. • All sites disturbed by mining activities must be monitored for exotic or alien invasive plant species and weeds.		
Decommissioning and Rehabilitation	Decommissioning and Rehabilitation		• Compliance with local by-laws and regulations regarding the noise and hours of operation.	All of the mitigation measures are followed then	During decommissioning phase

			• Avoid working outside normal working hours and during weekends. • All vehicles should comply with the 40km/h speed limit on site. • During rehabilitation, the topography would be finished off to blend in with the surrounding environment. • The area is to be cleared of all foreign objects, materials and alien plants. • Once the area is shaped correctly the compacted areas are to be lightly ripped to 300mm before topsoil is to be replaced.	the area will be in a position where the environment has been protected and rehabilitation will be smooth and effective.	

			• Areas that have not had topsoil stripped are to be monitored for alien plant growth and vegetation recovery.		

25. Financial Provision

25.1. Describe the closure objectives and their alignment extent to the baseline environment.

The objectives of the closure and rehabilitation process are to ensure that:

- Concurrent rehabilitation will be done in line with mining activities.
- Remove and / or rehabilitate all pollution and pollution sources such as waste materials and spills.
- To establish rehabilitated area which is not subject to soil erosion which may result in the loss of soil, degradation of the environment and cause pollution of surface water resources.
- Restore disturbed area and re-vegetate these areas with grass species naturally occurring in the area to restore the ecological function of such areas as far as is practicable.
- Development of an environmental monitoring and reporting program which is focused towards demonstrating the achievement of closure outcomes.

- All evidence of activities will be removed.
- The site will be inspected by the Geologist, a DMR Official and an Environmental Assessment Practitioner.

25.2. Confirm that landowners and I&APs have been consulted regarding the environmental closure objectives.

This Basic Assessment Report and Environmental Management Programmes has been made available registered stakeholders for review and comment. No comments have been received as yet.

25.3. Rehabilitation Plan

(A) General Requirements

The objective of rehabilitation is to restore the site to an acceptable satisfactory condition by;

1. Eliminating unacceptable health hazards and ensuring public safety.
2. Restoring the site to a condition that is visually acceptable to the community.
3. Reclaiming the areas impacted for future use (i.e. agricultural)
4. Preparing the site to be amenable to support vegetation
5. Removing any contaminated soils
6. Ensuring physical stabilization of the soils (a combination of smoothing and contouring slopes, replacing overburden and topsoil and revegetating).
7. Ensuring that final drainage of the site does not adversely affect neighbouring communities.

(B) Rehabilitation Plan

- The final Slopes in all excavations shall be at an angle that is suitable to minimize the possibility of slides and be consistent with the future use land.
- The land will be cleared of rubbish, surplus materials, temporary structures and equipment, and all parts of the land shall be left in a condition as close as possible to that prior to use.
- Provisions for safety to persons, animals and to adjoining property must be provided.
- All overburden and spoil shall be left in a configuration which is in accordance with accepted conservation practices and which is suitable for the proposed subsequent use of the land.
- Suitable drainage ditches or conduits shall be constructed or installed to avoid conditions where small pools of water that are, or are likely to become noxious, or foul, collect or remain on the mined area. Ponds shall be considered adequately reclaimed lands when approved by the Department subject to the approval of all other stakeholders. Surface drainage must be designed to minimize erosion during runoff and major rainfall events.
- Pits shall be backfilled with clean or inert fill. There shall be no material of deleterious nature (i.e. any material that would be classed as hazardous or waste).
- The site shall be graded to match or blend with existing contours. In the case of hard rock pits the area should be multi-benched.
- Topsoil stripped from the surface shall be used for final cover to re-contour slopes where practicable. Non-usable material including overburden, screenings and rocks, should be placed in the pit bottom and covered with the previously stripped topsoil.
- Once the site is reclaimed any fences where they exist shall be removed to permit re-vegetation.

- Access and haul roads to the pit must be restored in a mutually agreeable manner where these are considered unnecessary after extraction has been completed.

The Rehabilitation would be carried out con-currently with the mining activity.

25.4. Closure objectives and their extent of alignment to the pre-mining environment.

The closure objectives are drawn from the rehabilitation plan hence they correlate. The objectives of the rehabilitation plan is to:

- Return the disturbed area to an acceptable post mining state.
- Ensure that all areas are stable and there is no risk of erosion,
- Prevent alien plant invasion on the site until the site is in a stable state, and
- Ensure that all areas are free draining and non-polluting.

The mining operations area is within unused space of land. The continuous rehabilitation program will attempt to restore the area to an acceptable standard that is as close to the baseline environmental state as possible. That will ensure safe use of the area for grazing purpose.

25.5. Calculation of the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

According to the Financial Provisions of 2015, section 6 an applicant must determine the financial provision through a detailed itemisation of all activities

and costs, calculated based on the actual costs of implementation of the measures required for-

(a) Annual rehabilitation, as reflected in an annual rehabilitation plan;

(b) Final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of the operations, as reflected in a final rehabilitation, decommissioning and mine closure plan; and

(c) Remediation of latent or residual environment impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

Rehabilitation cost for the mining activity would be R54 359.00. Refer to Table 18 below, for the quantum calculation for rehabilitation.

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

Should the Environmental Authorisation be granted, Stanley Masinga will make provision for the estimated costs by means a Bank guarantee, or any other means available and accepted by the competent authority.

The financial reserves provide for sufficient funds for premature and planned closure of the mining operation. The financial provision quantum for rehabilitation will be re-assessed on annual basis and arrangements to fund shortfalls will be made.

Table 16: Rehabilitation financial quantum calculation

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	13,7	1	1	0
2 (A)	Demolition of steel buildings and structures	m2	0	190,3	1	1	0
2(B)	Demolition of reinforced concrete buildings and structures	m2	0	280,46	1	1	0
3	Rehabilitation of access roads	m2	240,00	34,05	1	1	8172
4 (A)	Demolition and rehabilitation of electrified railway lines	m	0	330,5	1	1	0
4 (A)	Demolition and rehabilitation of non-electrified railway lines	m	0	180,3	1	1	0
5	Demolition of housing and/or administration facilities	m2	0	380,6	1	1	0
6	Opencast rehabilitation including final voids and ramps	ha	0,59	193716,3	1	1	114292,617
7	Sealing of shafts adits and inclines	m3	0	102,17	1	1	0
8 (A)	Rehabilitation of overburden and spoils	ha	0,037	133017,19	1	1	4921,63603
8 (B)	Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	ha	0	165670,5	1	1	0
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	481185,7	1	1	0
9	Rehabilitation of subsided areas	ha	0	111381,9	1	1	0
10	General surface rehabilitation	ha	0,094	105372,05	1	1	9904,9727
11	River diversions	ha	0	105372,05	1	1	0
12	Fencing	m	22	120,2	1	1	2644,4
13	Water management	ha	0	40065,4	1	1	0
14	2 to 3 years of maintenance and aftercare	ha	0	14022,9	1	1	0
15 (A)	Specialist study	Sum	0			1	0
15 (B)	Specialist study	Sum	0			1	0
					Sub Total 1		139935,6257

1	Preliminary and General	25332,83932	**weighting factor 2** 1	25332,83932
2	Contingencies	13993,56257		13993,56257
			Subtotal 2	179262,03
			VAT (15%)	26889,30
			Grand Total	**206151**

26. Mechanisms for monitoring compliance and the performance assessments against the EMPr.

Table 17: Mechanisms for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site establishment	Protection of archaeological features	Disturbance of historical artefacts monitoring	ECO Contractor	From start to finish
Excavation, crushing, screening, loading & Transportation	Dust generation	Nuisance and dust monitoring	ECO Contractor	From start to finish
	Noise disturbances	Noise nuisance	Resident engineer	From start to finish
	Ablution facilities & waste management	• Sewer waste disposal monitoring • General waste disposal monitoring • Hazardous waste disposal monitoring	ECO	From start to finish
	Hydrocarbon management	Spillage monitoring	ECO Contractor	From start to finish
	Protection of flora and fauna	Avoid and minimise vegetation disturbances.	ECO	From start to finish
	Erosion and drainage controls	Ensure that land erosion measures have been put in place.	ECO, contractor and engineer.	From commissioning to closure of quarries.
Rehabilitation	Closure of the quarry	Closure monitoring	ECO, Contractor and engineer.	From start to finish

26.1. Indicate the frequency of the submission of the performance assessment/ environmental audit report.

Annual Performance Assessment must be undertaken by the EAP. These reports must also include the assessment of the financial provision. The reports should be submitted to DMR.

27. Environmental awareness plan

An Environmental Awareness and Risk Assessment schedule will be developed and its purpose will be to ensure that all employees are trained and that the principles are continuously re-enforced.

Induction (including environmental awareness) training will be conducted on all people involved in the mining activities, prior to the commencement of any work; according to the relevant legislation, mining contractor Standard Operational Procedures (SOPs) and this EMP. The mining contractor will do in-house training, should it be necessary to its personnel on site. Other contractors will be required to provide training for their own employees.

Induction for all the staff and workers.

- An hour training will be provided on environmental awareness
- The objective will be :
    - ✓ To develop an understanding of what is meant by the natural environmental and social environment and establish a common language as it relates to environmental health safety and community aspects.
    - ✓ Establish a basic knowledge of the environmental legal framework and consequences of non-compliance.
    - ✓ Clarify the content and required actions for the implementation of the EMP.
    - ✓ Provide a detailed understanding of the definition, the method for identification and required response to emergency incidents.

- Monthly Awareness Talk

  Awareness talks for a period of 30 minutes shall be initiated, and incidents reinforce legal requirements, appropriate responses and measures for the adaptation of mitigation and/ management practices.
- Risk Assessments

  A daily task based risk assessment - the objective is to establish an understanding of the risks associated with a specific task and the required mitigation and management measures on a daily basis as part of daily tool box talks.

The following environmental awareness training will be provided to all staff and workers who will be involved in prospecting activities. Below is an overview of the applicable legislation and regulations as it relates to environmental, health and safety of the community and the protected area, which is inclusive of but are not limited to:

General Environmental Legal Principles and Requirements:

- Air quality management
- Water and wastewater management
- Hazardous substances
- Non-mining related waste management
- The appropriate remediation strategies & deteriorated water resources
- Biodiversity
- Weeds and invader plants
- Rehabilitation
- Contractors and tenants
- Energy and conservation
- Heritage resources
- General health and safety matters
- Basic conditions of employment
- Compensation for occupational injuries and diseases
- General mine health and safety matters

- Smoking in the workplace
- Noise & hearing conservation
- Handling, storage and use of hazardous substances
- Weapons and firearms

Content and implementation of the approved Environmental Management Programme:

- Allocated responsibilities and functions
- Management and mitigation measures
- Identification of risks and requirements adaptation
- Sensitive environments and features
- Description of environmentally sensitive areas and features
- Prohibitions as it relates to activities in or in proximity to such areas

Emergency situations and remediation

- Methodology for identifying areas where accidents and emergency situations may occur, communities and individuals that may be impacted.
- An overview of the response procedures
- Equipment and resources
- Designation of responsibilities
- Communication, including communication with potentially affected communities
- Training schedule to ensure an effective response.

Development of procedures and checklists

The following procedures will be developed and all staff and workers will be adequately trained on the content and implementation thereof.

Emergency preparedness and response

The procedure will be developed to specifically include risk identification, preparedness, response measures and reporting. The procedure will specifically include spill and fire risks, preparedness and response measures. The appropriate emergency control centres i.e. fire department, hospitals etc. will be identified and the contact numbers obtained and made available on site. The procedure will be developed in consultation with all potentially affected landowners.

General emergency procedure

In the event of all emergency situations the following should be done:

- The identified emergency controller and supervisor must be notified of an incident upon discovery.
- The accident area will be cordoned off to prevent unauthorised access and tampering of evidence.
- Actions defined within the emergency plan to limit/contain the impact of the emergency will be undertaken.
- The incident controller will take photographs and samples as necessary to assist in the investigation.
- The environmental control officer will ensure compliance with Section 30 of the National Environmental Management Act (107 of 1998) which states that:

  Depending on the nature of the emergency, the provincial regulatory authorities that have jurisdiction within the area should immediately be notified and this includes but is not limited to, the Director General (DWS and DEA, DMR and Inspectorate of Mines as appropriate), the South African Police Services, the relevant fire prevention service, the provincial head of READ, the head of the local municipality, the head of the regional DWS office and any persons whose health may be affected. Information to be reported includes:

- Nature of the incident.
- Any risks posed to public health, safety and property.
- Toxicity of the substances or by-products released by the incident.
- Steps taken to avoid or minimise the effects of the incident on public health and the environment.

- The environmental department must as soon as is practical after the incident:
  - Ensure that all reasonable measures are taken to contain and minimise the effects of the incident including its effects on the environment and any risks posed by the incident to the health, safety and property of the persons;
  - Ensure that the relevant clean up procedures were followed;
  - Ensure that the effects of the incident remedied through the implementation of corrective actions;
  - Ensure that preventative measures are developed and implemented;
  - Assess the immediate and long term effects of the incident (environment and public health); and
  - Within 14 days the environmental department must report to the Director-General, DWS and READ, the regional manager of the DMR, national environmental department manager, the head of the local and district municipality, the head of the regional DWS office such information as is available to enable an initial evaluation of the incident, including:
    - Nature of the incident
    - Substances involved and an estimation of the quantity released;
    - Possible acute effects of the substances on the persons and the environment (including the data needed to assess these effects);
    - Initial measures taken to minimise the impacts;

- Causes of the incident, whether direct or indirect, including equipment, technology, system or management failure; and
- Measures taken to avoid a recurrence of the incident.

Management of fire risks

- Each prospecting site will be cleared of vegetation
- "No smoking" signs must be prominently displayed.
- Fires will only be allowed within a facility especially constructed for the purpose of keeping warm and for cooking.
- No burning of refuse or vegetation is permitted
- Fire equipment must be easily accessible
- Fire equipment must be serviced, full and in good working order.

Management of spills

- Ensure that a proper spill-kit is available on site. The kit must include absorptive material that can handle all forms of hydrocarbon.
- Ensure that any hydrocarbon spills are cleaned up as soon as possible
- At least one person on site must receive formal training in the use of the spill control kit.
- Equipment is to be required immediately upon developing leaks.
- A drip tray, a thin concrete slab or a PVC lining shall be used to prevent soil and water contamination.
- All spills on site must be reported to the environmental officer
- Spread absorbent sand on areas where oil spills have occurred. Oil contaminated soils are to be removed to a contained storage area and disposed of appropriately.
- Non-degradable waste must be collected and disposed of at a registered waste site.

Falling into hazardous excavations

- Personnel discovering the fallen individual or animal must mobilise the emergency response team to the location of the incident and provide a general appraisal of the situation (e.g. Human or animal, conscious or unconscious, etc.)
- The injured party should be recovered by trained professionals such as qualified and well trained first aider. A doctor (or the appropriate medical practitioner)/ambulance should be present at the scene to provide first aid and transport individual to hospital.

Uncovering of graves and other historical artefacts

- If a grave or a historical artefact is discovered during operational activities, all activities should cease immediately and the Environmental Control Officer must be informed immediately.
- The ECO will immediately inform PHRA.
- PHRA will give guidelines on what to do with the discovered graves or artefacts.

Environmental and social audit checklist:

An environmental audit checklist will be established to include the environmental and social mitigation and management measures as developed and approved as part of the Environmental Management Plan. Non-conformances will be identified and corrective action taken where required.

All incidents will be investigated in collaboration with the environmental Control Officer. The focus of these investigations shall not be to apportion blame to specific employees, but to ascertain the root cause of the incident and to prevent a recurrence of similar incidents.

28. UNDERTAKING

The EAP herewith confirms

(a) The correctness of the information provided in the reports [X]

(b) The inclusion of comments and inputs from stakeholders and I&APs [X]

(c) The inclusion of inputs and recommendations from the specialist report where relevant. [ ]

(d) That the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. [X]

Signature of the Environmental Assessment Practitioner

Geopoint Africa (Pty) Ltd

Name of company

09 September 2019

Date