### DRAFT BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

Farm Name: Dorp Gronden Ladybrand 451/RE

**Magisterial District: Ladybrand** 



**July 2021** 

Compiled by: Environmental Management Group Physical Address: 41 Laan Sonder Naam, Groenvlei, Bloemfontein Postal Address: P.O Box 37473, Langenhovenpark 9330 Telephone: 051 412 6350 Contact person: Carika Nel Email:cnel@envmgp.com



# 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: Mantsopa Local Municipality

TEL NO: 051 924 0654

FAX NO: 051 924 0020

POSTAL ADDRESS: PO Box 64, LADYBRAND

PHYSICAL ADDRESS: 38 Joubert Street, LADYBRAND FILE REFERENCE NUMBER SAMRAD: To be assigned

FILE REFERENCE NUMBER SAMRAD: to be determined

- APPENDIX 1: EAPs CURRICULUM VITAE
- APPENDIX 2: LOCALITY MAP AND VEGETATION MAP
- APPENDIX 3: PUBLIC CONSULTATION DOCUMENTS
- APPENDIX 4: PROPOSED MAP AND ON SITE SURVEY REPORTS
- APPENDIX 5: IMPACTS AND RISKS ASSESSMENT REPORT
- APPENDIX 6: SPECIALISTS STUDIES
- APPENDIX 7: SENSITIVITY MAP
- APPENDIX 8: FINANCIAL PROVISIONS QUANTUM CALCULATION
- APPENDIX 9: REHABILITATION AND CLOSURE PLAN
- APPENDIX 10: ENVIRONMENTAL MONITORING PLAN
- APPENDIX 11: ENVIRONMENTAL AWARENESS PLAN
- APPENDIX 12: PROPERTY TITLE DEEDS DETAILS
- APPENDIX 13: LEGISLATIVE CONTEXT

### **ABBREVIATIONS USED IN THIS REPORT**

**DMR** : Department of Mineral Resources.

**DWS** : Department of Water and Sanitation.

**ECO** : Environmental Control Official.

**EIA** : Environmental Impact Assessment.

**EMPr** : Environmental Management Programme.

FS : Free State.

IAP : Interested and Affected Parties.

LOM : Life of Mine.

MPRDA : Minerals and Petroleum Resources Development Act.

**NEMA** : National Environmental Management Act.

SAHRA : South African Heritage Resources Agency.

SAPS : South African Police Services.

#### 1. IMPORTANT NOTICE

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

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

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

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

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

### 2. OBJECTIVE OF THE BASIC ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives,
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on 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; and
    - (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; and
  - (iii) identify residual risks that need to be managed and monitored.

### PART A SCOPE OF ASSSSMENT AND BASIC ASSESSMENT REPORT

### 3. Contact Person and correspondence address

### a) Details of

### i) Details of the EAP

Name of The Practitioner: CW Vermeulen

Tel No.: 051 412 6350

Fax No.: 082 824 9308

E-mail address: cwv@envmgp.com

### ii) Expertise of the EAP.

### (1) The qualifications of the EAP (with evidence).

CW Vermeulen holds a BSc. Degree in Environmental and Biological Sciences. The full CV of the EAP is attached in Appendix 1.

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

(In carrying out the Environmental Impact Assessment Procedure)

The EAP has over 7 years environmental assessment experience in projects covering waste management, mining permits or rights, road construction, infrastructure developments, agricindustrial developments, etc.

### b) Location of the overall Activity.

Farm Name:	Dorp Gronden Ladybrand 451/RE
Application area (Ha):	4.9ha
Magisterial district:	Ladybrand
Distance and direction from	11km Southeast of Ladybrand
nearest town	
21 digit Surveyor General	F0210000000045100000
Code for each farm portion	

### c) Locality map

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

The locality map is shown in Appendix 2.

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

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

The proposed site is situated 11 km South-East of Ladybrand. To access the borrow pit area the N8 road to Lesotho needs to followed where after a gravel roads exist directly to the site. Please refer to Appendix 4 which contains the site locality map.

The purpose of registering a borrow pit will be for the supply of construction materials for the surrounding area. Only mobile and temporary structures will be used during the operational period of the borrow pit which includes the office site and space for vehicle parking of  $\pm$  0, 5 ha. A 900 m fence will be erected around the borrow pit totalling a surface area of approximately 4, 4 ha. The site will impact an area of approximately 4, 5 ha.

Due to the nature of the material (weathered dolerite) only Excavators and TLBs will be used in the extraction process. Mining of dolerite will be executed as a shallow surface mining operation which makes "cuts" or a minable faces to mine before moving on to the next cut. No blasting will be required.

### (i) Listed and specified activities

(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etcetc  E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines,	Aerial extent of the Activity Ha or m <sup>2</sup>	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)
Surface mining to excavate material (dolerite).	4.9 ha	X	NEMA Listing Notice 1, Activity No. 21, GNR 327 of 7 April 2017
Clearing of vegetation for surface mining	4.9 ha	X	NEMA Listing Notice 1, No. 27 of 327 of 7 April 2017

#### (ii) Description of the activities to be undertaken

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

The Mantsopa Local Municipality requires building material to be used in construction projects for the upgrading of various infrastructure in the surrounding area. Therefore, a borrow pit/ gravel quarry is proposed in order to source the above mentioned construction material.

When mining activities start, existing gravels roads will be used to grant access to the borrow pit. Vegetation clearance will have to occur and for this site, specific areas will need to be avoided and certain plant species will first have to be removed. If topsoil and overburden needs to be removed before mining the materials, they will be stockpiled correctly and used again during the rehabilitation of the borrow pit. Mining will be done primarily by excavator (due to the soft nature of the material) and tipper trucks will remove mined gravel from the site.

Material excavated from the proposed borrow pit will be processed onsite in the following manner:

For the excavation of G5 to G7 material, an excavator will be utilised and all mining operation will be of a shallow surface open cast. An excavator will simply excavate the material and load the excavated material on to hauling trucks.

### e) Policy and Legislative Context

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT  (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process	REFERENCE WHERE APPLIED	HOW DOES THIS DEVELOPMENT COMPLIY WITH AND RESPOND TO THE LEGISLATION AND POLICY CONTEXT.  (E.g. In terms of the National Water Act a Water Use License has/ has not been applied for)
Mineral and Petroleum Resources Development	<b>Sections: 17, 38,</b>	Application submitted
Act, No. 28 of 2002 (as amended)	39, 41 and 106	for a mining permit.
National Environmental Management Act, No.	Section 24, 44	Environmental authorisation is
107 of 1998 as amended	and 47	required prior to the
		commencement of an activity
		that requires a mining permit.
		This is in the process of being
		done.

### f) Need and desirability of the proposed activities.

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

As the economy of South Africa grows the Mantsopa Local Municipality needs to develop their infrastructure to keep up with the growing population and need for job creation.

It is thus crucial to find and use suitable construction material for infrastructure. This material will be vital to the growth of the Mantsopa Local Municipality and will provide the opportunity for job creation and upgrading of existing infrastructure.

### g) Motivation for the overall preferred site, activities and technology alternative.

An in-depth exploration and site selection process was undertaken to identify suitable areas to register a borrow pit. This commodity is partially scares in the area but was difficult to find on municipal owned land.

It stands to reason that the proposed borrow pit that is located on municipal land is the only alternative. The mining activities will be basic with the following occurring on the proposed site:

- 1 Construction and upgrading of existing gravel roads to gain access to the borrow pit,
- 2 Clearance of vegetation and stockpiling of topsoil and overburden,
- 3 Step wise (cuts) excavation of the dolerite material through means of an excavator and,
- 4 Transportation of the excavated material through means of tipper trucks to the project locations.

As far as possible, modern mining techniques will be used to minimize operational costs and environmental impacts. Due to the simplified nature of mining in a borrow pit no other technology alternatives are recommended/ available.

### h) Full description of the process followed to reach the proposed preferred alternatives within the site.

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

Note that a detailed feasibility study was conducted with specific objectives and goals which aided in selecting an appropriate site for registering a borrow pit. This study is attached in Appendix 6.

### i) Details of the development footprint alternatives considered.

With reference to the site plan provided as **Appendix 2** and the location of the individual activities on site, provide details of the alternatives considered with respect to:

- (a) the property on which or location where it is proposed to undertake the activity;
- (b) the type of activity to be undertaken;
- (c) the design or layout of the activity;
- (d) the technology to be used in the activity;
- (e) the operational aspects of the activity; and
- (f) the option of not implementing the activity.
- a) The site is located on Dorp Gronden Ladybrand 451/RE, Ladybrand, Mantsopa Local Municipality, Free State Province.
- b) The activity that will be undertaken is mining and the method used will be basic shallow surface open cast mining.
- c) Areas that will be dedicated for the storage of topsoil and mined material stockpiles will be demarcated prior to the commencement of stripping. Due to the limited scope of the activities, only one layout is considered in this report.
- d) No technology alternatives are considered in the report.
- e) No operational alternatives are considered in the report.
- f) The No-go alternative implies that no material from the proposed area will be available.

### **Details of the Public Participation Process Followed**

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

The following measures were taken regarding the public participation process:

- Interested and affected parties (I&AP) were identified, and all relevant information sent to these parties.
- Notice boards were placed at the location where the borrow pit excavations will take place as well
  as a nearby local general store where the larger public will be able to take notice of the mining
  permit application.
- Newspaper advertisement will be placed in the Free State Kroon

The following Interested and Affected Parties were identified:

- Department of Water and Sanitation;
- Department of Agriculture,
- Ward Counsillor
- Department of Rural Development and Land Reform
- Mantsopa Local Municipality
- Thabo Mofutsanyana District Municipality
- Local District Executive manager of the local Municipality

The proof of public participation is shown in Appendix 3.

### i.

Summary of issues raised by I&APs (Complete the table summarising comments and issues raised, and reaction to those responses)

Interested and Affected Parties		Date	Issues raised	EAPs response to issues	as Section and paragraph
		Comments		mandated by the applicant	reference in this report
List the names of persons consu	Ited in	Received			where the issues and
this column, and					or response were
Mark with an X where those who	must				incorporated.
be consulted were in fact cons	ulted.				
AFFECTED PARTIES					
Landowner/s	Х				
Mantsopa Local Municipality	Х	N/A	No issues were raised	N/A	N/A
Lawful occupier/s of the land					
N/A	X	N/A	No issues were raised	N/A	N/A
Landowners or lawful occupiers on adjacent properties	Х	N/A	No issues were raised	N/A	N/A
N/A	Х	N/A	No issues were raised	N/A	N/A
Municipal councillor	X	N/A	No issues where raised	N/A	N/A
Municipality	Х	N/A	No issues were raised	N/A	N/A
Organs of state (Responsible for					
infrastructure that may be					
affected Roads Department,					
Eskom, Telkom, DWA e					
Department of Water and Sanitation	X	N/A	No issues were raised	N/A	N/A

Thabo Mofutsanyana District	Χ	N/A	No issues were raised	N/A	N/A
Municipality					
	Х	N/A	No issues were raised	N/A	N/A
Communities					
Dept. Land Affairs					
Department of Agriculture,	X	N/A	No issues were raised	N/A	N/A
Traditional Leaders					
None are applicable	X	N/A	No issues were raised	N/A	N/A
Dept. Environmental Affairs					
Department of Rural Development and					
Land Reform					
Other Competent Authorities					
affected					
OTHER AFFECTED PARTIES					
None					
INTERESTED PARTIES					
None					

ii. The Environmental attributes associated with the alternatives.(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

### (1) Baseline Environment

(a) Type of environment affected by the proposed activity.

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

The proposed site is situated 11 km South-East of Ladybrand. To access the borrow pit area the N8 road to Lesotho needs to followed where after a gravel roads exist directly to the site. Please refer to Appendix 4 which contains the site locality map.

The site is situated in the Eastern Free State Sandy Grassland type (Gm4) (SANBI, 2018) (Figure 2). The Sandy Grassland is an endangered vegetation type that is very poorly conserved. Only 2% of the targeted 24% is formally conserved (Mucina and Rutherford, 2006). The Free State Biodiversity Map indicated that the site and its surroundings are degraded (Collins, 2015) (Figure 8). This statement was opposed because the area presented various habitats (outcrop plant communities, mountain catchment drains, grassland, and tall shrublands associated with Gm5), relatively low levels of anthropogenic disturbance, numerous protected floras, and is placed within an endangered vegetation type. It was concluded that the site deserves a higher conservation consideration. Therefore, the report regards the area as having a moderate conservation priority.

The study area covers 5.5 ha of uneven, rocky terrain situated at the northern edge of the Platberg, which is an extensive table-topped summit located immediately south of the Ladybrand CBD. The footprint is located within the outcrop area of the Late Triassic - Early Jurassic Elliot Formation of the Stormberg Group (uppermost Karoo Supergroup). The Elliot Formation represents the penultimate phase of Karoo sedimentation and is characterized by its fluvially derived red bed deposits that respectively overlies and underlies the Molteno and Clarens Formations. The site is located on sloping terrain that is partially intruded by a small, localized dolerite flow. Palaeontologically, the the proposed borrow pit site is located in a potential outcrop area of the Euskelosaurus and Massospondylus Range Zones. It is important to note that fossils are rarely uniformly distributed within the fine- to medium-grained sandstone beds and subordinate mudstones of the Elliot and conformably overlying Clarens Formation. Even if operational activities are restricted to the proposed dolerite outcrop it remains highly likely that vertebrate fossil remains (or ichnofossils such as dinosaur footprints) might be affected or destroyed during the course of removing dolerite material at the site. Platberg is a prominent feature of the local geological landscape. The Heritage report does not recommend any development both in terms of the Heritage- and fossil importance.

The proposed borrow pit site lies within the Mantsopa Local Municipality, in the Thabo Mofutsanyane District Municipality. According to Stats SA the total population of Mantsopa municipality is 53 036 people, of which 47311 are black African, 1760 are coloured, 4010 are white people and with the other population groups making up the remaining 444 people. The main age group is between 15 and 34 years of age. Only 2,6% of people completed Matric, whereas 4,8% have a higher education. The dependency

ratio in the area is 59.8 (This indicates a high pressure on a low active population). 36, 9% have a good quality of water service provided inside a dwelling or yard and 82,5% of people obtain water outside their yard. Electricity is provided for 80,4% of the population.

(b) Description of the current land uses.

The surrounding land is utilised by subsistence farmers as grazing for livestock.

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

There is no infrastructure near proposed borrow pit site. The proposed site is overgrazed by livestock.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Refer to Appendix 4 to observe the current land use and the environment.

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

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

Refer to Appendix 5.3 which includes a full risk impact assessment

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

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

Refer to Appendix 5.2 for the methods used to determine the environmental impact.

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

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

The site layout of the proposed borrow pit is simple and uncomplicated from a mining perspective since it will only be utilised as a source of construction material. In terms of site layout and its alternatives, no significant changes will be noticed as the site is only a small 5ha

area. As such the positive and negative impacts relating to the layout of the borrow pit are insignificant, impacting neither in a positive nor negative manner.

The heritage report notes that although the dolerite that will be mined has no cultural or paleontological value the sandstone surrounding it has a high chance of containing fossils and was noted by the specialist that the chance of finding/destroying these finds during mining activities are high.

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

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

Refer to Appendix 5.4 for the mitigation measures.

vii. Motivation why no alternative sites were considered.

As previously mentioned, the Mantsopa Local Municipality together with the Feasibility Study (Appendix 6) had objectives which included that dolerite must be used as construction material and it had to be on municipal owned land. Due to the partially scares resource in the area any dolerite areas found on municipal land were selected. Due to transportation constraints (distance form towns), only the area being applied for is feasible.

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

Since the dolerite dictates in which direction mining occurs and the fact that the 5 ha area is considered very small for mining purposes no other site layout alternatives have been considered.

i) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity. (Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

Only one layout was considered. Information about the process is contained in Appendix 5.

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

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etcetc  E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etcetc.)	(lncluding the potential impacts for cumulative impacts)  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etcetc)		In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)		(modify, remedy, control, or stop) through (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation	<b>3</b>
Site establishment activities (fencing, signage, access	Loss of vegetation	Visual character, Land Use	Pre-mining	High	Remedy through rehabilitation, Limit footprint	Low
formation, etc.)	Habitat destruction	Visual character	Pre-mining	Medium	Remedy through rehabilitation, Limit footprint	Low
	Visual scarring	Visual character	Pre-mining	Medium	Remedy through rehabilitation	Low
	Soil erosion	Visual character, Land use	Pre-mining	Medium	Remedy through rehabilitation, Limit footprint, Control through storm water control	Low
Clearance of area for mining	Visual scarring	Visual character	Operational Phase	Medium	Remedy through rehabilitation	Low
	Destruction of flora and habitat	Visual character, Land use	Operational Phase	High	Remedy through rehabilitation, Limit footprint and removal of vegetation	Low
	Loss of agricultural potential	Land use management	Operational Phase	Low	Control through soil conservation techniques	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
					Limit footprint of the borrow pit as far possible to limit loss of agricultural land	
	Soil erosion	Land use management	Operational	Medium	Control through soil conservation techniques, Stop through appropriate storage of topsoil	Low
Excavation	Dust emissions	Air quality	Operational Phase	Medium	Use of dust control measures	Low
	Drainage disruption	Drainage	Operational Phase	Medium	Control through storm water controls	Low
	Slope instability	Topography	Operational Phase	Low	Control through slope management controls	Low
	Noise	Noise	Operational Phase	Low	Control through noise control measures	Low
	Visual scarring	Visual character	Operational Phase	Medium	Remedy through rehabilitation of already worked areas	Low
	Soil erosion	Land use	Operational Phase	Low	Remedy through the rehabilitation of already worked areas, Control through slope control, Stop through appropriate storage of topsoil	Low
	Destruction of heritage resource	Heritage issues	Operational Phase	High	Avoidance	High
Drilling & blasting (if done)	Noise and vibrations	Noise	Operational Phase	Medium	Use of blast control measures	Low
	Dust	Air quality	Operational Phase	Low	Use of dust control measures	Low
	Fly rock	Safety and land degradation	Operational Phase	Low	Use blast of control measures and site management protocols	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	SIGNIFICANCE if not mitigated	MITIGATION TYPE	SIGNIFICANCE if mitigated
Waste Disposal and Material storage	Soil contamination	Land degradation	Operational Phase	Low	Avoidance	Low
	Water pollution	Water	Operational Phase	Low	Avoidance	Low
	Increased risk of fire	Safety	Operational Phase	Low	Avoidance	Low
Material handling, hauling and transportation	Dust	Air quality	Operational Phase	Low	Use of dust control measures	Low
	Increased risk of accidents	Safety	Operational Phase	Low	Use of site management protocols	Low
	Noise	Noise	Operational Phase	Low	Control through noise control measures	Low
	Soil contamination from oil/fuel leaks	Land degradation	Operational Phase	Low	Stop through operational control measures.	Low
Removal of infrastructure & equipment and re- shaping of	Noise	Noise	Decommissioning and closure	Low	Use of noise control measures	Low
borrow pit	Dust	Air quality	Decommissioning and closure	Low	Use of dust control measures	Low
	Soil contamination from oil/fuel	Land degradation	Decommissioning and closure	Low	Stop through operational control measures	Low
	Disruption of surface drainage	Water movement	Decommissioning and closure	Low	Remedy with storm water controls, remedy through rehabilitation	Low
Community and labour relations management	Community conflicts and tensions	Community relations	Operational Phase	Low	Control with site management protocols	Low
	Increased risk of fire	Fire risk	Operational Phase	Low	Control with site management protocols	Low
	Reduced security on area	Safety issues	Operational Phase	Low	Control with site management protocols	Low

NAME OF ACTIVITY	POTENTIAL IMPACT	ASPECTS	PHASE	SIGNIFICANCE	MITIGATION TYPE	SIGNIFICANCE
		AFFECTED		if not mitigated		if mitigated
	Improved employment	Community	Operational	Low	Control with site management	Low
		relations	Phase		protocols	
	Improved skills	Community	Operational	Low	Control with site management	Low
		relations	Phase		protocols	

The supporting impact assessment conducted by the EAP is attached in Appendix 5.

### k) Summary of specialist reports.

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

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
Ecological Assessment	Impact on ecological elements within the study area is considered likely due to the presence of endangered/protected species.	X	
Heritage Impact Assessment	It is recommended that the bedrock palaeontological component at the site is assigned a site rating of Local Significance 3A. Proposed development at the site is not advised. No aboveground signs of graves or graveyards were observed within the proposed footprint area. Historical buildings or structures older than 60 years are absent from the site. Impact on potential in situ archaeological material, prehistoric structures, historical structures, rock engravings or graves in the affected area is considered unlikely. However, in addition to the well-documented history of the Platberg region, the study area is located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located only about 300 m away on the	X	

northern slopes of Platberg. Although there are no tangible evidence of	
archaeological remains within the confines of the proposed study area, the	
Platberg is irreplaceable in terms of cultural landscape. It is recommended	
that the archaeological component of the footprint is assigned a site rating	
of Local Significance 3A. Proposed development at the site is not advised.	

### I) Environmental impact statement

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

The findings of the studies undertaken within this EIA to assess both the benefits and potential negative impacts anticipated from the proposed project conclude that:

- There are environmental fatal flaws that should prevent the proposed borrow pit development. The study area is located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located only about 300 m away on the northern slopes of Platberg. Provided that the recommended mitigation and management measures are implemented, and given due consideration during the life of mine of the borrow pit.
- The development will have both positive and negative social impacts. It will create
  employment for locals during operational and closure and rehabilitation. The negative
  impacts are very low and restricted to loss of grazing.
- The management of the impacts hinge on the effective and efficient operation of the borrow pit. There is a need to ensure that competent personnel are employed and adequate training and skills development are provided for where it is lacking.
- The cumulative significance of all the negative potential impacts on the environment is considered low due to the limited scale of the development and the scarcity of development in the immediate surrounding area.

### (ii) Final Site Map

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

Map information is attached as Appendix 7.

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

No alternatives were considered. The major negative impacts associated with the proposed borrow pit is the deterioration of environmental parameters such as loss of vegetation and archaeological remains. These impacts however have no- to low impacts on the small 5 ha scale that is being applied for and if rehabilitation is applied correctly the risks will be considered insignificant.

For the proposed borrow pit the negative impacts far outweigh the small environmental impacts from operating a borrow pit. Authorizing the borrow pit will stimulate the construction sector for the surrounding community which leads to temporary/ permanent job creation. This in turn increases living standards and infrastructure for the area.

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

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

The management objectives and impact management outcomes are:

- To fulfil the requirements of Mineral and Petroleum Resources Development Act, the requirements of the National Environmental Management Act and other legislative requirements.
- To promote the rational development of the borrow pit in order to reduce or eliminate the associated negative environmental impacts.
- To identify proposed mitigation and management measures to manage adverse impacts and to increase benefits.
- To ensure that the applicant use resources efficiently and effectively during the life of mine in order to reduce wastage thereby reducing associated negative environmental impacts.
- To improve the environmental awareness of all personnel who will work at the borrow pit.

### n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

The applicant should provide environmental training for all employees working at the borrow pit during life of mine.

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

(Which relate to the assessment and mitigation measures proposed)

In undertaking this investigation and compiling the report, it has been assumed that:

- The information provided by the client, the applicant and specialists is accurate and unbiased.
- The scope of this investigation is limited to assessing the environmental impacts associated with the proposed mine area and does not include assessment of lifecycle analysis of equipment and other materials to be used at the mine.

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

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

There are environmental fatal flaws that should prevent the proposed development of the proposed mine on the current location provided. The study area is located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located only about 300 m away on the northern slopes of Platberg. Proposed development at the site is not advised.

The cumulative significance of all the negative potential impacts on the environment is considered low due to the limited scale of the development and the scarcity of development in the immediate surrounding area.

### ii) Conditions that must be included in the authorisation

- The borrow pit will be rehabilitated properly after material has been sourced and the Municipality should give their input in the finishing off and rehabilitation of the mine (Rehabilitation Plan).
- The mine must be managed in accordance with the Environmental Management Program /plan
- The finishing off of the mine must be safe for humans and animals

- People residing in the area should be informed of who will be working on the mine.
- There should be no dumping of any kind of waste at or in the mine.
- Environmental awareness training should be given to all employees working at the mine (especially on endangered/protected species)
- The applicant should provide environmental training for all employees working at the mine during life of mine.
- No site of archaeological or historical significance may be moved without a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered heritage specialist.

### q) Period for which the Environmental Authorisation is required.

3 years for a mining permit.

### r) Undertaking

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

The undertaking is provided at the end of the Report.

#### s) Financial Provision

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

The Department of Mineral and Petroleum Resources was contacted before the submission of this BAR. DMR confirmed that since the Mantsopa Local Municipality is the applicant no financial provision report will be required. Rehabilitation will then be the sole responsibility of the contractor that is utilizing the borrow pit.

- t) Specific Information required by the competent Authority
  - i) Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998). the EIA report must include the:-
    - (1) Impact on the socio-economic conditions of any directly affected person. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as an Appendix

The mining activities will have no direct impact on the social-economic conditions. The landowner is the Mantsopa Local Municipality which is using the land for informal subsistence farming. The material will be used to improve the road conditions and safety that will have a positive impact on the social-economic conditions within the surrounding community.

(2) Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act. (Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix 2.19.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Proposed development at the site is not advised. No aboveground signs of graves or graveyards were observed within the proposed footprint area. Historical buildings or structures older than 60 years are absent from the site. Impact on potential in situ archaeological material, prehistoric structures, historical structures, rock engravings or graves in the affected area is considered unlikely. However, in addition to the well-documented history of the Platberg region, the study area is located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located only about 300 m away on the northern slopes of Platberg. Although there are no tangible evidence of archaeological remains within the confines of the proposed study area, the Platberg is irreplaceable in terms of cultural landscape. It is recommended that the archaeological component of the footprint is assigned a site rating of Local Significance 3A. Proposed development at the site is not advised. No site of archaeological or historical significance may be moved without a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered heritage specialist.

### u) Other matters required in terms of sections 24(4)(a) and (b) of the Act. (the EAP managing the application must provide the competent authority with detailed, written proof of an investigation

(the EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4**).

As the nature and scale of the borrow pit operation is limited to 5ha, no reasonable feasible alternative was therefore considered. Whilst no feasible alternatives are assessed, the assessment of the No Go alternative, i.e. not implementing the borrow pit development was done.

#### **PART B**

#### ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

- 1) Draft environmental management programme.
  - a) **Details of the EAP**, (Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

The details of the EAP are provided in Part A.

b) **Description of the Aspects of the Activity** (Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

The details are covered in Part A as required.

### c) Composite Map

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

The map is included in Appendix 7.

- d) Description of Impact management objectives including management statements
  - i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described)

The closure management objectives took into account the existing environment, possible environmental impacts and the expectations at closure. To ensure that the closure objectives are informed by the type of environment, the anticipated impacts and damage at closure, the sensitivity of the area and expected post closure land use were taken into account. In doing so, principles of integrated environmental management were taken into account together with the principles of sustainable development. The closure objectives are:

- To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.
- To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.
- To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the borrow pit operations cease.
- To establish a stable post-mining land surface which has been rehabilitated that also supports vegetation growth, is erosion resistant and has long term sustainability.
- To reduce the need for long-term monitoring and maintenance by establishing effective stability
  of the disturbed areas.

ii) Volumes and rate of water use required for the operation.

No water will be used for actual borrow pit operations; however, water will be available for the personnel working at the borrow pit and distributed via a water truck.

iii) Has a water use licence has been applied for?

In terms of actual water usage on site, no water license will be required

## iV) Impacts to be mitigated in their respective phasesMeasures to rehabilitate the environment affected by the undertaking of any listed activity

		SCALE	MITIGATION MEASURES		TIME PERIOD FOR IMPLEMENTATION
(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etcetcetc  E.g. For mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etcetc)	(of operation in which activity will take place.  State; Planning and design.	disturbance	(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Site establishment activities (fencing, signage, access formation, etc.)	Start-up	± 0.5ha		Issues of compliance with standards will be incorporated into the day to day activities at the quarry. The work methods used the monitoring and measures done and the review processes will be aimed at ensuring that legal thresholds as set out in the environmental standards are complied with. This will include compliance with Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and National Water Act regulations.	During start-up and operational phase.
Clearance of vegetation for mining	Start-up & Operational phase	± 4.9 ha		measurements done and the review processes	During start-up and operational phase as necessary.

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES		TIME PERIOD FOR IMPLEMENTATION
				Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and Conservation of Agricultural Resources Act.	
Excavation of material	Operational	± 4.9 ha	See Appendix 5	Management of legal compliance will be incorporated into normal business activities. This means that particular responsibilities need to be clearly defined for the identification of relevant issues and delivery of compliance. This will help to ensure that adequate resources are available to support these activities. Environmental standards as set out in Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, South African Heritage Resources Act and National Water Act regulations.	Operational phase.
Drilling & blasting (if done)	Operational	As needed	See Appendix 5	All recommendations and mitigation measures will ensure little to no permanent impact on the environment this will ensure effective rehabilitation and restoration.	Operational phase (when necessary)
Waste disposal and material storage	Operational	Undetermined	See Appendix 5	The waste management hierarchy and the proximity principle will be used in ensuring that the environmental standards as set out in National Environmental Management Waste Act regulations and National Water Act regulations, are complied with.	Operational phase.
Material handling, hauling and transportation	Operational	Undetermined	See Appendix 5	Issues of compliance with standards will be incorporated into the day to day business activities at the quarry to ensure that legal thresholds as set out in the environmental standards are complied with. This will include	Operational phase.

ACTIVITIES	PHASE	SIZE AND SCALE	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
				compliance with standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations and Mine Health and Safety Act regulations.	
Removal of infrastructure & equipment	Decommissioning and closure	Affected areas	See Appendix 5	The recommendations will incorporate factors that include the elimination or the minimization of negative impacts in the work methodologies used during decommissioning so as to comply with the standards as per Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and National Environmental Management Act.	At decommissioning.
Re-shaping of quarry	Decommissioning and closure	±4.9ha	See Appendix 5	Considerations with the elimination or at least the minimization of any future impacts from the quarry and the long term stability of the facility. Also, any concerns in relation to the long term liability for the proposed quarry/mine and its aesthetics will be incorporated in order to ensure compliance with standards as set out in the Mine Health and Safety Act regulations, National Environmental Management Act and National Water Act regulations.	Closure period.
Community and labour relations management	Operational	N/A	See Appendix 5	Will comply with Basic Conditions of Employment Act regulations, Employment equity Act, Labour Relations Act and Skills Development Act.	During operational phase.
Re-vegetation of disturbed areas	Closure	± 4.99ha	See Appendix 5	The future impacts from the quarry and the long term stability of the area, any concerns in relation to the long term liability for the facility	During operational phase in sections where mining has been completed and during

ACTIVITIES	_	SIZE AND SCALE	MITIGATION MEASURES		TIME PERIOD FOR IMPLEMENTATION
				and its aesthetics will be taken into account to ensure compliance with the National Environmental Management Act, Conservation of Agricultural Resources Act and National Environmental Management Biodiversity Act regulations.	closure.

Details of mitigation measures are provided for in Appendix 5.

e) Impact Management Outcomes
(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

ACTIVITY (whether listed or not listed).  (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etcetc.).	POTENTIAL IMPACT  (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etcetc)	ASPECTS AFFECTED	PHASE In which impact is anticipated  (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE  (modify, remedy, control, or stop) through (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g.  • Modify through alternative method.  • Control through noise control  • Control through management and monitoring  • Remedy through rehabilitation.	STANDARD TO BE ACHIEVED  (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Site establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation	Visual character, Land use	Start-up	Removal of endangered/protected species. Remedy through rehabilitation Limit footprint	Impact managed effectively
·	Habitat destruction	Visual character, land use	Start-up	Remedy through rehabilitation Limit footprint	Impact reduced
	Visual scarring	Visual character	Start-up and Operational Phase	Remedy through rehabilitation	Impact managed effectively
	Soil erosion	Visual character, land use	Star-up and Operational Phase	Remedy through rehabilitation, storm water control. Limit footprint, Control through storm water control	Impact avoided
Clearance of area for mining	Visual scarring	Visual character	Operational Phase	Remedy through rehabilitation Limit footprint and removal of vegetation.	Impact managed to acceptable levels, residual impact reduced
	Destruction of flora and habitat	Visual character, land sue	Operational Phase	Remedy through rehabilitation	Impact reduced to satisfactory levels
	Loss of agricultural	Land use management	Operational Phase	Use soil conservation techniques	Impact managed to suitable soil

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	potential			Limit Foot print	fertility levels
	Soil erosion	Visual character, land	Start-up and	Remedy through rehabilitation,	Impact avoided
		use	operational	Storm water control	
Excavation	Dust emissions	Air quality	Operational Phase	Control with dust control	Particulates reduced to acceptable
				measures	levels
	Drainage disruption	Drainage	Operational Phase	Control with Storm water	Good surface water run-off
				controls	established
	Slope instability	Topography	Operational Phase	Control with slope management	Stable surfaces established
				controls	
	Noise	Noise	Operational Phase	Control with Noise control	Noise reduced to acceptable
				measures	levels
	Visual scarring	Visual character	Operational Phase	Rehabilitation	Impact managed effectively,
					residual impact reduced
	Soil erosion	Land use	Operational Phase	Rehabilitation, use slope	Impact levels avoided
				management control	
	Destruction of	Heritage issues	Operational Phase	Avoidance	Impact avoided
	heritage resource				
Drilling & blasting (if	Noise and vibrations	Noise	Operational Phase	Control with blast control	Noise levels reduced to
done)				measures	acceptable levels
	Dust	Air quality	Operational Phase	Control with dust control	Particulates reduced to acceptable
				measures	levels
				Control with blast control	
				measures	
	Fly rock	Safety and land	Operational Phase	Control with blast control	Fly rock avoided
		degradation		measures	
Waste Disposal and	Soil contamination	Land degradation	Operational Phase	Avoidance, operational control	Impact avoided
Material storage				measures	
	Water pollution	Water	Operational Phase	Avoidance, operational control	Impact avoided
				measures	
	Increased risk of fire	Safety	Operational Phase	Avoidance, operational control	Impact avoided or managed to low
				measures	levels

ACTIVITY	POTENTIAL IMPACT	ASPECTS AFFECTED	PHASE	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Material handling,	Dust	Air quality	Operational Phase	Control with dust control	Particulates reduced to acceptable
hauling and				measures	levels
transportation	Increased risk of	Safety	Operational Phase	Use site management protocols	Accidents avoided or reduced to
	accidents				low levels
	Noise	Noise	Operational Phase	Control with noise control	Noise reduced to acceptable
				measures	levels
	Soil contamination	Land degradation	Operational Phase	Operational control measures	Impact managed to suitable soil
	from oil/fuel leaks				fertility levels
Removal of	Noise	Noise	Decommissioning	Control with noise control	Noise levels reduced to
infrastructure &			and Closure	measures	acceptable levels
equipment and re-	Dust	Air quality	Decommissioning	Control with dust control	Particulates reduced to acceptable
shaping of Quarry			and Closure	measures	levels
	Soil contamination	Land degradation, water	Decommissioning	Avoidance, Control with	Impact managed to suitable soil
	from oil/fuel	pollution	and Closure	operational control measures	fertility levels
	Disruption of surface	Water movement	Decommissioning	Control with storm water controls	Free drainage achieved
	drainage		and Closure		
Community and labour	Community conflicts	Community relations	Operational Phase	Control using site management	Reduction in complaints and
relations management	and tensions			protocols	incidences of conflict
	Increased risk of fire	Fire risk	Operational Phase	Control using Site management	Fires avoided and risk reduced
				protocols	
	Reduced security on	Safety issues	Operational Phase	Control site management	Improvement in security and
	area			protocols	elimination of theft incidences
	Improved employment	Community relations	Operational Phase	Control site management	Increase in number of people
				protocols	employed
	Improved skills	Community relations	Operational Phase	Controls site management	Improvement in skills level
				protocols	

f) Impact Management Actions

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

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
whether listed or not listed.  (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etcetc)	(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etcetc)	(modify, remedy, control, or stop) through (e.g. noise control measures, storm- water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc)  E.g.  • Modify through alternative method. • Control through noise control • Control through management and monitoring Remedy through rehabilitation	Describe the time period when the measures in the environmental management program must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. With regards to Rehabilitation, therefore state either: Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	(A description of how each of the recommendations in 2.11.6 read with 2.12 and 2.15.2 herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)
Site establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation	Removal of endangered/protected species. Remedy through rehabilitation Limit footprint	Start-up	Issues of compliance with standards will be incorporated into the day to day activities at the mine. The work methods used, the monitoring and measures done, and the review processes will be
	Habitat destruction	Remedy through rehabilitation Limit footprint	Start-up	aimed at ensuring that legal thresholds, as set out in the environmental standards, are complied with.
	Visual scarring	Remedy through rehabilitation	Start-up and Operational Phase	This will include compliance with Mining and Petroleum Resources Development Act regulations,
	Soil erosion	Remedy through rehabilitation, storm water control. Limit footprint, Control through storm water control	Start-up and Operational Phase	Mine Health and Safety Act regulations and National Water Act regulations.
Clearance of area for mining	Visual scarring	Remedy through rehabilitation Limit footprint and removal of vegetation.	Operational Phase	The work methods used, the monitoring and measurements done and the review processes will be aimed at ensuring that legal thresholds, as set
	Destruction of flora and habitat	Remedy through rehabilitation	Operational Phase	out in the environmental standards, are complied with. This will include compliance with Mining and
	Loss of agricultural	Use soil conservation techniques	Operational Phase	Petroleum Resources Development Act regulations,

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD IMPLEMENTATION	FOR	COMPLIANCE WITH STANDARDS
	potential	Limit foot print as far as possible			Mine Health and Safety Act regulations and
	Soil erosion	Remedy through rehabilitation, Storm water control	Operational Phase		Conservation of Agricultural Resources Act.
Excavation	Dust emissions	Control with dust control measures	Operational Phase		Management of legal compliance will be
	Drainage disruption	Control with Storm water controls	Operational Phase		incorporated into normal business activities. This
	Slope instability	Control with slope management controls	Operational Phase		means that particular responsibilities need to be clearly defined for the identification of relevant
	Noise	Control with Noise control measures	Operational Phase		issues and delivery of compliance. This will help to ensure that adequate resources are available to
	Visual scarring	Rehabilitation	Operational Phase		support these activities. Environmental standards
	Soil erosion	Rehabilitation, use slope management control, storm water control	Operational Phase		as set out in Mining, Petroleum Resources Development Act regulations, South African Heritage Resources Act, Mine Health and Safety
	Destruction of heritage resource	Avoidance	Operational Phase		Act regulations.
Drilling & blasting (if done)	Noise and vibrations	Control with blast control measures	Operational Phase		This will be achieved by clearly outlining the environmental standards to be achieved and the
	Dust	Control with dust control measures Control with blast control measures	Operational Phase		thresholds which are not to be exceeded in the management system used at the site. This will include compliance with standards as per,
	Fly rock	Control with blast control measures, operational control.	Operational Phase		Explosive Act regulations, Mine Health and Safety Act regulations and the Hazardous Substances Act.
Waste disposal and material storage	Soil contamination	Avoidance, Operational control measures	Operational Phase		The waste management hierarchy and the proximity principle will be used in ensuring that the
	Water pollution	Avoidance, Operational control measures	Operational Phase		environmental standards as set out in National Environmental Management Waste Act regulations
	Increased risk of fire	Avoidance, Operational control measures	Operational Phase		and National Water Act regulations are complied with.
Material handling,	Dust	Control with dust Control measures	Operational Phase		Issues of compliance with standards will be
hauling and	Increased risk of	Site management protocols	Operational Phase		incorporated into the day to day activities at the

ACTIVITY	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
transportation	accidents			mine to ensure that legal thresholds as set out in
	Noise	Control with noise control measures	Operational Phase	the environmental standards are complied with. This will include compliance with Mining and
	Soil contamination from oil/fuel leaks	Control with operational control measures	Operational Phase	Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations, National Water Act regulations and Mine Health and Safety Act regulations.
Removal of infrastructure & equipment and shaping	Noise	Control with noise control measures	Decommissioning and Closure	The recommendations will incorporate factors that include the elimination or the minimization of
of quarry	Dust	Control with dust control measures	Decommissioning and Closure	negative impacts in the work methodologies used during decommissioning so as to comply with the Mining and Petroleum Resources Development Act regulations, Mine Health and Safety Act regulations and National Environmental Management Act.
	Soil contamination from oil/fuel	Control with operational control measures	Decommissioning and Closure	
	Disruption of surface drainage	Control with storm water controls	Decommissioning and Closure	
Community and labour relations management	Community conflicts and tensions	Control using site management protocols	Operational Phase	The future impacts from the mine and the long term stability of the area, any concerns in relation to the
	Increased risk of fire	Control using site management protocols	Operational Phase	long term liability for the facility and its aesthetics will be taken into account to ensure compliance
	Reduced security in area	Control site management protocols	Operational Phase	with the National Environmental Management Act,
	Improved employment	Control site management protocols	Operational Phase	Conservation of Agricultural Resources Act and
	Improved skills	Use of site management protocols	Operational Phase	National Environmental Management Biodiversity Act regulations.

#### i) Financial Provision

- (1) Determination of the amount of Financial Provision.
  - (a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.

Note that the Mantsopa local municipality is the applicant but will not be required to submit a financial provision report. The responsibility of rehabilitation will be the sole responsibility of the contractor using the borrow pit. Whilst steps are taken throughout the project life cycle to reduce negative environmental impacts as they occur, the specific closure objectives are as follows:

- To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.
- To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.
- To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the mine operations cease.
- To establish a stable post-mining land surface which has been rehabilitated that also supports vegetation growth, is erosion resistant and has long term sustainability.
- To rehabilitate the disturbed areas to an end land use similar to that prior to commencement of any mining activities as far possible, in this case an end land use of at least grazing.
- To reduce the need for long-term monitoring and maintenance by establishing effective stability of the disturbed areas.
- (b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

Objectives have been set out in regard to closing of the borrow pit. Consultation between the EAP, landowner and I&AP has taken place.

(c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The rehabilitation plan is shown in Appendix 9.

(d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The rehabilitation takes into consideration the nature of the impacted land at the end of operational activities and objectives at closure and the need to ensure that the post closure maintenance is minimal.

(e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

A financial provision report will not be applicable to the Mantsopa Local Municipality which is the applicant. The contractor which utilizes the borrow pit will be responsible for the total cost of rehabilitation as set out according to the EMPr and Rehabilitation Plan.

(f) Confirm that the financial provision will be provided as determined.

The applicant, Mantsopa Local Municipality, will be responsible to ensure rehabilitation is done by the contractor.

## Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including g) Monitoring of Impact Management Actions h) Monitoring and reporting frequency

- Responsible persons
- j) Time period for implementing impact management actions k) Mechanism for monitoring compliance

SOURCE ACTIVITY	IMPACTS REQUIRING	FUNCTIONAL REQUIREMENTS FOR	ROLES AND RESPONSIBILITIES	MONITORING AND REPORTING
	MONITORING PROGRAMMES	MONITORING	(FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site establishment activities (fencing, signage, access formation, etc.)	Loss of vegetation, Habitat destruction, Visual scarring, Soil erosion	Visual checks, monitoring incidences of non-compliance, recording of key parameters  See Appendix 10 for details	Appointed Contractor	At start and as and when required. Record incidences of non-compliance monthly.  See Appendix 9 for details
Clearance of area for mining	Visual scarring, Destruction of flora and habitat, Loss of agricultural potential	Visual checks, monitoring incidences of non-compliance, recording of key parameters  See Appendix 10 for details	Appointed Contractor	At start and as and when required. Record incidences of non- conformances as they occur and do monthly report. See Appendix 9 for details
Excavation	Dust emissions, Drainage disruption, Slope instability, Visual Scarring, Soil erosion, Destruction of heritage resources	Visual checks, monitoring incidences of non-compliance, recording of key parameters  See Appendix 10 for details	Appointed Contractor	No site of archaeological or historical significance may be moved without a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered heritage specialist During operational phase. Record measurements monthly and incidences of non-compliance.  See Appendix 9 for details
Drilling & blasting (if	Noise and vibrations,	Visual checks, monitoring incidences	Appointed Contractor	When drilling and/or blasting is done.

done)	Dust, Fly rock	of non-compliance, recording of key		Record key parameters when done.
		parameters		
				See Appendix 9 for details
		See Appendix 10 for details		
Waste disposal and	Soil contamination,	Visual checks, monitoring incidences	Appointed Contractor	During life of mine as and when
material storage	Water pollution,	of non-compliance, recording of key		required. Record key parameters
	Increased risk of fire	parameters		monthly and non-compliances.
		See Appendix 9 for details		See Appendix 9 for details
Material handling,	Dust, Increased risk of	Visual checks, monitoring incidences	Appointed Contractor	Ongoing during life of mine and record
hauling and	accidents, Noise,	of non-compliance, recording of key		key parameters monthly & non
transportation	Soil contamination	parameters		compliances.
		See Appendix 10 for details		See Appendix 9 for details
Removal of	Noise, Dust, Soil	Visual checks, monitoring incidences	Appointed Contractor	At decommissioning and closure and
infrastructure &	contamination,	of non-compliance, recording of key		when required. Maintain disposal
equipment and	Disruption of surface	parameters		records.
shaping of quarry	drainage			
		See Appendix 10 for details		See Appendix 9 for details
Community and	Community conflicts	Monitoring incidences of complaints,	Appointed Contractor	During life of mine and record
labour relations	and tensions,	recording of key parameters		complaints, incidents and labour
management	Increased risk of fire,			statistics monthly.
	Reduced security on	See Appendix 10 for details		·
	area, Improved			See Appendix 9 for details
	employment rates,			''
	Improved skills			

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

Once the borrow pit is utilized by a contractor, they will be required to appoint an Environmental Control Officer, which then will be required to perform a monthly environmental compliance report which includes the borrow pit area.

#### m) Environmental Awareness Plan

(1) Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

All employees will go through an induction of general environmental issues and given specifics on their jobs. The training will include:

- Making employees aware that everyone has a right to a clean environment and that everyone has a responsibility to protect the environment.
- Explanation of the importance of complying with the EMP specifications.
- Discussion of the potential environmental impacts of operational activities and mitigation measures that must be implemented when carrying out activities.
- The importance of personal performance on dealing with environmental issued and explanations of the management structure of individuals responsible for matters pertaining to the EMP.
- Communication can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Records of all training done are to be kept.
- When encountering fossils, obtain a permit from the SAHRA. Any permitted removal of any archaeological or historical matter must be done under the strict supervision of a qualified registered heritage specialist.

Refer to Environmental Awareness Plan Appendix 11

# (2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.

- The applicant will endeavor to improve the competence and skills of personnel. A culture of environmental protection will be promoted.
- Procedures will be put in place to effectively minimize any identified high risk areas and to proactively control any environmental incidents if they occur.
- The applicant will also continuously improve and promote a code that goes beyond minimal compliance with environmental legislation.

## n) Specific information required by the Competent Authority (Among others, confirm that the financial provision will be reviewed annually).

Confirm

#### 2) UNDERTAKING BY EAP

The EAP herewith confirms

the correctness of the information provided in the reports  $\boxtimes$ a) the inclusion of comments and inputs from stakeholders and I&APs; b) the inclusion of inputs and recommendations from the specialist reports where c) relevant; Xand that the information provided by the EAP to interested and affected parties and any d) responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein. Signature of the environmental assessment practitioner: Name of company: Date: Signature of the Commissioner of Oaths: Name: Designation: Date: Official stamp of Commissioner of Oaths (below)

## Page intentionally left blank

# **APPENDIXES**

# **APPENDIX 1**

**EAP CURRICULUM VITAE** 

#### **CURRICULUM VITAE**

#### **CW Vermeulen**

1. Family name: Vermeulen

2. First name: CW

Date of birth: 1 January 1990
 Nationality: South African

5. Languages: Afrikaans and English

6. Education:

Institution	Degree(s) or Diploma(s) obtained
North West University Potchefstroom 2010 – 2014	BSc. Environmental and Biological Sciences

- 7. Present position: Director
- 8. Current Responsibilities Other skills (e.g computer literacy,etc.)
  - · Coordinating all specialist assessments
  - Free State Borrow Pit investigation Project Co-coordinator.
  - · Water Licenses and Environmental Authorisations.
  - Conduct Environmental Impact Assessments and other environmental investigations.
  - Conduct Environmental Compliance and other Environmental Audits.
  - Conduct Ecological Specialist Assessments.
  - Mining right and Mining permit applications
  - GIS Mapping

#### 9. Professional experience:

Date	1/05/2017 - Present
Organisation	Environmental Management Group
Position	Director

Date	6/2009 - 12/2010
Organisation	Krugersdorp Game Reserve
Position	Assistant Game Manager
Responsibilities	Game capturing, Grazing capacity evaluations, Assisting with lion breeding project.

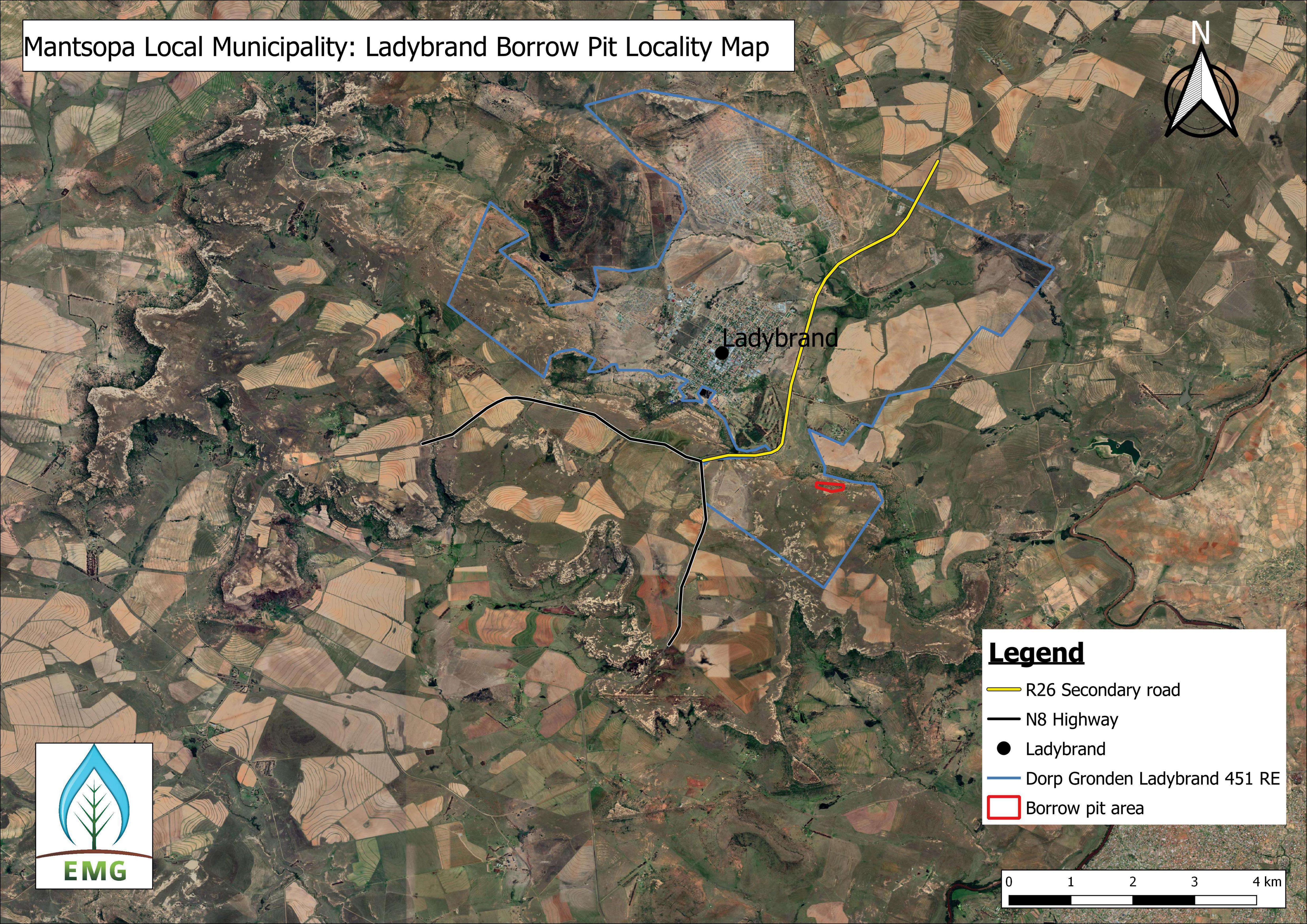
Date	1/2015 - 3/2015
Organisation	Zantow Environmental
Position	Environmental Specialist Consultant (Alien and Invasive Flora)
Responsibilities	Conducting specialist assessments concerning alien and invasive flora.

Organisation Hilland Environmental  Position Junior Environmental Assessment Practitioner and Environmental  Specialist (Aviforuse)	Date	4/2015 - 3/2016
	Organisation	Hilland Environmental
Specialist (Avilauna)	Position	Junior Environmental Assessment Practitioner and Environmental Specialist (Avifauna)

Date	3/2016 - 8/2016		
Organisation Bokamoso Environmental			
Position	Environmental Specialist (Fauna and Avifauna), Water Use License Application Consultant, General Environmental Consultant.		
Responsibilities	Conducting specialist Faunal and Avifaunal assessments. Applying for Water Use Licenses. GIS Mapping.		

# **APPENDIX 2**

**LOCALITY MAP** 



# **APPENDIX 3**

**PUBLIC PARTICIPATION** 



ENVIRONMENTAL MANAGEMENT GROUP

PUBLIC PARTICIPATION REPORT

NOTICE OF
APPLICATION FOR
ENVIRONMENTAL
AUTHORISATION OF
A MINING PERMIT

### **Contents**

1. INTRODUCTION	3
2. APPROACH AND METHODOLOGY	3
3. PUBLIC PARTICIPATION PROCESS CONDUCTED	3
3.1. NEWSPAPER ADVERTISEMENT	3
3.1.1 Newspaper Advert	4
3.2. SITE NOTICES	5
3.2.1 The poster was placed in surrounding area	0
3.3. DISTRIBUTION OF BACKGROUND INFORMATION DOCUMENT	2
POTENTIAL ENVIRONMENTAL IMPACTS	5
ENVIRONMENTAL AUTHORISATION	5
3.4 NOTIFICATION TO LOCAL AUTHORITIES & STAKEHOLDERS	7
3.4.1 BID circulated to all I&AP's, Stakeholders and Departments	7
3.5 NOTIFICATION TO LOCAL AUTHORITIES & STAKEHOLDERSError!	Bookmark not defin
3.5.1 Draft BAR circulated to all I&AP's, Stakeholders and Departments. Erro	or! Bookmark not de
3.5 LIST OF I&AP'S	8
4. CONCLUSION	9

#### **ABBREVIATIONS**

BID	Background Information Document
DWS Department of Water and Sanitation	
RI&APS	Registered Interested & Affected Parties
I&APS	Interested & Affected Parties
PPP	Public Participation Process

#### 1. INTRODUCTION

The Public Participation Process (PPP) forms an integral part of the rectification application process. It provides people with the opportunity to raise their issues and concerns about the proposed establishment of a Borrow Pit in Ladybrand. A comprehensive public participation process was conducted by EMG Consultants, to ensure that all identified Interested and Affected Parties (I&APs) were informed of the proposed project and their input is able to influence decision-making process with regards to the development.

#### 2. APPROACH AND METHODOLOGY

The Public Participation Process was conducted as per Regulation 39, 40, 41, 42, 43 & 44 of the Environmental Impact Assessment Regulations 2014 (as amended 07 April 2017) and the Public Participation Guidelines, 2017 were considered. Steps, which were taken to inform the identified I&APs and surrounding community of the proposed development included:

- Newspaper advertisement;
- On site Notice and Posters;
- ♣ Notifications, i.e. Distribution of Background Information Document (BID) to neighbouring property Owners & Stakeholders.

#### 3. PUBLIC PARTICIPATION PROCESS CONDUCTED

The methods that were undertaken during conducting of the public participation process as discussed in detail below.

#### 3.1. NEWSPAPER ADVERTISEMENT

The project was advertised in the Vrystaatkroon newspaper, on the 14<sup>th</sup> of July 2021 to inform the I&APs of the Application for Environmental Authorisation of a Mining Permit for the establishment of a Borrow Pit in Ladybrand.

## NOTICE OF APPLICATION FOR ENVIRONMENTAL AUTHORISATION OF MINING PERMITS

Notice is hereby given in terms of regulation 41 of Government Notice No. R326 under the National Environmental Management Act (Act 107 of 1998) as amended 7 April 2017, Mineral and Petroleum Resources Development Act 28 OF 2002 as amended of intent to carry out the following projects:

#### APPLICATION FOR ENVIRONMENTAL AUTHORISATION OF MINING PERMITS

NEMA: Listing Notice 1 (NO. 327, 07 APRIL 2017)

R327	21	Any activity including the operation of that activity which requires a mining permit
		in terms of section 27 of the Mineral and Petroleum Resources Development Act,
		2002 (Act No. 28 of 2002), including —
		(a) associated infrastructure, structures and earthworks, directly related to the
		extraction of a mineral resource[,]; or [including activities for which an
		exemption has been issued in terms of section 106 of the Mineral and
		Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]
		<ul><li>(b) the primary processing of a mineral resource including winning, extraction,</li></ul>
		classifying, concentrating, crushing, screening or washing;
		but excluding the secondary processing of a mineral resource, including the
		smelting, beneficiation, reduction, refining, calcining or gasification of the
		mineral resource in which case activity 6 in Listing Notice 2 applies.
R327	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of
		indigenous vegetation, except where such clearance of indigenous vegetation is
		required for—
		the undertaking of a linear activity, or
		<ol> <li>maintenance purposes undertaken in accordance with a maintenance</li> </ol>
		management plan

LOCATIONS: Excelsior, situated on the farm Excelsior, 358 on remaining extent

Hobhouse, situated on the farm Gorra's Stad, 75 on portion 2

Ladybrand, situated on the farm Dorp Gronden Lady Brand 451, remaining extent. Tweespruit (Thaba Patchoa), situated on the farm Mammas Hoek 802, remaining

extent

PROPONENT: Mantsopa Local Municipality Free State

CONSULTANT: ENVIRONMENTAL MANAGEMENT GROUP

PO BOX 37473

LANGENHOVEN PARK, 9330

TEL: 051 412 6350

CELL PHONE: 082 824 9308 EMAIL: <a href="mailto:com/oen/mailto:com

In order to ensure that you are identified as an interested and/or affected party, please submit your name, contact information and interest in the matter to the consultant given above.

Thirty days are allowed for your comments to reach us as per NEMA (Act 107, 1998, amended 7 April 2017), GNR 326.

8 NUUS NEWS VrvstaatKroon 14 Julie 2021

# Nuutste note se boodskap sterk

Die veelsydige musikant en liedjieskrywer Kate Rok se nuwe enkelsnit, "Maangenade", is op haar verjaardag, 1 Julie, bekend

Kate is 'n donkerkop-superster met 'n Voortrekkerkappie wat simbolies is van die sterk vroue wat sy bewonder, asook haar onwrikbare trots in haar kultuur en herkoms. Haar musiek is net so uniek en emosievol soos sy.

Dié gebore en getoë Bethlehemiet woon in Clarens en

het geen bekendstelling in die plaaslike musiekbedryf nodig nie. "Maangenade" is op 2 Julie landwyd aan alle radiostasies

uitgereik.
"Hierdie lied het ek geskryf om te onthou dat, ondanks die seer in 'n mens se lewe, daar ook soveel mooi en lekker dinge is," sê Kate. "As jy daarop fokus, vind jy

genesing in die vreugde van soveel ander goed – soos familie, vriende en die natuur.

"Ek raak soms baie vies oor die situasie in die land, maar dan besef ek dat die genade van my opvoeding en hoe ek redeneer, gesetel is in kennis wat ek onverdiend ontvang het. "As jy besef hoe groot rol jou

genade-aandeel in jou lewe speel, behoort jy meer empatie en liefde uit te deel, ongeag van aan wie dit is."

Kate se treffende nuwe enkelsnit



op haar verjaardag vanjaar uitgereik. ILLUSTRASIE: VERSKAF

het 'n meegaande musiekvideo wat op 6 Julie bekend gestel is. Dit is op haar familie se prentjiemooi plaas by Clarens verfilm.

Die land en sy probleme inspireer Kate om liedjies te skryf, 'n vaardigheid wat sy al van haar skooldae af slyp. Sy het as driejarige kind begin sing. Sy hoop om mense met haar

musiek te motiveer om 'n verskil

in ander se lewe te maak. Haar musiek is op 'n verskeidenheid digitale platforms heskikhaar.



#### Hoop op genoeg stemme om VS trots te maak

Senekal is as finalis in Kwêla se dorp van die jaar-kompetisie benoem. Om vir Senekal te stem, SMS die woord "Senekal" na 33157. Die stemlyn sluit Vrydag (16/07) om middernag. 'n SMS kos R1,50 en 'n maksimum van 30 SMS'e per selfoonnommer word toeselaat. FOTE: SPAKAL MATWAREN COMMUNITY PORUM

#### Sal die speke laat sing vir Olimpiese roem

'n Oud-Kroonstadter en bekende in nasionale fietsrykringe is vir die Suid-Afrikaanse span gekie wat aan die Olimpiese Spele in Tokio gaan deelneem. David Maree (31) is 'n gesoute fietsryer wat met die wêreld se bestes in baanfietswedrenne sal meeding. Soos elke ander deelnemer hoop Maree dat sy harde werk en veggees hom 'n Olimpiese medalje sal besorg.





MOOHAKA LOCAL MUNICIPALITY NOTICE IN TERMS OF SECTION 46 OF THE LOCAL GOVERNMENT MUNICIPAL FINANCE MANAGEMENT ACT, NO. 56 OF 2003

Notice is hereby given in terms of Section 46 of the Local Government: Municipal Finance Management Act, No. 56 of 2003 that:

Moqhaka Local Municipality intends entering into a contract for the Supply and Delivery of Municipal Fleet on a Finance Lease Contract for a period of three (3) years. The contract will impose financial obligations on the Municipality for the next three (3) annual budgets. At the end of the Finance lease term, the ownership of this fleet will transfer to the municipality. The appointment of the service provider is in line with the Municipality's Supply Chain Policy and the service provider will be responsible for the supply of Municipal Fleet on a finance lease basis.

NOTICE IS FURTHER GIVEN in accordance with Section 21 and Section 21A of the Local

Government Municipal Systems Act, No. 32 of 2000 that – (bb) The local community and other interested persons/ parties are invited to submit comments or representations to the Municipality in respect of the proposed drafts proposal. Such comments or representations must be received by no later than 13 August 2021 via electronic mail on the email address provided below or be delivered to the mailing address provided hereunder.

royv@moqhaka.gov.za; agnesm@moqhaka.gov.za; cfosec@moqhaka.gov.za

Copies of the draft contract and information statement summarizing the Municipality's obligations in terms of the contract are available for inspection at the locations listed hereunder and will also be accessible on <a href="www.moqhaka.gov.za">www.moqhaka.gov.za</a> (http://www.moqhaka.gov.za/) (Official website of the Municipality).

Further details and clarity may be requested via email on tshepisos@moghaka.gov.za or 056 216 9245; 056 216 9183; 056 216 9143

PHYSICAL ADDRESS MAILING ADDRESS Moghaka Local Municipality Hill Street Tender Box Ground Floor

SUBMISSION MUST BE MARKED: SECTION 46 SUPPLY AND DELIVERY OF

MUNICIPAL FLEET

#### NOTICE OF APPLICATION FOR **ENVIRONMENTAL AUTHORISATION OF MINING PERMITS**

Notice is hereby given in terms of regulation 41 of Government Notice No. R326 under the National Environmental Management Act (Act 107 of 1998) as amended 7 April 2017, Mineral and Petroleum Resources Development Act 28 OF 2002 as amended of intent to carry out the

#### APPLICATION FOR ENVIRONMENTAL AUTHORISATION OF MINING PERMITS

NEMA: Listing Notice 1 (NO. 327, 07 APRIL 2017)

Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Developme 2002 (Act No. 28 of 2002), including —

(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource[,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]

 (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.

The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-

the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance

Excelsior, situated on the farm Excelsior, 358 on remaining extent Hobhouse, situated on the farm Gorra's Stad, 75 on portion 2 Ladybrand, situated on the farm Dorp Gronden Lady Brand 451, remaining extent. Tweespruit (Thaba Patchoa), situated on the farm Mammas Hoek 802, remaining

R327 27

LOCATIONS:

PROPONENT: Mantsopa Local Municipality Free State

CONSULTANT: ENVIRONMENTAL MANAGEMENT GROUP

PO BOX 37473

LANGENHOVEN PARK, 9330 TEL: 051 412 6350

CELL PHONE: 082 824 9308 EMAIL: cwv@envmgp.com

In order to ensure that you are identified as an interested and/or affected party, please submit your name, contact information and interest in the matter to the consultant given above

Thirty days are allowed for your comments to reach us as per NEMA (Act 107, 1998, amended 7 April 2017), GNR 326.

#### 3.2. SITE NOTICES

On site notices was placed on the 2<sup>nd</sup> of June 2021, to bring the Application for Environmental Authorisation of a Mining Permit for the establishment of a Borrow Pit in Ladybrand to the attention of I&APs including surrounding land users.



### 3.2.1 The poster was placed in surrounding area.





#### 3.3. DISTRIBUTION OF BACKGROUND INFORMATION DOCUMENT

For notification of I&APs about the proposed project, a BID, shown below was compiled, and it was sent to the identified I&APs.



NOTICE OF
APPLICATION FOR
ENVIRONMENTAL
AUTHORISATION OF A
MINING PERMIT

#### **ENVIRONMENTAL MANAGEMENT GROUP**

Notice of Application for Environmental Authorization of a Mining Permit

#### CHRISTIEN KRUGER

**Background Information Document** 

# Background Information Document for the Notice of Application for Environmental Authorization of a Mining Permit

**June 2021** 

#### **INTRODUCTION**

Environmental Management Group is applying for Environmental Authorisation on behalf of Mantsopa Local Municipality for the Application for Environmental Authorization of a Mining Permit in Ladybrand.

#### **LOCALITY**

The proposed Borrow Pit will be located near Ladybrand on remaining extent of farm Dorp Gronden Lady Brand 451, which falls under the Mantsopa Local Municipality, in the Free State Province.

#### **ENVIRONMENTAL AUTHORISATION**

Prior to the commencement of the proposed Borrow Pit establishment, Environmental Authorization in terms of the National Environmental Management Act (NEMA), 107 of 1998, as amended 7 April 2017 is required from the competent authority Department of Mineral Resources (DMR). The Environmental Assessment Process will be conducted in terms of the 2014 NEMA environmental impact assessment (EIA) Regulations, GNR 326 as amended.

According to the National Environmental Management Act (Act 107 of 1998) as amended 7 April 2017, Listing Notice 1 (NO. 327, 07 APRIL 2017) – R 327 the following activity applicable to this project:

- Activity 21: Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including
  - (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource[,]; or [including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)]
  - (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies

#### PURPOSE OF THIS DOCUMENT

EMG has prepared this document to inform you about:

- The proposed application;
- The current understanding of the baseline environmental and social conditions;
- The required environmental assessment processes;
- Possible environmental impacts and proposed specialist studies;
- How you can have input into the Environmental Authorization;

#### YOU'RE ROLE

You have been identified as an interested and/or affected party (I&AP) who may want to be informed about the proposed project and have input into the environmental assessment processes and environmental reports.

You have an opportunity to review this document and provide your initial comments to us for incorporation in the environmental assessment process. You will also be given the opportunity to provide input at the public meeting, if the need arises. And to review and comment on some reports:

♣ Draft BAR

Comments will be recorded and included in the reports submitted to the relevant authorities for decision-making.

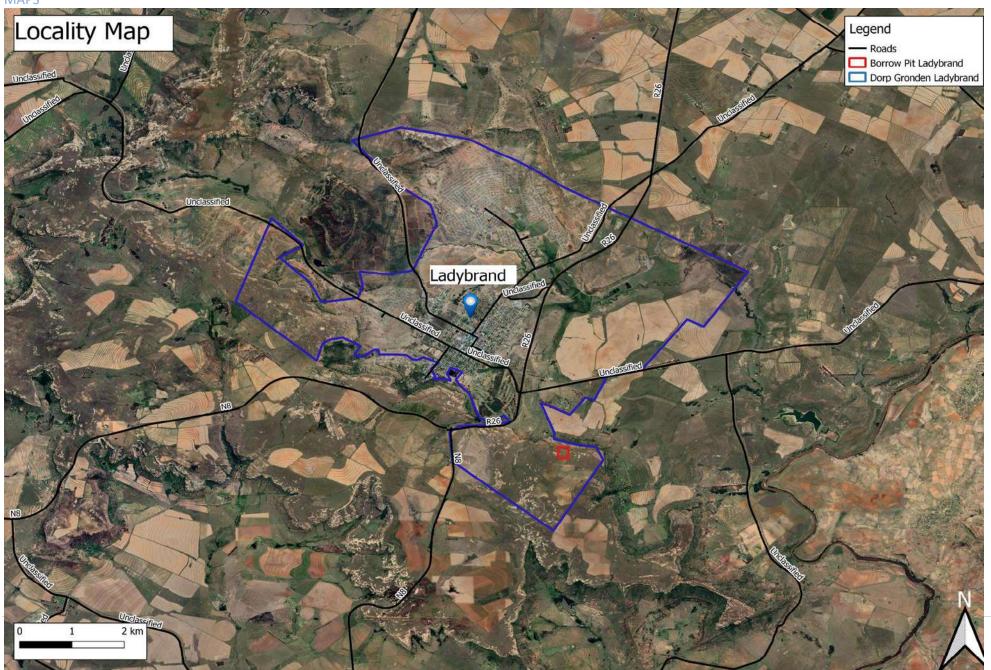
#### **HOW TO RESPOND**

If you are interested in receiving further information on the project please register your details with the persons listed below. Responses to this document can be submitted by means of the attached comments sheet and/or through communication with the persons listed below. Christien Kruger

- Activity 27: The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-
  - (i) the undertaking of a linear activity; or
  - (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

.





#### PROJECT DESCRIPTION

Environmental Authorisation is required for a Mining Permit for a Borrow pit less than 5ha. In order to provide gravel (dolerite) material for construction purposes, extraction of gravel (dolerite) from a quarry by means of surface mining is needed. As well as the primary processing of a dolerite including winning, classifying, concentrating, crushing, screening and washing.

### POTENTIAL ENVIRONMENTAL IMPACTS

Below is a preliminary list of potential impacts identified at this stage of the process and will be investigated as part of the environmental assessment process. The list will be refined during the course of the Basic Assessment Process.

- Ecological assessment
- Heritage impact assessment

### **ENVIRONMENTAL AUTHORISATION**

The environmental assessment processes will be conducted to inform the competent authorities in their decision-making. These processes are conducted simultaneously.

#### STEPS IN THE ENVIRONMENTAL AUTHORISATION PROCESSES

The environmental authorisation processes provides information on the project and environment in which it is being undertaken; identifies, in consultation with registered interested & affected parties (RI&APs), the potential negative as well as positive impacts of the project; and reports on management measures required to mitigate impacts to an acceptable level. The likely process steps and timeframes are provided below. RI&APs and other stakeholders on the project's database will receive notification of public participation opportunities in advance.

#### **PUBLIC PARTICIPATION**

Public Participation provides Stakeholders and I&APs the opportunity to raise issues of concern and comment on the proposed activity. Notify other regulatory authorities and I&APs of project and environmental assessment (via newspaper advertisements, site notices and this BID document)

	PROCESS STEPS (in accordance with GN R326)	RESPONSIBLE PARTY	TIMEFRAME
1.	Initial communication to clarify the application with the Authorising Department.	EAP	1 day
2.	EAP to conduct a site investigation	EAP	1 day
3.	EAP to submit Basic Assessment Application to competent authority.	EAP	1 day
4.	Competent authority Accepts Application	DMR	14 days
5.	EAP to undertake the BAR and compile a Report (including the draft EMP) subjected to 30 days Public Participation Process	EAP	90 days
6.	EAP to submit Final BAR report inclusive of comments to competent authority.	EAP	1 day
7.	Competent Authority to grant environmental authorisation	DMR	107 days
8.	Environmental Authorisation subjected to 20-day appeal process	EAP	20 days
9.	Final Approval of Environmental Authorisation	DMR	1 day

#### PARTIES INVOLVED IN THE ENVIRONMENTAL APPLICATION PROCESSES

#### **IAPs**

 Surrounding landowners, land users and communities

#### **KEY STAKEHOLDERS**

- Department of Rural Development and Land Reform
- Department Of Agriculture and Rural Development
- Department of Water and Sanitation (DWS)
- Department of Heritage (SAHRIS)
- Department of Public Works and Infrastructure

#### **LOCAL AUTHORITIES**

- Mantsopa Local Municipality
- Thabo
   Mofutsanyana
   District Municipality
- Mayor & Ward Councillor

Please let us know if there are any additional parties that should be involved.

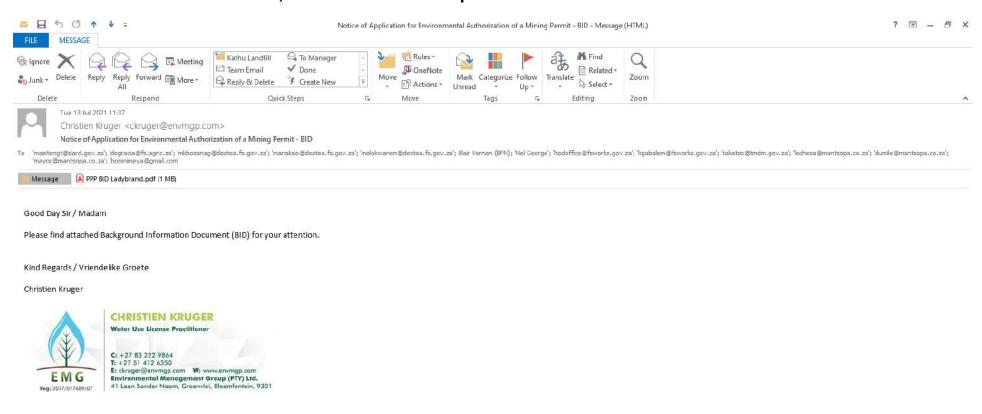
Notice of Application for Environmental Authorization of a Mining Permit				
Registration and Response Form	for Interested	and Affected Parties (I&AP)		
Date				
Julia				
Particulars of the I&AP				
Name				
Postal Address & Code				
Street Address & Code				
Telephone number	Cell Phone Number			
Fax Number	E-Mail Address			
Please Identify your Interest in the Proposed Project:		•		
Please write your comments and questions here:				
Please return completed document prior to 30 days I	ansing to:			
Christien Kruger	uponing to.			

ENVMGP Tel: 051 412 6350 Fax: 086 556 2152

Email: ckruger@envmgp.com
Website: envmgp.com

#### 3.4 NOTIFICATION TO LOCAL AUTHORITIES & STAKEHOLDERS

#### 3.4.1 BID circulated to all I&AP's, Stakeholders and Departments.



### 3.5 LIST OF I&AP'S

List of Stakeholders and I&AP's					
Department / Organisation	Contact Person	E-Mail Address	Address	Contact Nr	
Department of Agriculture and	Dr T Masiteng	masitengt@dard.gov.za -	Gielie Joubert St	051 861 8363 – 060 983	
Rural Development		degracia@fs.agric.za	Glen, BFN, 9360	8820	
Department of Economic	Mrs Grace	mkhosanag@destea.fs.gov.za -	113 St Andrews Street	051 400 4800	
Development, Tourism,	Skosana	manakeo@destea.fs.gov.za -	Bloemfontein		
Environmental Affairs & Small		molokwanen@destea.fs.gov.za	9300		
Business					
Department of Water &	Mr. Vernon Blair	BlairV@dws.gov.za,	Bloem Plaza	051 405 9000	
Sanitation	Deputy Director:	NelG@dws,gov.za	2nd Floor c/o Charlotte Maxeke & East	082 807 3552	
	Water Use		Burger Streets, Bloemfontein, 9300		
Free State Department of Public	Mr M Mohlahlo	hodoffice@fsworks.gov.za –	Room 146, OR Tambo House	051 492 3915	
Works and Infrastructure		kgabalem@fsworks.gov.za	Cnr St, Andrews and Markgraaf		
			Streets		
			Bloemfontein		
			9300		
Thabo Mofutsanyana District	Ms. Takatso	takatso@tmdm.gov.za	Old Parliament Building	Tel: (058) 718 1036 / 1089	
Municipality	Lebenya		1 Mampoi Street		
			PHUTHADITJHABA		
			9870		
Mantsopa Local Municipality	Mr. T.P Masejane	lechesa@mantsopa.co.za -	No 38 Joubert Street	051 924 0654	
		dumile@mantsopa.co.za	Ladybrand		
			9745		
Mantsopa Local Municipality	Mayor	mayor@mantsopa.co.za	No 38 Joubert Street		
			Ladybrand		
			9745		
Mantsopa Local Municipality	Mrs BE Meya	boninimeya@gmail.com	No 38 Joubert Street		
Ward 3 Councilor			Ladybrand		
			9745		

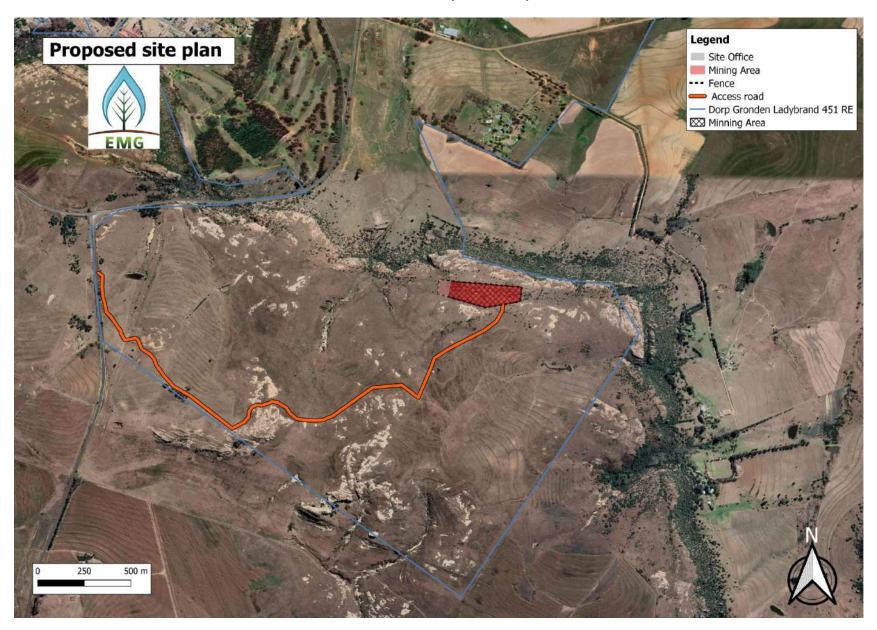
#### 4. CONCLUSION

It is concluded that the methods incorporated in the public participation process to inform the surrounding landowners, users, organs of state and identified government authorities was adequate. All the identified I&APs were given with an opportunity to give input regarding the Notice of Application for Environmental Authorization of a Mining Permit and no objections were received

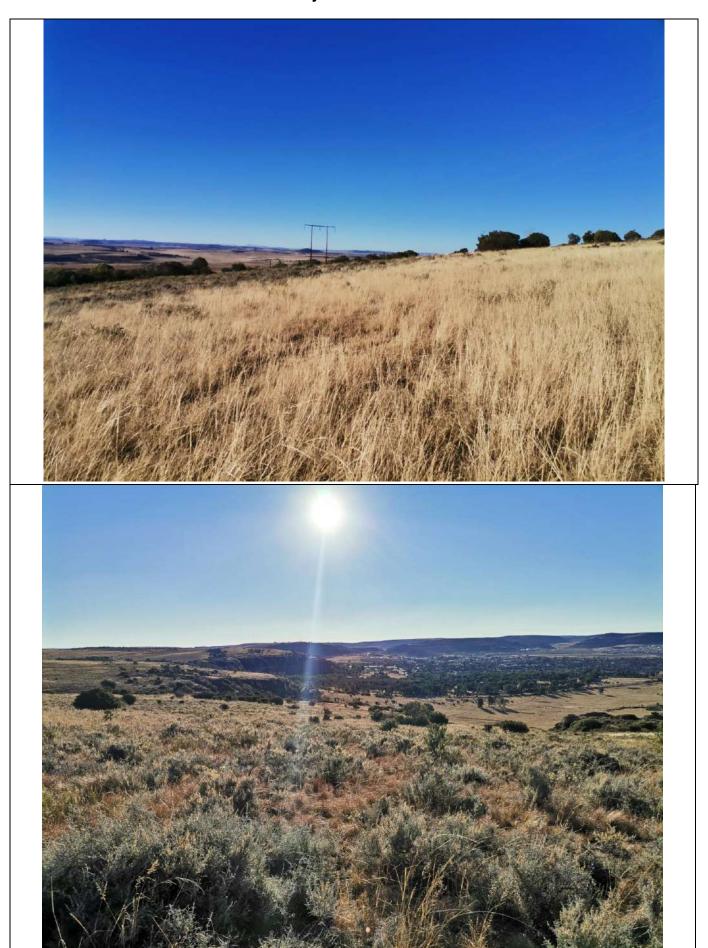
## **APPENDIX 4**

PROPOSED SITE PLAN and ON SITE SURVEY

APPENDIX 4.1: Proposed site plan



APPENDIX 4.2: Site Photos taken on the 2 July 2021







## **APPENDIX 5**

**IMPACTS AND RISKS ASSESSMENT REPORT** 

#### **IMPACTS AND RISKS REPORT**

#### Introduction.

This report describes the environmental impacts and risks identified during the environmental impact assessment carried out for the quarry.

Environmental Impact Assessment is a structured approach for obtaining and evaluating environmental information prior to its use in decision-making in the development process. This information consists, basically, of predictions of how the environment is expected to change if certain alternative actions are implemented and advise on how best to manage environmental changes if one alternative is selected and implemented. NEMA through the EIA regulations requires that listed activities that have, or are likely to have a detrimental effect on the environment should be authorised and a license applied for before commencement. An EIA must be done as stipulated in the EIA regulations made under section 24(5) of NEMA. The EIA process used for this project refers to the process which involves the identification and assessment of direct, indirect and cumulative environmental impacts of a proposed project. In addition to this the specific requirements for environmental assessments as stipulated in the Minerals and Petroleum Resources Development regulations were also taken into account to ensure that all aspects of the impacts and risks were taken into account.

The report contains the following appendixes to comply with the requirements of the Basic Assessment Report and Environmental Management Program.

APPENDIX 5.1: Nature of the Impacts and Risks Identified

**APPENDIX 5.2**: Methodology Used in Assessing the Impacts and Consequences.

**Appendix 5.3:** Assessment of the Impacts and Risks before Mitigation

Appendix 5.4: Possible Mitigation Measures that could be applied and the level of risk.

**Appendix 5.5:** Assessment of the Impacts and Risks after Mitigation

**Appendix 5.6:** Assessment of the No-Go Alternative.

### APPENDIX 5.1: IMPACTS AND RISK IDENTIFIED INCLUDING THEIR NATURE, SIGNIFICANCE CONSEQUENSES, EXTENT PROBABILITY AND REVERSIBILITY

#### 1) DESCRIPTION OF THE NATURE OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

#### a) Destruction of Flora and Habitat Loss

The mine/quarry establishment will result in net vegetation loss during the establishment and the operational phases. Net vegetation loss will result in secondary impacts on fauna due to habitat loss. Direct loss or damage to habitat leads to reduced foraging/food resources, disturbance and displacement of fauna. If invasive weeds find themselves in the area as a result of being accidentally carried into the area, for example along tyres of vehicles, there might be a weed invasion/proliferation of opportunist species. This will threaten indigenous vegetation species. Whilst assessment noted that the site does not have rare or endangered species, the removal of vegetation need to be carefully managed to limit the impacts.

#### b) Air Quality Deterioration

Stripping of soil and vegetation and excavating for gravel can result in dust emissions. Dust can cause adverse environmental impacts such as soiling of property or surfaces, visual impacts and personal discomfort (for example, gritty eyes) and can also cause considerable annoyance to people and respiratory problems for sensitive people. It can be a very contentious issue, particularly for heavy dusty activities. Wind whipping can result in dust emission from stockpiles and bare surfaces. The mobilisation of vehicles and equipment on site can result in excessive vehicular emissions such as smoke if they are not properly maintained. Dust pollution can also be very problematic due to the concentration of heavy machinery and vehicle on the gravel access roads in the area during the operational phase.

#### c) Visual Impact

Disturbance of the mine/quarry area and excavated areas can cause visual scarring of the environment if not properly handled. Before rehabilitation, during operational phase, the mine/quarry surfaces with bare patches may contrast with the surrounding area that has vegetation, making the site unpleasant.

#### d) Land and Soil Contamination and Erosion Impacts

Soil surface erosion, loss of topsoil and deterioration of soil quality and productivity may occur due to the removal of stabilising vegetation from certain areas in order to facilitate work. Soils may also be compacted by heavy vehicles and construction equipment. Once disturbed, soils become more susceptible to erosion. Also associated with land pollution is the disposal of waste. Careless unregulated waste management practices during operation of the quarry will exacerbate this problem. Oil and fuel leakages from the vehicle and material stored can cause soil contamination by hazardous substances if they occur. Improper disposal of food cartons and other domestic forms of mining garbage could lead to littering of the site and pollution.

#### e) Water Conservation and Water Pollution

The mine/quarry operation will require use of water mainly for dust suppression. Water is a scarce resource and needs to be conserved. The impact of using water resources for dust suppression should be weighted up against the impact of dust. Poor waste management practices at the mine/quarry site areas may lead to the contamination of water. Sewage and sanitary effluent has the potential to adversely affect the quality of water if not properly handled. Fuel leakage and chemical spills can also cause problems to water resources. These may be washed during rains and end up polluting water bodies.

#### f) Disruption of Surface Drainage

Failure to incorporate drainage control systems on site and from excavated area can lead to interruption of natural drainage. Natural movement of surface water might be changed. The mine/guarry might form a pool(s), depriving

areas that normally get surface water, of the resource. Ecosystem functions that depend on natural water surface drainage of the area will be negatively affected. Drowning of animals may occur in the formed pools.

#### g) Slope Instability

Unstable slopes or slope failure of excavated surfaces may result in safety problems if the excavation is not managed.

#### h) Erosion

Removal of vegetation cover and the disturbance of soils can lead to soil erosion during rainy periods where soil is loose.

#### i) Noise and Vibration

The proposed mine/quarry development is anticipated to cause increased noise levels in the area during the operational phase, due to the movement of construction vehicles and machinery. If drilling and blasting is done this can be a major source of noise. Noise and vibration generated during operational phase has the potential to cause annoyance and disturbance effects on noise sensitive receptors, ear damage to workers and cause damage to structures as a result of vibration if operations are not handled properly.

#### j) Increased Risk of Fire

The presence of workers and mine/quarry operational related activities poses an increased risk of veld fires. The potential risk of veld fires is heightened during windy conditions in the area. Fire may result in the loss of grazing vegetation and would therefore impact negatively on the affected community's livelihoods. Changes to the fire regime may impact on ecosystem integrity and biodiversity in the long term.

#### k) Safety and Security Risks

Conduct of mine/quarry workers is also important in considering public safety. Trespassing and illegal access onto private land may compromise the safety of local communities. As the mine/quarry development is taking place in a farming area, collisions with livestock are likely to be present as a hazard.

#### I.) Creation of Employment Opportunities And Skills Development

The development of the mine/quarry is expected to create employment opportunities during operation of the quarry mine in the area. Some will be low skilled positions (i.e. Administrative clerk etc.) and semi-skilled workers (i.e. drivers, equipment operators etc.) and some skilled personnel (i.e. operational management etc.) Although the development of the mine is a small operation, and does not guarantee the generation of significant employment opportunities there is need to maximise the employment opportunities for the locals.

#### m). Skills Development Impacts

The majority of the training benefits are likely to accrue to personnel employed by the relevant beneficiaries. The training should provide for meaningful skills development for members from the local community.

### APPENDIX 5.2: METHODOLOGY USED IN DETERMINING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF THE POTENTIAL IMPACTS.

The mine/quarry development will result in a number of environmental impacts and risks so it is important to determine the critical ones so that effort can be concentrated in managing them. The following criterion was used to determine the significance of the impacts. The criterion takes into account the nature of the impact, the duration the extent, the magnitude, and the likelihood of occurrence to determine the significance of the potential impact.

The following ratings will be used.

The <u>duration</u> was assigned a score of 1 to 5 where:

- 1 The lifetime of the impact will be of a very short duration.
- 2 The lifetime of the impact will be of a short duration.
- 3 Assigned to medium-term (5–15 years)
- 4 Assigned to long term (> 15 years)
- 5 Permanent.

The <u>magnitude</u>, quantified on a scale from 0-10, where a score is assigned:

- 0 is small and will have no effect on the environment
- 2 is minor and will not result in an impact on processes
- 4 is low and will cause a slight impact on processes
- 6 is moderate and will result in processes continuing but in a modified way
- 8 is high (processes are altered to the extent that they temporarily cease)
- 10 is very high and results in complete destruction of patterns and permanent cessation of processes

The <u>extent</u> indicates whether the impact will be local (limited to the immediate area or site of development), regional, national or international. A score of between 1 and 5 is assigned as appropriate (with a score of 1 being low and a score of 5 being high). The scores are as follows:

- 1 Local immediate area
- 2 Local immediate area and surroundings
- 3 Regional
- 4 National
- 5 International

The probability of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, score of 1–5 where:

- 1 is very improbable (probably will not happen)
- 2 is improbable (some possibility, but low likelihood)
- 3 is probable (distinct possibility)
- 4 is highly probable (most likely)
- 5 is definite (impact will occur regardless of any prevention measures)

The significance, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high. The significance is determined by combining the criteria in the following formula:

E = Extent, D = Duration, M = Magnitude, P = Probability

The <u>status</u> of the impact describes whether the impact will have positive, negative or neutral ramifications of the environment.

The significance weightings for each potential impact are as follows:

Value	Significance
<30 points	Low (i.e. where this impact would not have a direct influence on the decision
	to develop in the area)
30-60 points	Medium (i.e. where the impact could influence the decision to develop in the
	area unless it is effectively mitigated)
>60 points	High (i.e. where the impact must have an influence on the decision process
	to develop in the area)

#### APPENDIX 5.3: THE ASSESSMENT OF IMPACTS BEFORE MITIGATION OF THE IMPACTS.

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
	START-UP ACTIVIT	IES									
		Loss of vegetation	Neg	2	9	1	5	60	High	Reversible	No
		Habitat destruction	Neg	2	6	1	5	45	Medium	Reversible	No
	Cita	Visual scarring	Neg	2	2	2	5	45	Medium	Reversible	No
	Site establishment	Air quality deterioration	Neg	1	2	2	4	20	Low	Reversible	No
1	activities,	Soil erosion	Neg	2	4	2	2	16	Low	Reversible	No
	vegetation stripping	Potential loss of agricultural potential	Neg	2	2	1	4	20	Low	Reversible	No
		Impact of use of water during all operations	Neg	1	2	1	4	16	Low	Reversible	No
		Safety and security	Neg	1	2	2	2	10	Low	Reversible	No
2	Soil stripping and	Dust	Neg	1	4	2	2	14	Low	Reversible	No
2	stockpiling	Disruption of drainage	Neg	3	2	2	2	14	Low	Reversible	No
	DURING OPERATION	DNAL PHASE							-		
		Visual impact	Neg	3	6	2	5	55	Medium	Reversible	No
3	Clearance of area for mining	Destruction of flora and habitat	Neg	3	6	1	5	50	Medium	Reversible	No
	TOT HILLING	Loss of agricultural potential	Neg	3	7	2	4	48	Medium	Reversible	No
		Dust emissions	Neg	2	4	2	5	40	Medium	Reversible	No
4	Material excavation	Drainage disruption	Neg	2	5	2	3	27	Low	Reversible	No
		Slope instability	Neg	2	6	1	4	36	Medium	Reversible	No

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
		Noise	Neg	1	2	1	4	16	Low	Reversible	No
		Visual Scarring	Neg	3	7	2	4	48	Medium	Reversible	No
		Soil erosion	Neg	2	4	2	4	32	Medium	Reversible	No
		Altered topography	Neg	5	7	1	4	52	Medium	Irreversible	No
5	Drilling & blasting	Noise and vibrations	Neg	1	3	1	5	25	Low	Reversible	No
5	(if done)	Air quality Deterioration	Neg	1	3	1	5	25	Low	Reversible	No
		Dust	Neg	1	2	1	3	12	Low	Reversible	No
6	Stockpiles	Surface disturbances	Neg	2	2	1	3	15	Low	Reversible	No
		Drainage disruption	Neg	1	2	1	3	12	Low	Reversible	No
		Dust	Neg	1	2	2	4	20	Low	Reversible	No
7	Material handling, hauling	Increased risk of accidents	Neg	2	2	1	2	10	Low	Reversible	No
,	and	Noise	Neg	1	2	1	3	12	Low	Reversible	No
	transportation	Soil contamination from oil/fuel leaks	Neg	2	2	1	3	15	Low	Reversible	No
	Waste Disposal	Soil contamination	Neg	2	2	1	3	15	Low	Reversible	No
8	and Material	Water pollution	Neg	2	2	2	3	18	Low	Reversible	No
	storage	Increased risk of fire	Neg	2	2	1	3	15	Low	Reversible	No
	DURING CLOSURE	AND POST CLOSURE									
		Noise	Neg	1	2	1	3	12	Low	Reversible	No
	Decommissioning	Dust	Neg	1	2	1	3	12	Low	Reversible	No
9	of site and shaping of quarry	Soil contamination from oil/fuel	Neg	1	2	1	3	12	Low	Reversible	No
		Disruption of surface	Neg	1	2	1	3	12	Low	Reversible	No

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	Significance Rating Before Mitigation		Is Impact Reversible? Yes/No	Irreplaceable Loss of Resources? Yes/No
		drainage									
	SOCIO ECONOMIC	IMPACTS									
	Negative socio-	Community conflicts and tensions	Neg	2	2	2	2	12	Low	N/A	N/A
10	economic impacts	Increase risk of fire	Neg	2	2	2	2	12	Low	N/A	N/A
		Reduced security in area	Neg	2	2	2	2	12	Low	N/A	N/A
11	Positive socio	Employment opportunities	Pos	2	2	2	2	12	Low	N/A	N/A
11	economic impacts	Training and Skills Development	Pos	2	2	1	2	10	Low	N/A	N/A
	HERITAGE RESOUR	RCES IMPACTS									
11	Heritage impacts	Potential impacts associated with site of a cultural or archaeological importance	Neg	5	2	1	1	8	Low	Irreversible	Irreplaceable if it occurs
	CUMULATIVE IMP	ACTS									
12		Increased loss of vegetation	Neg	2	6	1	5	45	Medium	Reversible	No

### APPENDIX 5.4: POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK

#### 1. INTRODUCTION

These technical and management processes in this section have been developed to enable the applicant to mitigate negative environmental impacts and to provide a proactive approach to manage identified environmental risks. It provides systematic and explicit mitigation and monitoring measures for the proposed mine/quarry to ensure implementation during the planning, construction, operational and decommissioning phase of the project. It also mandates the Department to internalise the environmental impacts that would otherwise be a social cost.

#### 2. PERMITS AND PERMISSIONS

All pertinent permits, approvals and agreements are to be obtained before activities commence on site and the conditions are to be strictly adhered to.

#### 3. GENERAL SITE ESTABLISHMENT

**Objective:** To ensure proper control of the mining area.

#### **Management measures**

- Access at the mine area shall be controlled and adequate precautions taken to prevent unauthorised entry to the mine/guarry. A fence or other barrier should be erected to restrict access
- The area must be clearly demarcated along its boundaries.
- Permanent beacons must be firmly erected and maintained in their correct position throughout the life of the operation.
- Resultant operations shall only take place within this demarcated area.
- Mine boundaries shall be signposted and laid out so as to be clearly visible and identifiable.
- Entry to the mine area shall be controlled and unauthorised entry prohibited.
- Adequate precautions shall be taken to protect persons present at, or in the vicinity of, the mine from risks that may arise from mine operations

Time Schedule for Implementation: At start-up and throughout life of mine.

#### 4. MINING AREA LAYOUT PLAN

Objective: To ensure proper control of the mining area

#### Management measures

- A copy of the layout plan of the mine/quarry must be available at the mining site for scrutiny when required.
- The plan should be updated on a regular basis with regards to the actual progress of establishment of surface infrastructure, mining operations and rehabilitation.
- The final layout plan must be submitted to DMR at the closure of the mine/quarry or when operations have ceased.

 Beacons as indicated on the layout plan or as prescribed by the DMR must be firmly erected and maintained in their correct positions throughout the life of the operations.

**Time Schedule for Implementation:** At start-up and throughout life of mine.

#### 5. ESTABLISHMENT OF SITE OFFICE/CAMP

- The planning and design for the Site infrastructure must ensure that there is a minimum impact on the environment. Where possible existing infrastructure and disturbed areas must be used.
- No construction camps will be allowed in sensitive areas such as wetlands.
- The area size chosen for these purposes shall be the minimum reasonably required and which will involve the least disturbance to vegetation.
- No trees or shrubs will be felled or damaged for the purpose of obtaining firewood. Fires will only be allowed in facilities or equipment specially constructed for this purpose and only in areas demarcated for that purpose.
- Adequate firefighting equipment must be available at all areas that might pose a fire risk.
- Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner/tenant/persons lawfully living in the vicinity shall be kept to a minimum.
- Chemical toilet facilities or other approved toilet facilities should be sited in such a way that they do
  not cause water or other pollution. The use of existing facilities must take place in consultation with
  the owners of the facilities.
- In cases where facilities are linked to existing sewerage structures, all necessary regulatory requirements concerning construction and maintenance should be adhered to.
- Any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and treated prior to discharge or removed from the site for appropriate disposal.
- Adequate facilities waste receptacles should be made available for waste collection on site prior to removal for disposal at an authorised waste disposal facility on site.
- Adequate storage facilities should be available for materials. The nature of the storage facilities should be as per the recommendations of the manufacturer. The storage areas shall be securely secured and appropriately marked to indicate the goods in the storage.
- Provisions shall be made for the storage of hazardous substances and stocks. Diesel and oil, etc. shall be stored in areas with impervious flooring such as concrete and properly bunded. Drip pans, a thin concrete slab or other impervious surfaces shall be installed in such storage areas with a view to prevent soil and water pollution.

Time Schedule for Implementation: At start-up and throughout life of mine.

#### 6. ACCESS ROADS ON THE SITE

- The access road to the area and the camp-site/site office must be established in consultation with the landowner/tenant and existing roads shall be used as far as practicable.
- Should a portion of the access road be newly constructed, the route shall be selected that a minimum number of bushes or trees are felled and existing fence lines shall be followed as far as possible. Adequate drainage and erosion protection shall be provided where necessary.

- The erection of gates in fence lines and the open or closed status of gates in new and existing
  positions shall be clarified in consultation with the landowner/tenant and maintained throughout the
  operational period.
- No other routes will be used by vehicles or personnel for the purpose of gaining access to the site
  except designated areas only.
- In the case of dual or multiple uses of access roads by other users, arrangements for multiple
  responsibilities must be made with the other users. If not, the maintenance of access roads will be the
  responsibility of the mine/quarry operator.
- Traffic controls/signage should be installed as appropriate, particularly in advance of temporary route changes or deviations and alternatives should be provided as necessary to maintain required access.
- Movement of heavy earth moving machinery should be restricted to certain access roads.
- Access roads shall be adequately maintained so as to minimise dust, erosion or undue surface damage. Spraying with water or use of dust suppressants shall be done as is necessary.

Time Schedule for Implementation: At start-up and throughout life of mine.

#### 7. MANAGING SOCIAL IMPACT RELATED ISSUES

- Effective two-way public disclosure and public consultation should be implemented to allay community
  perceptions. There should be an opportunity provided for the resolution of grievances or complaints
  received and recorded from individuals in the community.
- Community should be adequately informed in advance of activities being done at the mining area that are likely to affect them.
- Labour recruitment should occur in a manner that is objective, transparent, and wherever possible, provide opportunities for people from the local area.
- The activities of the mine/quarry operators and company employees should be routinely reviewed to ensure good community relations are being maintained. The project proponent should use its influence as employer to encourage responsible behaviour among employees.
- The landowner should be fully compensated prior to usage of his land for mining and he should be notified when operations commence and who will work on the site.
- An agreement should be made with the land owner that he is satisfied with the level of rehabilitation on completion of the mining.

#### 8. SPECIFIC MITIGATION MEASURES FOR ENVIRONMENTAL IMPACTS AND RISKS

#### **8.1 MANAGING SOIL IMPACTS**

These measures are targeted at managing soil erosion, soil contamination, compaction of soil and removal of topsoil.

- The area that is stripped of vegetation should be kept to an absolute minimum
- The contractor shall at all times carefully consider what machinery is appropriate to the task while minimising the extent of environmental damage and unnecessary movements should be prohibited.
- The topsoil, including the existing grass cover is to be shallowly ripped (only the depth of the topsoil) before
  removal. This is to ensure that organic plant material, and the natural seed base is included in the stripping
  process. The soil is to be stored and the soil stockpiles shall not be higher than 2m.
- Topsoil shall be stored separately from subsoil and other overburden material.
- No vehicles shall be allowed access onto the stockpiles after they have been placed.
- Stockpiles shall not be allowed to become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation.
- The mine/quarry operator shall apply soil conservation measures to the stockpiles to prevent erosion.
- Ensure regular maintenance of equipment to prevent diesel and hydraulic spillages.
- Where possible ensure low work surface gradients so that run-off flows at a controlled rate so as to minimize channelling and soil erosion during high rainfall.
- At the end of operations, all disturbed areas shall be re-vegetated.

#### TIMING: At Start – up and throughout the operational phase of the mine/quarry

#### 8.2 LOSS OF VEGETATION AND HABITAT DESTRUCTION

- Clearance of vegetation should be restricted to the absolute minimum required to facilitate access and undertake quarry activities. Disturbance of topsoil and vegetation rootstock must be minimized as far as possible.
- Trees larger than 2m should not be removed unless it is absolutely necessary and cannot be avoided.
- No protected species must be removed without a permit. A final walkthrough must be done by an ecologist to
  ensure that the areas where vegetation is to be cleared do not have protected species.
- Any alien species identified should be cleared.
- Burning of any waste material is not permitted under any circumstances.
- Rehabilitation strategies following operational activities must ensure that appropriate indigenous plant species
  are used and should be done as per rehabilitation plan.

#### TIMING: At Start – up and throughout the operational phase of the quarry mine

#### **8.3 DUST AND VEHICLE FUMES**

- Avoid unnecessary excessive vehicle movement.
- Limit vehicle speeds on unsurfaced roads.
- Rehabilitate disturbed areas with vegetation as soon as operation is completed.
- Maintain equipment and vehicles in good working order to avoid excessive emissions.
- Mine/quarry working floors should be sprayed with water from time to time to reduce dust emission during operations

- The use of rubber curtains/other material to limit dust during screening should be considered.
- Spray roads, material stockpiles and screening areas with water if dust becomes problematic.
- No fires should be allowed on site.

#### **TIMING: Throughout life of mine**

#### 8.4 BLASTING IMPACTS (if done)

- All blasting and handling of blasting materials should be done in accordance with the Explosives Act and the Mine Health and Safety Act
- A risk assessment has to be undertaken that takes into account the safety of the people, infrastructure and the surrounding environment. A pre and post blasting survey should be done.
- A blasting time schedule shall be distributed to all surrounding villages indicating the time and date for blasting activities. It is recommended that blasting takes place between 1200hrs and 1500hrs.
- At all times blasting shall be carried out in such a way that ground vibration, air blast and scatter are kept
  within such limits as to avoid damage to adjacent structures/machinery etc. already placed at the works. Any
  fly rock should be cleared after blasting.

#### TIMING: As and when blasting occurs

#### **8.5 WASTE DISPOSAL**

- All personnel must be instructed to dispose of waste in a proper manner.
- Suitable receptacles shall be available at all times and conveniently placed for the disposal of waste.
- No waste shall under any circumstance be disposed of in the veld. No burning of waste is permitted on site
  and the mining area should be protected from illegal dumping of waste.
- All used oils, grease or hydraulic fluids shall be placed in appropriate impervious containers and these
  receptacles will be removed from the site on a regular basis for disposal at a registered or licensed disposal
  facility or sent for recycling/reuse with a registered facility.
- Spills should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing thereof at a recognised facility. In areas where the spills are small, an appropriate absorbent agent can be used and the area treated accordingly.
- Contaminated materials and residues from machinery maintenance and other sources contaminated with hazardous waste should be stored in proper containers that avoid seepage to the ground.
- The 'reduce, reuse, recycle' waste management philosophy will be used where possible.
- Only authorized registered waste disposal contractors should be hired for collection of waste for all waste streams

#### TIMING: At Start – up and throughout the operational phase of the mine/quarry

#### **8.6 STABILITY OF EXCAVATIONS**

- Excavations shall take place only within the approved demarcated mine area and appropriate barriers should be put as necessary.
- The appointed contractor/operator shall ensure that a place of work, whether temporary or permanent in or near the excavation has a structure and solidity appropriate to its use and is operated, supervised and maintained, so as to withstand the environmental forces anticipated and be safe.
- The mine/quarry operator shall ensure that material is not placed or stacked near the edge of any excavation,

where it is likely to endanger people at work and equipment or where it is likely to cause collapse of the side of the excavation.

- Excavations should be routinely inspected. If cracks occur in any structure they need to be investigated to ascertain if there is a risk to safety
- Overburden rocks and coarse material shall be placed concurrently in the excavations or stored adjacent to the excavation, if practicable, to be used as backfill material once the quarry has been excavated.
- Appropriate drainage provisions must be constructed as necessary to accommodate the surface water movement. If the water table is reached during excavations appropriate pumping facilities should be provided.
- Excavated areas should be kept in a safe and stable manner. No unstable block should be present. Reshaping of the mining area may need to be done to ensure that this objective is reached. The profiling should be done to match the surrounding landscape.
- The mine/quarry should be finished in such a manner that it is self-draining as far as is possible
- Top soil should be put back on the surfaces and the areas re-vegetated.

#### TIMING: During operational phase, closure and post closure of the quarry mine

#### **8.7 VISUAL IMPACTS**

- The excavated area must serve as a final depositing area for the placement of overburden. Rocks and coarse material removed from the excavation must be backfilled into the excavation.
- Once excavation parts that can be filled have been refilled with overburden, rocks and coarse natural
  materials, the quarry shall be profiled with acceptable contours and erosion control measures, the topsoil
  previously stored shall be returned to its original depth over the area. The profiling shall be done to match the
  surrounding landscape as far as is reasonable possible.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, then there may be need for the soil to be analysed and any deleterious effects on the soil arising from the mine area, be corrected and the area be seeded with a suitable vegetation seed mix.

#### TIMING: At Start –up and throughout the whole life of the mine/quarry

#### 8.8 EQUIPMENT USED ON SITE

- Only well-maintained vehicles and equipment should be operated onsite and all machinery should be serviced regularly during the mine operation to limit operational impacts as a result of spillage, emissions and noise.
- The maintenance of vehicles and some equipment used for any purpose during the mine operation will take place only in the maintenance workshops which are not located on the mine/quarry. No vehicle may be extensively repaired in any place at the quarry. The exception is only to allow the machinery to be moved in the event of a breakdown for further repairs outside the mine/quarry.
- A maintenance schedule should be prepared in order to ensure that equipment is in is best form so as to not cause unnecessary pollution such as noise, emissions and makes effective use of energy.
- Machinery or equipment used on the mine area must not constitute a pollution hazard. No equipment leaking
  oil should be used. Drip tray should be used to prevent pollution

#### TIMING: At Start – up and throughout the operational phase of the mine/guarry

#### 8.9 NOISE

- Work activities required outside normal working hours must be approved by the Project Manager, and where necessary, advance warning provided to adjacent residents.
- Noise levels exceeding 85dB shall only be permitted where approved and with appropriate advanced warning to adjacent residents (minimum of 2 days) being provided.
- Noise that could cause a major disturbance should only be carried out during daylight hours and with advance warning provided as above.
- Adequate ear protection should be provided to employees in noisy areas
- No amplified music shall be allowed at the site.
- Construction vehicles and plant to be in good working order.

#### TIMING: At Start – up and throughout the operational phase of the mine/quarry

#### 8.10 SAFETY AND SECURITY RISKS

- The mine/quarry should be fenced off and adequate beacons put in place. Entry to the mine area shall be controlled and unauthorised entry prohibited.
- Adequate precautions shall be taken to protect persons present at, or in the vicinity of, the mine/quarry from risks that may arise from the operation
- Adequate signage should be put in place regarding safety and to warn the public it is a mine.
- The appointed mine operator should be held liable for damage to farm/community infrastructure that can be linked to workers.
- The appointed contractor/ mine operator should have a code of conduct governing activities of workers during
  the work at the mine and ensure that all workers are informed of the conditions, specifically trespassing on
  adjacent farms/plots.
- Workers are only to use designated access roads for movement of materials from or to site.
- Safety rules, such as the application of speed limits in particularly, restriction of heavy vehicle movements to specific access roads should be in place.
- There should be procedures for managing and storing waste on site that may pose a threat to livestock if ingested e.g. plastics.
- There should be a mechanism to inform police of theft that occur on site.

#### TIMING: At Start – up and throughout the operational phase of the mine

#### 8.11 ALTERED TOPOGRAPHY IMPACTS

- Mining techniques used should try to avoid the creation of steep slopes.
- On completion of mining, proper profiling should be made and profiling shall be done to match the surrounding landscape as far as is reasonable possible.
- Slopes on finishing off the mine should be gentle to ensure slope stability and the easy re-establishment of vegetation.
- Appropriate drainage provisions must be constructed as necessary to accommodate the free surface water movement.
- On completion all slopes and disturbed areas are to be re-top soiled and re-vegetated in order to prevent erosion, improve aesthetics and regenerate the biodiversity of the site.

#### TIMING: During the operational and closing phase.

#### 8.12 DEALING WITH EMERGENCIES

- The mine operator should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spill.
- Contact details of all departments/service providers to be contacted in case of an emergency shall be made available to employees.
- Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc. shall be made available and personnel properly trained in its use.
- All the emergency equipment should be serviced, repaired and maintained as per supplier's specification or as per engineering specification to ensure that the equipment is in order. Service certificates should be kept on site and be available on inspection.
- All staff on site should be trained on how to handle emergency situations and emergency drills/ rehearsals should be conducted periodically to ensure that staff are prepared. The training shall be recorded.

TIMING: Whenever an emergency occurs during the operational and closing phase.

#### **APPENDIX 5.5: ASSESSMENT OF IMPACTS AFTER MITIGATION MEASURES**

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	_	icance g after ation
	START-UP ACTIVITIES								
1	Site establishment	Loss of vegetation	Neg	2	4	1	3	21	Low
	activities, vegetation	Habitat destruction	Neg	2	4	1	3	21	Low
	stripping	Visual scarring	Neg	2	3	2	3	21	Low
		Air quality deterioration	Neg	2	2	2	3	18	Low
		Soil erosion	Neg	2	2	2	3	18	Low
		Potential loss of	Neg	1	6	2	2	18	Low
		agricultural potential							
		Safety and security	Neg	2	2	1	1	5	Low
2	Soil stripping and	Dust	Neg	2	4	2	2	16	Low
	stockpiling	Disruption of drainage	Neg	3	2	1	2	12	Low
	DURING OPERATIONAL PHA	ASE							
3	Clearance of area for	Visual impact	Neg	2	4	1	3	21	Low
	mining	Destruction of flora and	Neg	2	4	1	3	21	Low
		habitat							
		Loss of agricultural	Neg	1	7	1	2	18	Low
		potential							
4	Dolerite excavation	Dust emissions	Neg	1	4	2	2	14	Low
		Drainage disruption	Neg	3	2	1	3	24	Low
		Slope instability	Neg	2	3	1	1	6	Low
		Noise	Neg	1	2	1	3	12	Low
		Visual Scarring	Neg	2	3	2	3	21	Low
		Altered topography	Neg	2	4	2	3	24	Low
		Soil erosion	Neg	2	1	2	3	15	Low
5	Drilling & blasting (if done)	Noise and vibrations	Neg	1	4	1	1	6	Low
		Air quality deterioration	Neg	1	3	1	1	5	Low
6	Stockpiles	Dust	Neg	1	2	1	2	8	Low
		Surface disturbances	Neg	1	2	1	2	8	Low
		Drainage disruption	Neg	1	2	1	2	8	Low
7	Material handling, hauling	Dust	Neg	2	2	1	3	15	Low
	and transportation	Increased risk of accidents	Neg	1	2	1	3	12	Low
		Noise	Neg	1	2	1	3	12	Low
		Soil contamination from	Neg	1	2	1	3	12	Low
		oil/fuel leaks							
8	Waste Disposal and	Soil contamination	Neg	1	2	1	3	12	Low
	Material storage	Water pollution	Neg	1	2	1	3	12	Low

	Activity	Impact	Positive /Negative	Duration	Magnitude	Extent	Probability	_	icance g after ation
		Increased risk of fire	Neg	1	2	1	3	12	Low
	DURING CLOSURE AND PO	DURING CLOSURE AND POST CLOSURE							
9	Decommissioning of site	Noise	Neg	1	2	1	2	8	Low
	and shaping of quarry	Air quality deterioration (dust)	Neg	1	2	1	2	8	Low
		Soil contamination from oil/fuel	Neg	1	2	1	2	8	Low
		Disruption of surface drainage	Neg	1	2	1	2	8	Low
	SOCIO ECONOMIC IMPACT	S							
10	Negative socio-economic	Community conflicts and	Neg	1	2	2	2	10	Low
	impacts	tensions							
		Increased risk of fire	Neg	1	2	1	2	8	Low
		Reduced security in area	Neg	1	2	1	2	8	Low
11	Positive socio economic	Employment opportunities	Pos	2	2	2	3	18	Low
	impacts	Training and Skills	Pos	2	2	2	3	18	Low
		Development							
	HERITAGE RESOURCES IMP	ACTS							
11	Heritage impacts	Potential impacts	Neg	5	1	1	1	7	Low
		associated with site of a							
		cultural or archaeological							
		importance							
	CUMULATIVE IMPACTS								
12	Use of mine	Increased loss of vegetation	Neg	2	4	1	2	14	Low

#### **APPENDIX 5.6: ASSESSMENT OF NO-GO ALTERNATIVE**

The no-go alternative means that no development will take place on the site. This means that current impacts that are on site as a result of previous activities will continue to occur.

Activity			Duration	Magnitude	Extent	Probability	Signifi	cance Rating
NO GO ALTERNATIVE								
Leaving area as is.	Visual Scarring	Neg	2	4	2	4	32	Medium
	Drainage disruption	Neg	3	2	2	2	14	Low

## **APPENDIX 6**

**SPECIALISTS STUDIES** 

### **HERITAGE STUDY**

# Phase 1 Heritage Impact Assessment of a proposed new borrow pit near Ladybrand, FS Province.



Report prepared by Paleo Field Services PO Box 38806 Langenhovenpark 9330

August 2021

#### Summary

A Phase 1 Heritage Impact Assessment was carried out over a 5.5 ha - area designated for the development of a new borrow pit near Ladybrand in the Free State Province. The study area covers 5.5 ha of uneven, rocky terrain situated at the northern edge of the Platberg, which is an extensive table-topped summit located immediately south of the Ladybrand CBD. The footprint is located within the outcrop area of the Late Triassic – Early Jurassic Elliot Formation of the Stormberg Group (uppermost Karoo Supergroup). The Elliot Formation represents the penultimate phase of Karoo sedimentation and is characterized by its fluvially derived red bed deposits that respectively overlies and underlies the Molteno and Clarens Formations. The site is located on sloping terrain that is partially intruded by a small, localized dolerite flow. Palaeontologically, the the proposed borrow pit site is located in a potential outcrop area of the Euskelosaurus and Massospondylus Range Zones. It is important to note that fossils are rarely uniformly distributed within the fine- to medium-grained sandstone beds and subordinate mudstones of the Elliot and conformably overlying Clarens Formation. Even if operational activities are restricted to the proposed dolerite outcrop it remains highly likely that vertebrate fossil remains (or ichnofossils such as dinosaur footprints) might be affected or destroyed during the course of removing dolerite material at the site. Platberg is a prominent feature of the local geological landscape. It is recommended that the bedrock palaeontological component at the site is assigned a site rating of Local Significance 3A. Proposed development at the site is not advised. No aboveground signs of graves or graveyards were observed within the proposed footprint area. Historical buildings or structures older than 60 years are absent from the site. Impact on potential in situ archaeological material, prehistoric structures, historical structures, rock engravings or graves in the affected area is considered unlikely. However, in addition to the well-documented history of the Platberg region, the study area is located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located only about 300 m away on the northern slopes of Platberg. Although there are no tangible evidence of archaeological remains within the confines of the proposed study area, the Platberg is irreplaceable in terms of cultural landscape. It is recommended that the archaeological component of the footprint is assigned a site rating of Local Significance 3A. Proposed development at the site is not advised.

#### Introduction

A Phase 1 Heritage Impact Assessment was carried out over a 5.5 ha - area designated for the development of a new borrow pit near Ladybrand in the Free State Province (Fig. 1 & 2). The extent of the affected areas (over 5000 m²) falls within the requirements for a Heritage Impact Assessment (HIA) as required by Section 38 (Heritage Resources Management) of the South African National Heritage Resources Act (Act No. 25 of 1999). The site visit and subsequent assessment took place during May 2016. The task involved identification of possible archaeological sites or occurrences in the proposed zone, an assessment of their significance, possible impact by the proposed development and recommendations for mitigation where relevant.

#### **Terms of Reference**

- Identify and map possible heritage sites and occurrences using published and database resources;
- Determine and assess the potential impacts of the proposed development on potential heritage resources;
- Recommend mitigation measures to minimize potential impacts associated with the proposed development.

#### **Approach and Methodology**

The heritage significance of the affected area was based on existing field data, database information, published literature, geological maps and aerial photographs. A field assessment, using a Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. The study area is rated according to field rating categories as prescribed by SAHRA (**Table 1**).

#### LOCALITY DATA

Maps: 1:50 000 scale topographical map 2927 AB Ladybrand

1:250 scale geological map 2926 Bloemfontein

Site coordinates (Fig. 2):

- A) 29°13'0.81"S 27°28'21.74"E
- B) 29°13'1.99"S 27°28'35.72"E
- C) 29°13'4.73"S 27°28'35.24"E
- D) 29°13'5.93"S 27°28'28.63"E
- E) 29°13'3.82"S 27°28'21.11"E

The study area covers 5.5 ha of uneven, rocky terrain situated at the northern edge of the Platberg which is an extensive table-topped summit located immediately south of the Ladybrand CBD (Fig. 3).

#### Geology

The footprint is located within the outcrop area of the Late Triassic – Early Jurassic Elliot Formation of the Karoo Supergroup (Theron 1963; Johnson *et al.* 2006) (**Fig. 4**). The Elliot Formation represents the penultimate phase of Karoo sedimentation (Stormberg Group) and is characterized by its fluvially derived red bed deposits that respectively overlies and underlies the Molteno and Clarens Formations. Sedimentation processes were ended with the advent of extensive volcanic eruptions when basaltic lavas of the Drakensberg Formation and the Lebombo Group were deposited during the Jurassic Period (Duncan et al. 2006). The dykes and sills of resistant Jurassic dolerites (*Jd*) are not fossiliferous. It is generally accepted that the red bed deposits of the Elliot Formation are indicative of laterally continuous floodplain mudstones and associated fluvial sandstones (Visser and Botha, 1980; Smith *et al.*1993; Johnson *et al.*, 1996, 2006). Kitching and Raath (1984) subdivided the Elliot Formation

into three lithostratigraphic units (Lower, Middle and Upper Elliot formations), but Bordy *et al.* (2004) recently suggested that the formation can be subdivided into two informal units, namely the Lower Elliot Formation (LEF) and Upper Elliot Formation (UEF), which have distinct lithologies, resulting from two different sedimentological regimes.

#### **BACKGROUND**

#### **Palaeontology**

The proposed borrow pit site is located in an outcrop area of the Early Jurassic *Massospondylus* Range Zone (Kitching and Raath 1984) of the Late Triassic – Early Jurassic Elliot Formation (Visser & Botha 1980; Johnson *et al.* 2006) (**Fig. 5**). The LEF correlates with Kitching and Raath's Lower Elliot Formation, while the new UEF incorporates both the Middle and Upper Elliot formations of these authors. The division also show reasonable correspondence with the biostratigraphic units defined by Kitching and Raath (1984) as the *Euskelosaurus* and *Massospondylus* Range Zones, respectively. The Elliot Formation contains one of richest Late Triassic to Early Jurassic dinosaur faunas of international importance, which include early dinosaurs (*Massospondylus* and *Euskelesaurus*) ornithischians, rare theropods and crocodilomorphs as well as rare amphibians, turtles, fish, advanced mammal-like reptiles and early mammals (Kitching 1979; Kitching & Raath 1984; MacRae, 1999; McCarthy & Rubidge 2005; Reisz *et al.* 2012). Several early dinosaur localities have been found in the vicinity of Ladybrand in the past so the likelihood is high that vertebrate remains and ichnofossils could be encountered during excavation activities in the area (Bordy et al. 2004) **Fig. 6**).

#### **Archaeology**

Dolerite (*Jd*), in the form of dykes and sills are not palaeontologically significant and can be excluded from further consideration in the present palaeontological evaluation. It is however moderately significant from an archaeological point of view as many Stone Age quarry sites ("factory" sites) are found at the foot of dolerite hills where hornfels or other metasedimentary outcrop occur as a result of contact metamorphism following the intrusion of dykes and sills where mudstone occurs. In addition, sandstone caves, hollows and overhangs in the region could also be significant as it may preserve Stone Age archaeological remains in the form of stratified deposits. Stone tools found in the region are mostly made of opalines, but also hornfels, a dark, fine-grained isotropic rock found in the hot-contact zone between the dolerites and shales in the area (Cochrane 2008). Stone Age artefacts are generally common as surface material on the South African central plateau. However, away from localized areas such as cave or riverine sites, the incidence of surface scatters in the region is expected to be low with Stone Age artifacts, usually occurring as contextually derived individual finds.

The archaeological footprint in the area are primarily represented by Stone Age archaeological localities open and cave sites including rock art) and an extensive footprint related to the distribution of Iron Age settlements and early history of Sothospeaking communities along the Caledon River Valley. Previously recorded Stone Age sites in the region are found at Bokpoort, Orange Springs, Leliehoek and Rose Cottage Cave (Thorp and De Ruiter 1997 (Fig. 7). In addition to Later Stone Age levels with European and Iron Age artifacts and rock art, Rose Cottage Cave also has a long cultural sequence incorporating several MSA and LSA industries ranging from ca. 70 ka to around 10 ka ago (Wadley 1992). Rock shelters associated with more recent hunter – gatherer activities are found at Rooikrans, Mauermanshoek, Westbury and Tienfontein. Numerous rock art sites have been recorded in the region, with over 30 farms listed in the Ladybrand district including the famous Tandjiesberg site near Modderpoort (Van Riet Low 1941) (Fig. 8).

A number of Iron Age settlements, which resemble Maggs's Type V settlement pattern in many aspects of their material culture, are found in the Caledon Valley (Maggs 1976) (**Fig. 9**). They appear to date from the 18th century onwards. According to historical accounts, the southward migration of early Sotho- speaking communities led to at least one group reaching the Caledon Valley about the mid- seventeenth century and occupying most of the upper and middle parts of the valley by 1800 AD. A major event to take place among the indigenous tribes of the interior highveld of South Africa before the coming of European settlers was the Difaqane raids and wars. Precipitated by the rise of Shaka's Zulu empire among the coastal Ngunispeaking peoples, territorial expansion resulted in the creation of large-scale refugee communities that were continued and

extended over the whole interior by resident Southern Sotho-speaking peoples who could not resist the advanced military and political system of the Nguni invaders. This led to the the segmentation of the Southern Sotho into numerous antagonistic communities scattered along the Caledon River Valley (Lye 1967, 1972). One group was the Leghoya who in 1810 or 1812, were finally conquered and completely absorbed by the Taung under their chief, Moletsane, with whom they settled at Mequatling (Viervoetberg), to the northwest west of Ladybrand, in 1837. Although the Leghoya were subjects of Moletsane they lived as separate pockets among the Taung and actually retained their own chief. In 1869, by the Treaty of Aliwal North, Moletsane's territory, which had previously been part of Basutoland, was ceded to the Orange Free State, and Moletsane with his Taung and Leghoya followers moved into south Basutoland, between Mafeteng and Mohale's Hoek, where he was granted land by Moshesh.

Nineteenth century developments in the region also centers around Carolus Baatjes, a name first mentioned in the Wesleyan missionary accounts of 1833 when he formed part of the group of Rolong, Griqua, Korana and missionaries from the Boetsap and Platberg on the Vaal mission stations, who set off on an expedition to find a new, safe area in which to settle. Later in 1833 roughly 12000 people, moved from Platberg on the Vaal and Boetsap to the Caledon River Valley area (Schoeman 1989, 1991) and were settled between four Wesleyan Mission station, Thaba Nchu, Platberg, Lishuane and Umpukane. Platberg was the second most important Wesleyan Mission station in what the Missionaries referred to as the Bechuana District, after Thaba Nchu (Schoeman 2003) (Fig. 9). Historical accounts of the middle Caledon Valley indicate that hunter-gatherers survived as communities until the end of the Basuto Wars and the establishment of European farms in 1869. Stow (1905) recorded traditions about the last "Bushmen" inhabitants of the Korannaberg (Mequatling) and the Platberg (Ladybrand).

#### FIELD ASSESSMENT

The site is located on sloping terrain underlain by potentially fossil-rich Elliot Formation bedrock strata that is partially intruded by a small, localized dolerite flow (**Fig. 10 - 12**). No aboveground signs of graves or graveyards were observed within the proposed footprint area. Historical buildings or structures older than 60 years are absent from the site. Impact on potential *in situ* archaeological material, prehistoric structures, historical structures, rock engravings or graves in the affected area is considered unlikely.

#### **IMPACT STATEMENT & RECOMMENDATIONS**

It is important to note that fossils are rarely uniformly distributed within the fine- to medium-grained sandstone beds and subordinate mudstones of the Elliot and conformably overlying Clarens Formation. Even if operational activities are restricted to the proposed dolerite outcrop it remains highly likely that vertebrate fossil remains (or ichnofossils such as dinosaur footprints) might be affected or destroyed during the course of removing dolerite material at the site. Platberg is a prominent feature of the local geological landscape. It is recommended that the bedrock palaeontological component at the site is assigned a site rating of Local Significance 3A (**Table 1**). Proposed development at the site is not advised.

In addition to the well-documented history of the Platberg region, the study area is also located within close proximity of the well-known prehistoric repositories Leliehoek Shelter and Rose Cottage Cave, with the latter being a declared heritage site, located about 300 m away on the northern slope of Platberg (**Fig. 13**). Although there are no tangible evidence of archaeological remains within the confines of the proposed study area, the Platberg is irreplaceable in terms of cultural landscape. It is recommended that the archaeological component of the footprint is assigned a site rating of Local Significance 3A (**Table 1**). Proposed development at the site is not advised.

#### References

Bordy, E.M., Hancox, P.J. and Rubidge, B.S. 2004. Fluvial style variations in the Late Triassic–Early Jurassic Elliot formation, main Karoo Basin, South Africa *Journal of African Earth Sciences 38: 383–400*.

Cochrane, G.W.G. 2008. A Comparison of Middle Stone Age and Later Stone Age Blades from South Africa. *Journal of Field Archaeology* 33 (4) 429-448.

Duncan, A.R. and Marsh, J.S. 2006. *The Karoo Igneous Province*. **In**: M.R. Johnson, *et. al.* (eds). The Geology of South Africa. Geological Society of South Africa.

Humphreys, A.J.B. 1991. On the Distribution and Dating of Bifacial Tanged and Barbed Arrowheads in the Interior of South Africa. *South African Archaeological Bulletin* 46 (153)

Johnson, M.R., Van Vuuren, C.J., Hegenberger, W.F., Key, R., Shoko, U., 1996. Stratigraphy of the Karoo Supergroup in southern Africa: an overview. *Journal of African Earth Sciences* 23(1): 3–15.

Johnson *et al.* 2006. Sedimentary rocks of the Karoo Supergroup. In: M.R. Johnson, et. al. (eds). *The Geology of South Africa*. Geological Society of South Africa.

MacRae, C. 1999. Life Etched in Stone. Fossils of South Africa. The Geological Society of South Africa, Johannesburg.

McCarthy, T. and Rubidge, B.S. 2005. The Story of Earth and Life. Struik Publishers, Cape Town.

Maggs, T O'C 1976. Iron Age Patterns and Sotho History on the Southern Highveld, South Africa.

World Archaeology 7(3) 318-332.

Kitching, J.W and Raath, M.A. 1984. Fossils from the Elliot and Clarens Formations of the Northeastern Cape, Orange Free State and Lesotho, and a suggested biozonation based on tetrapods. *Palaeontologia africana* 25: 111 – 125.

Kitching, J.W. 1979. Preliminary report on a clutch of six dinosaurian eggs from the Upper Triassic Elliot Formation, Northern Ornage Free State. *Palaeontologia Africana* 125: 41 – 45.

Lye, W.F. 1967. The Difagane – the Mfecane in the Southern Sotho area, 1822 – 1824. Journal of African History 8 (1): 107-131.

Lye, W.F. 1972. *The distribution of the Sotho Peoples after the Difaqane*. **In:** L. Thompson (ed.) African Societies in Southern Africa. Heinemann. London. 191 – 206.

Maggs, T. O'C. 1976. Iron Age Patterns and Sotho History on the Southern Highveld: South Africa. World Archaeology 7: 18-332.

Reisz, R. R, Evans, D. C., Roberts, E. M., Sues, H.-D. and Yates, A. M. 2012. Oldest known dinosaurian nesting site and reproductive biology of the Early Jurassic sauropodomorph Massospondylus. Proceedings of the National Academy of Sciences 109: 2428 – 2433.

Schoeman, K. 1989 The Early Days of the Orange Free State. Human & Rousseau. Cape Town.

Schoeman, K. 1991 The Wesleyan Mission in the Orange Free State. Cape Town. Human and Rousseau.

Schoeman, K. 2003 Early White Travellers in the Transgariep 1819 – 1840. Protea Book House. Pretoria.

Smith, R.H.M., Eriksson, P.G., Botha, W.J., 1993. A review of the stratigraphy and sedimentary environments of the Karoo-aged basins of Southern Africa. Journal of African Earth Sciences 16: 143–169.

Stow, G.W. 1905. The Native Races of South Africa. London.

Thorp, C. and De Ruiter, D. 1997. Evidence for Interaction from Recent Hunter-Gatherer Sites in the Caledon Valley. *African Archaeological Review* 14 (4): 231-256.

Van Riet Lowe, C. 1941. *Prehistoric Art in South Africa*. Archaeological Series No. V. Bureau of Archaeology, Dept. of the Interior. Pretoria.

Wadley, L. 1992. Rose Cottage Cave: The Later Stone Age levels with European and Iron Age artefacts. *South African Archaeological Bulletin* 47:8-12.

Walton, J 1981. The South African kapstylhuis and some European counterparts Restorica, no. 10.

Walton, J. 1965. Early Ghoya settlement in the Orange Free State. *Researches of the National Museum, Bloemfontein Memoir 2*.

#### DECLARATION OF INDEPENDENCE

I, Lloyd Rossouw, declare that I act as an independent specialist consultant. I do not have or will not have any financial interest in the undertaking of the activity other than remuneration for work as stipulated in the terms of reference and have no interest in secondary or downstream developments resulting from the authorization of this project.

## **Tables and Figures**

**Table 1.** Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance	Grade 1	_	Conservation; national
(NS)	0.000		site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance	Cua da 2A	U.s.b. staniff	Conservation;
(LS)	Grade 3A	High significance	mitigation not advised
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A  (GP.A)	-	High/medium significance	Mitigation before destruction
Generally Protected B  (GP.B)	-	Medium significance	Recording before destruction
Generally Protected C  (GP.C)	-	Low significance	Destruction

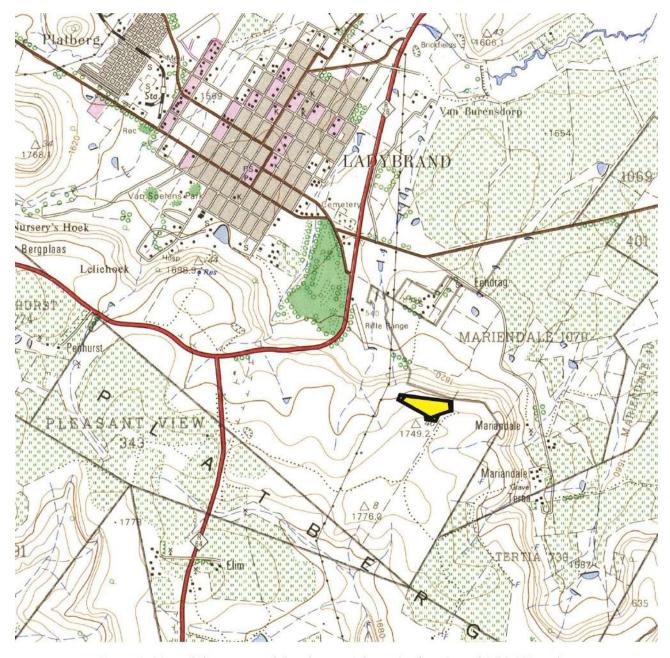


Figure 1. Map of the proposed development footprint (portion of 1:50 000 scale topographic map 2927AB Ladybrand).

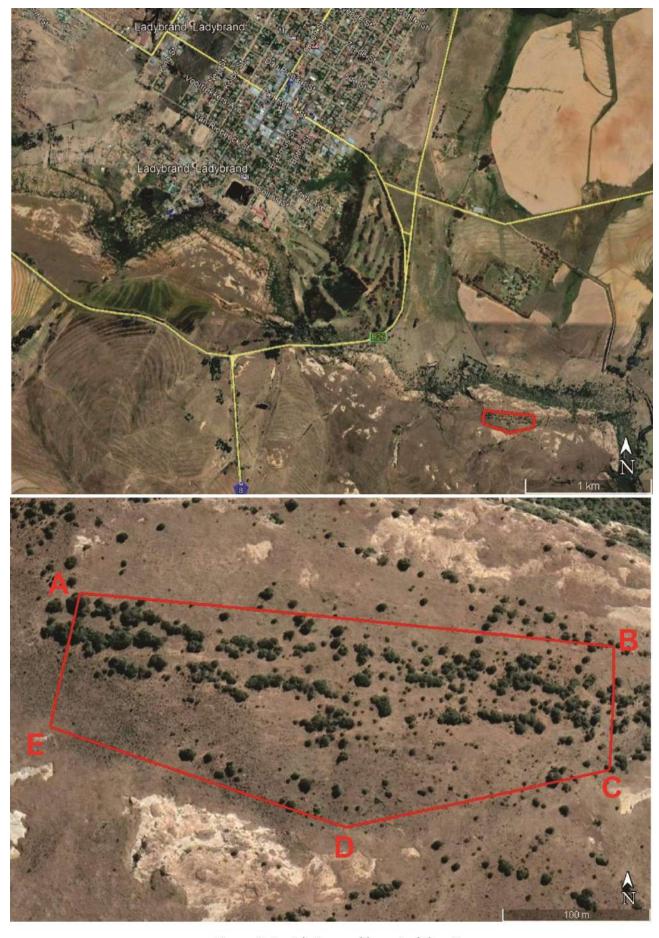


Figure 2. Aerial view and layout of the site.



Figure 3. Standing on degraded dolerite matrix looking north (above). Dolerite intrusion (stippled line) resting on top of Elliot Frm sandstone, looking south (below).

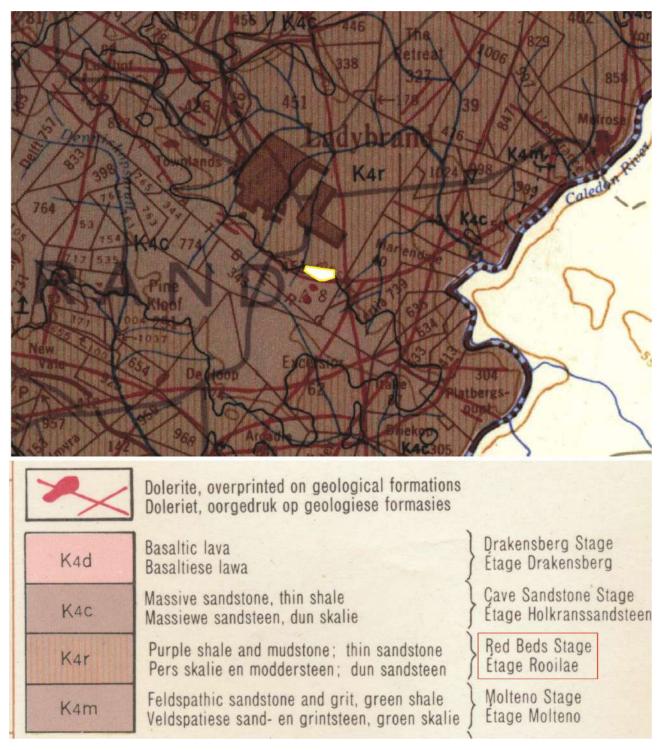


Figure 4. Study area (white polygon) marked on portion of 1:250 000 scale 2926 Bloemfontein. The footprint is located within the outcrop area of the Late Triassic – Early Jurassic Elliot Formation of the Stormberg Group (upper Karoo Supergroup).

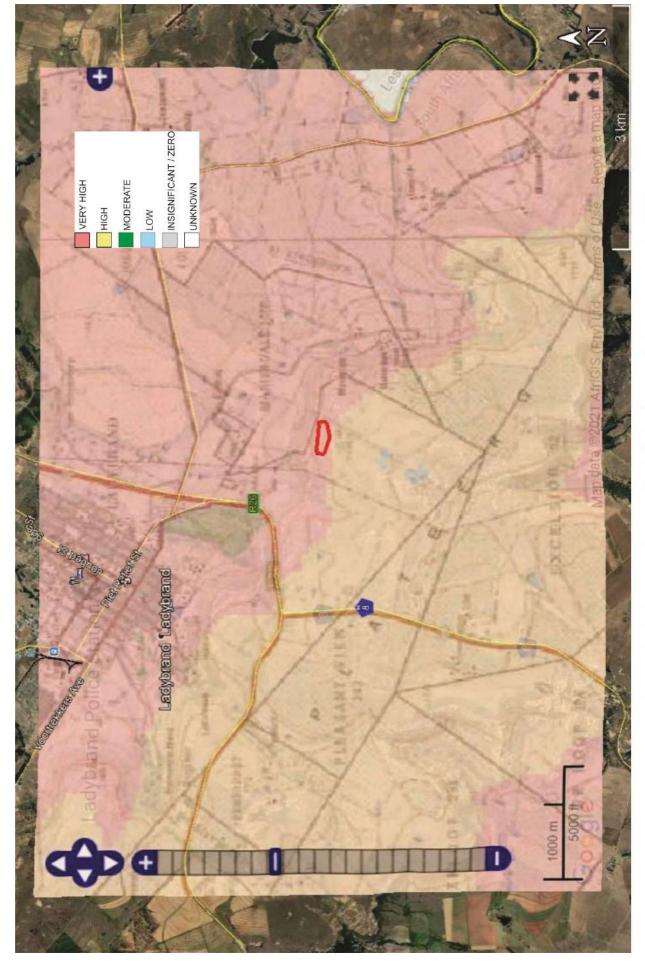


Figure 5. Aerial view of study area with SAHRIS palaeosensitivity map overlay (c. 2021)

Figure 6. Known vertebrate fossil localities recorded in late Triassic-Early Jurassic outcrop near Ladybrand (study area marked by red star).

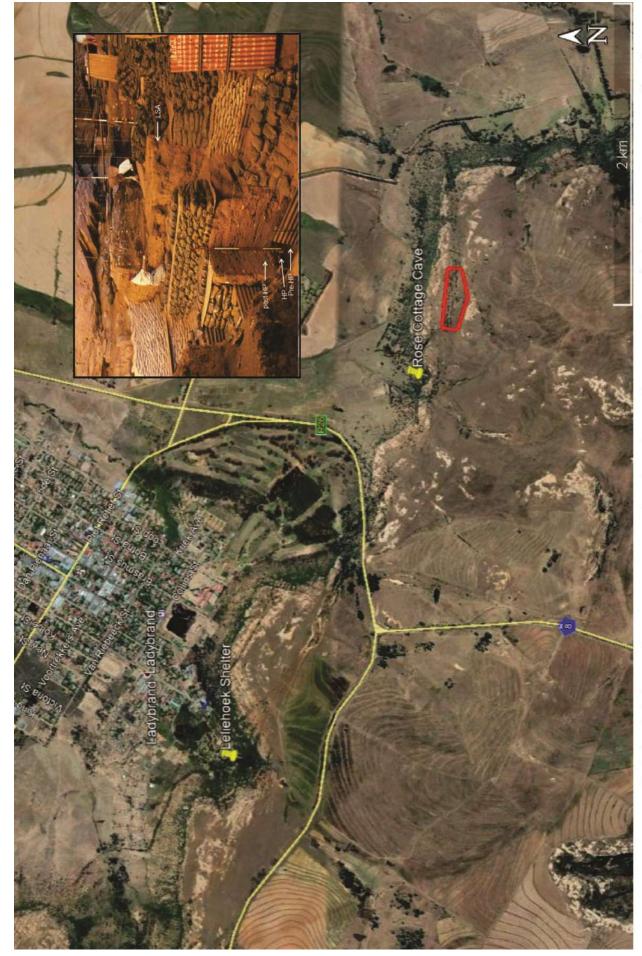


Figure 7. Position of Leliehoek Shelter and Rose Cottage Cave archaeological sites relative to study area (polygon). Excavations at RCC (inset).



Figure . Archaeological and historical sites mentioned in text, including the site of a 19th century Wesleyan Missionary Society station. The photograph below depicts of one of the last recorded South African kapstylhuise found at Platberg (after Walton 1981).

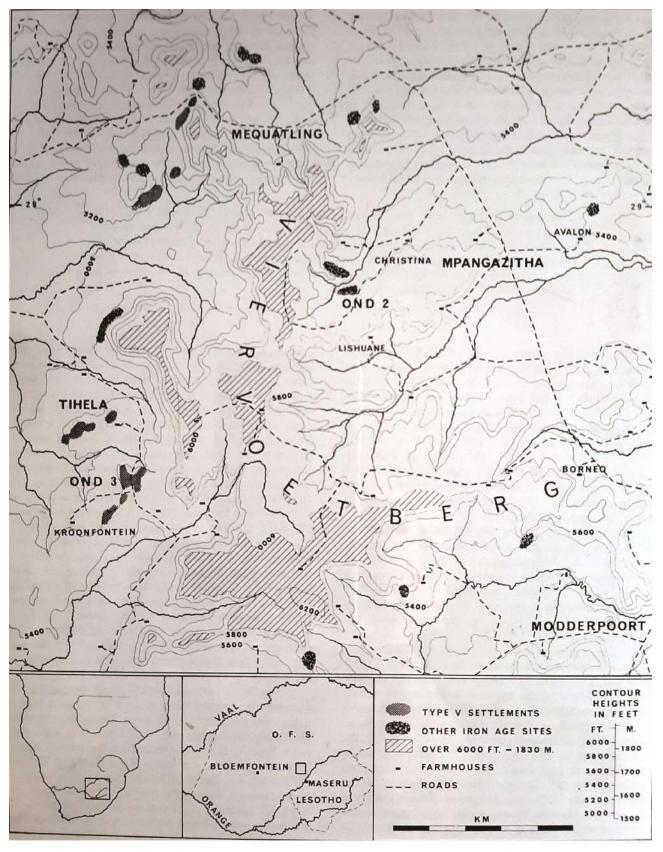


Figure 9. Map of LIA sites recoded around Viervoetberg north of Ladybrand (after Maggs 1976).

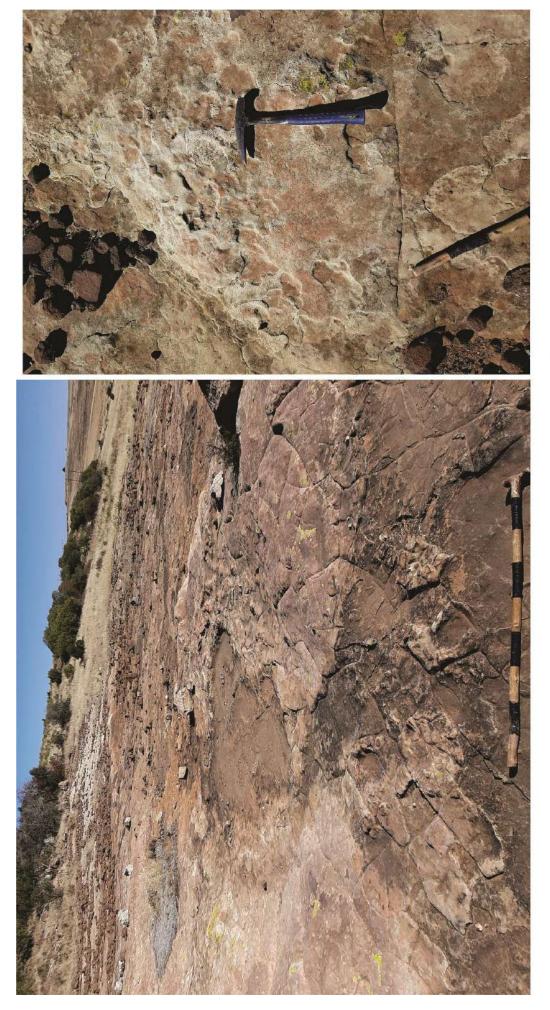


Figure 10. Fractured sandstone surface with flat-floored depressions (left) and smaller micro-weathering features with evidence of flaking along bedding planes (right).

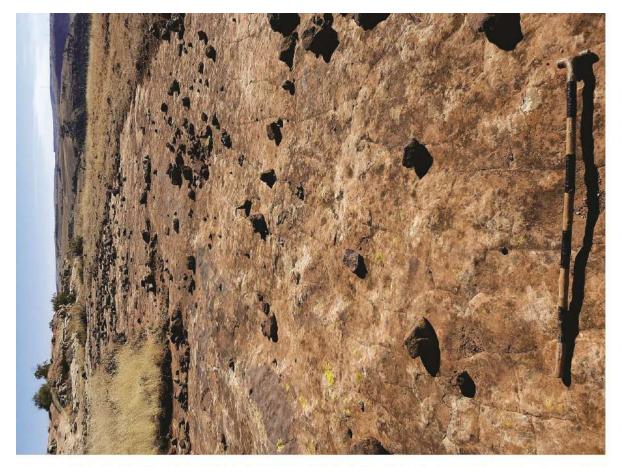




Figure 11. Fine- to medium-grained, sandstone: tabular (left) and horizontally laminated with dessication cracks (right).





Figure 12. Degraded dolerite rubble capping (above and stippled line below) with down-weathered remnants on Elliot Formation sandstone (below). Scale 1 = 10 cm.

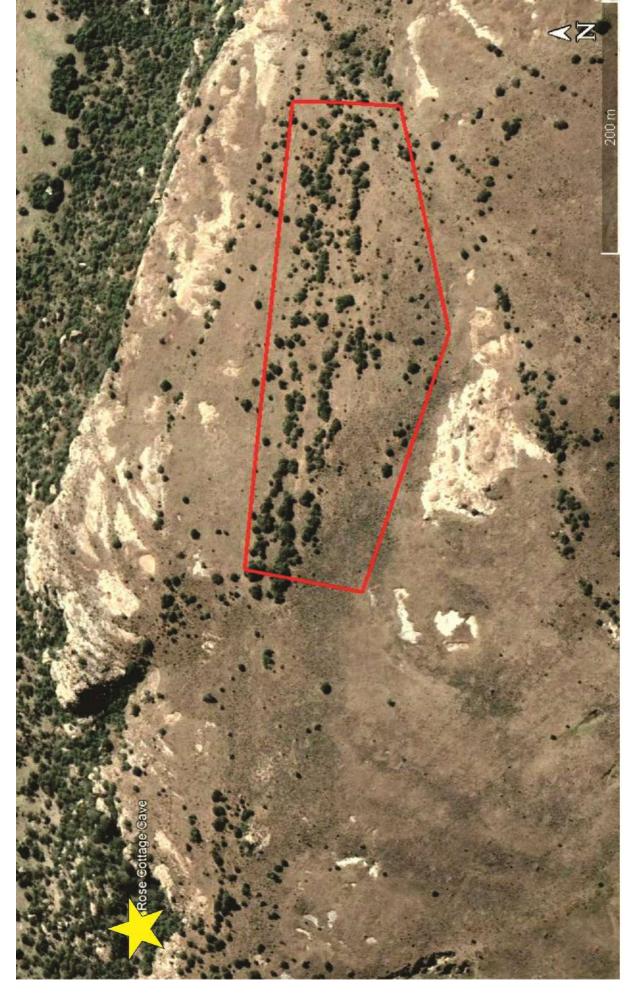


Figure 13. Position of Rose Cottage Cave (star) relative to study area (polygon).

# **ECOLOGICAL STUDY**



Environmental Management Group July 2021

ECOLOGICAL REPORT FOR THE BORROW PIT ON THE RE EXTEND OF 451 DORP GRONDEND LADYBRAND, FREE STATE

Prepared by: Ricus Nel, T- 083 279 5143
E- rnel@envmgp.com
41 Frans Kleynhans, Groenvlei, Bloemfontein

Specialist investigator: Mr R Nel (BSc Honours majoring in Botany (ecology))

Declaration of independence:

I, the above-mentioned specialist investigator responsible for conducting this particular specialist ecological study, declare that

- I consider myself bound to the rules and ethics of the South African Council for Natural Scientific Professions (SACNASP);
- At the time of conducting the study and compiling this report I did not have any interest, hidden or otherwise, in the proposed development, except for financial compensation for work done in a professional capacity;
- Work performed for this study was done in an objective manner. Even if this study
  results in views and findings that are not favourable to the client/applicant, I will
  not be affected in any manner by the outcome of any environmental process of
  which this report may form a part;
- I declare that there are no circumstances that may compromise my objectivity in performing this specialist investigation. I do not necessarily object to or endorse the proposed development, but aim to present facts, findings and recommendations based on relevant professional experience, and scientific data;
- I do not have any influence over decisions made by the governing authorities;
- I have the necessary qualifications and guidance from professional experts (registered Pr. Nat. Sci.) in conducting specialist reports relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity
- This document and all information contained herein are and will remain the
  intellectual property of Environmental Management Group. This document, in its
  entirety or any portion thereof, may not be altered in any manner or form, for any
  purpose without the specific and written consent of the respective specialist
  investigator.

Ricus Nel

To whom it may concern,

Review of specialist ecological assessment:

Of

ECOLOGICAL REPORT FOR the BORROW PIT on the RE EXTEND of 451
DORP GRONDEN LADYBRAND, SE van Rooyen, member and principal
consultant of Environmental Management Group (EMG) and registered professional
scientists in the fields of ecological sciences, evaluated the ecological assessment of
the specialist as mentioned above.

In general, criticism lodged against ecological studies includes poor use of relevant scientific literature, lack of or inadequate field surveys and associated data collection, poor use of regional information datasets, lacking general knowledge of the subject, failure to describe limitations or constraints on survey methodology, insufficient or inadequate data, vague generalisations with no indication of the relative importance of a particular component. Regarding the above criticism, none of it is relevant to the ecological assessment of the aforementioned report. It is concluded that the report complies with the general provincial requirements, and the content as discussed in the report is relevant and concise.

Regards
SE van Rooyen,
Director Managing & Environmental Assessment Practitioner & Ecologist MSc. Cand.Sci.Nat.116554; IAIA Reg No. 5901)

## 1. Executive summary

The proposed site is situated south-east of Ladybrand, Free State province (Figure 1). The site is located within the south-eastern corner of RE451 Dorp Grondend Ladybrand.

The site is situated in the Eastern Free State Sandy grassland type (Gm4) (SANBI, 2018). Gm4 is an endangered vegetation type with approximately 2% of the targeted 24% statutorily conserved in Qwaqwa, Sterkfontein Dam Nature Reserve, and the Golden Gate Highlands National Park (Mucina and Rutherford, 2006; DEA, 2016).

Two homogenous vegetation units were delineated following the survey (Figure 3). VU-A's proximity to the mountain's edge and floral composition is very well described by the Basotho Montane Shrubland type (Gm5) (Vulnerable). Gm5's proximity and affinity to mountain flanks support the previous statement. This unit has experienced very little disturbance, which gives it a higher conservation priority.

VU-B is described as rolling hills of grasses intercepted with numerous sandstone outcrops. VU-B has not experienced any substantial impacts from grazing or any infrastructure development. However, the increased presence of bush encroachment elements such as *Felicia filifolia*, *Chrysocoma ciliata* and especially *Seriphium plumosum* threatens this endangered vegetation type. *Seriphium plumosum* has already transformed some parrts of the surrounding vegetation.

The Free State Biodiversity Map indicated that the site and its surroundings are degraded (Collins, 2015) (Figure 8). This statement was opposed because the area presented various habitats (outcrop plant communities, mountain catchment drains, grassland, and tall shrublands associated with Gm5), relatively low levels of anthropogenic disturbance, numerous protected floras, and is placed within an endangered vegetation type. It was concluded that the site deserves a higher conservation consideration. Therefore, the report regards the area as having a moderate conservation priority.

A biodiversity sensitivity rating was conducted to evaluate the current ecological condition and the site's sensitivity to development. The BSR evaluation concluded that the habitat is in good condition; therefore, development is not preferred on this site.

An impact assessment was performed, which concluded that the mining would have a moderate impact on the environment. Adequate mitigation measures and the recommendations listed in this report will lower the environmental impact caused by the borrow pit.

## Contents

1.	Exe	ecuti	ve summary	. 3
2.	Intr	odu	ction:	. 6
3.	Sco	оре а	and limitations of the study:	. 7
;	3.1.	Veg	getation:	. 7
;	3.2.	Fau	ına:	. 7
,	3.3.	Lim	itations:	. 7
4.	Me	thod	lology:	. 7
4	4.1.	Lite	rature used for additional information:	. 7
4	4.2.	Sur	vey:	. 8
4	4.3.	Ass	essment criteria:	. 8
	4.3	.1.	Vegetation characteristics:	. 8
	4.3	.2.	Vegetation condition:	. 9
	4.3	.3.	Faunal characteristics:	11
4	4.4.	Bio	diversity sensitivity rating (BSR):	12
5.	Stu	ıdy a	ırea:	13
į	5.1.	Reg	gional vegetation:	13
6.	Re	sults	E	14
(	6.1.	Floi	ral survey:	15
(	6.2.	VU-	-A:	16
(	6.3.	VU-	-B:	17
(	6.4.	Floi	ral survey conclusion:	17
(	6.5.	Fau	ınal overview:	19
(	6.6.	Bio	diversity sensitivity rating:	20
	6.6	.1.	Habitat diversity and species richness:	20
	6.6	.2.	Rare and endangered species:	20
	6.6	.3.	Ecological function:	21
	6.6	.4.	Conservation value:	21
	6.6	.5.	Percentage ground cover:	
	6.6	.6.	Vegetation structure:	21
	6.6	.7.	Infestation of exotic and invasive plants:	21
	6.6	.8.	Impact of grazing/ browsing:	
	6.6	.9.	Erosion:	21
	6.6	.10.	Rare and endangered faunal species:	22
7.	Ant	ticipa	ated impacts:	22

7.1.	Concerned ecological aspects:	22
8. Red	commendations:	24
9. Dis	cussion and conclusion:	25
10. R	eferences:	27
11. A	ppendices	29
11.1.	Appendix 1: Impact assessment evaluation form	29
11.2.	Appendix 2	31
11.	2.1. Appendix 2A: Impact significance on the environment	31
11.	2.2. Appendix 2B: Post mitigation impact significance	32
11.3.	Appendix 3: Species list	33
11.4.	Appendix 4: Maps	35
11.1.	Appendix 5: Pictures	36

#### 2. Introduction:

Ecological infrastructure refers to the natural functioning ecosystems which provide essential services to people. The ecosystem functions as a collective of components, living and non-living, interacting with one another (Wohlitz, 2016). Humans benefit from healthy functioning ecosystems in the utilisation of the services they provide. Ecosystem services include provisioning services (food, raw materials, freshwater), regulating services (climate and air quality, carbon sequestration, water purification), supporting services (habitats and genetic diversity), and cultural services (recreation, tourism and spiritual) (Costanza et al., 1997; Fy et al., 2015; Wohlits, 2016). Ecosystems can only provide these services as long as they are in a healthy state. Habitat fragmentation, pollution, erosion and unsustainable harvest are only a few anthropogenic activities threatening healthy ecosystems. These anthropogenic activities destabilise ecosystems and will ultimately result in an ecological breakdown. Poorly functioning ecosystems cannot provide these ecosystem services, which ultimately raise the costs of living.

In terms of biological diversity, South Africa ranks third globally with a high level of endemism (found only in South Africa) (Hoveka et al., 2020). Because of this, South Africa's vegetation is highly localised and experiences a greater threat of extinction. Thus, it is our responsibility to protect South Africa's rich biodiversity.

Despite the seeming homogeneity and low diversity of vegetation, an area may contain endangered and rare species. The presence of these red data species may make the development unfeasible at that specific location. If this occurs, the project should be moved to an alternative location or cease immediately.

Development is a necessity, especially for a developing country such as South Africa. New developments create job opportunities, increase capital growth, and overall create a better country. However, these developments should not come at the cost of pristine ecosystems as they produce invaluable services humans reap for free. For this reason, sustainable development practices should balance the need for development and the conservation of natural resources (Wohlitz, 2016).

The proposed site is situated approximately 3km south-east of Ladybrand central at Lat: 29°13'4.00 "S; Long: 27°28'28.40 "E. The site is somewhat isolated from most infrastructure development. There is no road connecting the proposed borrow pit area to the nearest road (N8).

For the reasons mentioned above, it is necessary to conduct an ecological assessment to assess the possible environmental impacts generated by the development. The recommendations and mitigation measures mentioned in this report should be used to minimise the impact of the proposed development on the environment.

The proposed site is situated approximately 3km south-east of Ladybrand central at Lat: 29°13'4.00 "S; Long: 27°28'28.40 "E. The site is well isolated from any substantial

infrastructure development. There is no road connecting the proposed borrow pit area to the nearest road (N8).

## 3. Scope and limitations of the study:

- Evaluating the present ecological functioning of the area within which the proposed development will take place.
- Identifying and assessing possible environmental impacts that the proposed development could generate.

#### 3.1. Vegetation:

Vegetation related topics to be investigated include:

- The vegetation type within which the proposed development lies and the importance thereof.
- Assessing the overall ecosystem health in terms of its vegetation with emphasis on the level of disturbance (grazing- and anthropological impacts).
- Identification of the area's species composition with emphasis on dominant-, rare-, endangered- and protected species

#### 3.2. Fauna:

Fauna related topics to be investigated include:

- A survey primarily concerned with visual observations of species and supporting evidence of their presence in a given region, such as burrows, excavations, animal tracks, dung, etc.
- A species list including both observed and probable species occurrence.

#### 3.3. Limitations:

- Not all plants have the same flowering period, and thus it is likely that the survey could have occurred outside of the flowering period of a specific species.
- Some geophytic and succulent plants might have been overlooked due to their cryptic nature.
- For most species, especially grasses, inflorescences are vital for accurate identification. Due to the overgrazed state of the proposed site, identification of grass species was difficult.
- Some animal species exhibit a nocturnal and or shy habit and will most likely not be observed during the daytime.

## 4. Methodology:

#### 4.1. Literature used for additional information:

Vegetation:

- Red Data List (Raymondo et al. 2009)
- Vegetation types (Mucina and Rutherford 2006; SANBI, 2006-2018)

• Field guides used for species identification (van Wyk and Malan, 1998; Botha, 2001; van Tooyen et al., 2001; van Wyk and van Wyk, 2013; van Oudtshoorn, 2014; Manning, 2019)

#### Terrestrial fauna:

• Field guides for species identification (Marais, 2004; Sinclair and Ryan, 2010)

#### 4.2. Survey:

Before visiting the site, a desktop study commenced where the following information was determined:

- Vegetation type.
- Climatic conditions.
- Probable rare- endemic- and protected species lists.
- Various homogenous vegetation units in which surveying will commence.
- Probable environmental impacts of the proposed development.

The survey was performed through transects. Plant species observed were recorded with particular emphasis on rare-, endemic-, protected- and dominant species. Attention was given to the current state of the environment regarding grazing impacts, anthropogenic disturbances, erosion and the presence of alien or invasive species. Animal species observed were taken note of, as well as the probability of other animal species' presence (dung, habitat requirements, excavations, animal tracks, burrows, and nests)

#### 4.3. Assessment criteria:

Several assessment criteria were used to determine the overall status of the environment.

#### *4.3.1. Vegetation characteristics:*

The current state of the vegetation in terms of its species diversity, habitats sensitivity, and importance of the ecosystem.

#### **Habitat diversity:**

Greater species richness is usually promoted by an area with greater diversity in habitats that species can occupy.

Table 1 habitat diversity evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
High species richness with many fulfilled niches	(1)
Variety of species occupying a few niches	(2)
Few or a single species dominating an area	(3)

### Rare and endangered floral species:

The presence or potential presence of a rare or endangered species on the site presents an ever-important role in the feasibility of the development.

Table 2 rare- and endangered floral species evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Presence of or high likelihood of presence	(1)
Possible occurrence	(2)
Presence is highly unlikely	(3)

## **Ecological function:**

Each ecosystem functions as an interconnected unit part of the greater system. Removing to many or critical units can result in an entire ecological breakdown of an area. However, the ecological importance of various areas can differ considerably.

Table 3 ecological function evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Critical ecological function as part of the greater system	(1)
Moderate ecological function	(2)
No special ecological function (greater system will not fail if absent)	(3)

#### **Conservation value:**

The conservation value of an ecosystem is influenced by its natural/pristine condition, rehabilitation costs, and importance to the larger system's functioning.

Table 4 conservation value evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Natural/ pristine condition (very valuable)	(1)
Fair to good condition i.t.o. its natural condition	(2)
Heavily transformed, degraded and not rare	(3)

#### 4.3.2. Vegetation condition:

Comparison to an objectively good/ natural condition ecosystem. Veld management practices such as fire regime and grazing intensity can have a significant influence on vegetation condition.

#### Percentage ground cover:

Ground cover is influenced by climate and biophysical conditions such as overgrazing, frequent fires, anthropogenic activities.

Table 5 percentage ground cover evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Good ground cover	(1)
Moderate ground cover (few patches of exposed soil)	(2)
Very poor ground cover (large areas of barren soil)	(3)

#### **Vegetation structure:**

A comparison between of various vegetation layers, i.e. the ratio between the top (trees/ tall shrubs), middle (shrubs) and lower (herbaceous/dwarf shrub) layers.

Table 6 vegetation structure evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
All layers present with their various age classes	(1)
Lower layer slightly grazed while top layer unaffected	(2)
A mono layer dominating an area (presence of degradation notable)	(3)

#### Infestation of exotic and invasive plants:

Exotic/ alien species are those that are not native to South Africa, while invasive species are those that adversely affect the environment.

Table 7 Infestation of exotic and invasive plant species evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
No or a small presence of alien/invasive species	(1)
Moderate infestation by one or more alien/invasive species	(2)
Area with a very high presence of many alien/invasive species	(3)

#### Impact of grazing/ browsing:

The overall vegetation structure and vegetation condition is heavily influenced by the intensity of grazing and browsing.

Table 8 impact of grazing/ browsing evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Very little or no signs of grazing/browsing	(1)
Some signs of grazing/browsing (browse lines, shrubs/trees with signs of	
browsing and grass with signs of grazing)	
Very clear browse level in trees, shrubs heavily pruned and grass layer	
heavily grazed.	

#### **Erosion**:

Signs of erosion is an indicator of environmental disturbance. The severity of erosion usually increases with a lack of ground cover.

Table 9 erosion evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
No or very little signs of erosion	(1)
Small erosion gullies or the presence of slight sheet erosion	(2)
High degree of gully erosion and/ or high degree of sheet erosion	(3)

#### 4.3.3. Faunal characteristics:

## Rare and endangered species:

The presence or potential presence of a rare or endangered species on the site presents an ever-important role in the feasibility of the development.

Table 10 rare and endangered faunal species evaluation score sheet. Refer to table 11 for the overall BSR evaluation.

Criteria:	Score
Presence of or high likelihood of presence	(1)
Possible occurrence	(2)
Presence is highly unlikely	(3)

## 4.4. Biodiversity sensitivity rating (BSR):

The summed scores for the environmental assessment criteria indicated above were used to determine the biodiversity sensitivity for the site. The BSR score is set at a maximum of 30 which strongly favours development's incentive, while a lower score closer to 0 indicates an ecosystem more valuable left undeveloped.

Table 11 biodiversity sensitivity rating evaluation

BSR	Environmental description according	BSR score class
	to the BSR	
Ideal for development	The vegetation has been totally transformed or is in a highly degraded state. The area can no longer be regarded as being in a natural condition. The area generally consists of a very low species diversity, does not contain any species of concern and is heavily populated by invasive plants. This area has lost its inherent ecological function. The area has no conservation value, and rehabilitation potential is outweighed by the costs. This site is ideal for the proposed development.	29-30
Preferred for development	The vegetation is in an advanced degraded state, has a low species diversity and is reasonably populated by invasive species. The area's ecological function is severely affected, and it has inadequate conservation potential. The potential for successful rehabilitation is relatively low. The area is preferred for the proposed development.	26-28
Acceptable for development	Vegetation displays moderate levels of degradation and exhibits a medium level of species richness. No species of concern are present. The degree of infestation is controllable. The area's ecological function is still intact and may be affected by the proposed development's activities. Rehabilitation is possible and should be considered. The area's conservation value is regarded as low. The area is acceptable for development.	21-25
Not preferred for development	The area is in overall good condition. There are some indications of environmental disturbance. Species diversity is reasonably high, and species of concern may be present. The area's ecological function is intact, and minimal rehabilitation efforts are needed. The area is of medium conservation value. The area is not preferred for development.	11-20
Very sensitive not suitable for development	The area is in a pristine or near pristine condition with very few indications of disturbance. The area exhibits a very high species diversity along with several species of concern. The ecological function is very well intact, and the conservation value is very high. The area is susceptible and should be avoided for the proposed development.	0-10

## 5. Study area:

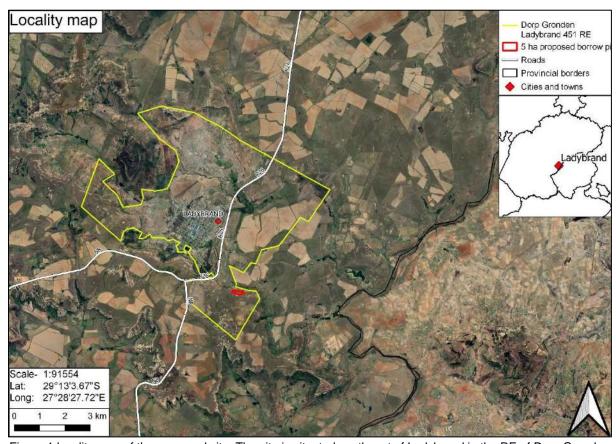


Figure 1 locality map of the proposed site. The site is situated southeast of Ladybrand in the RE of Dorp Gronden Ladybrand.

The proposed site is situated south-east of Ladybrand, Free State province (Figure 1). The site is located within the south-eastern corner of RE451 Dorp Grondend Ladybrand. The site cannot be accessed by any roads. Access to the site can only be obtained by turning off the N8 on municipal farm ground and then off-roading to the site. The site is listed as degraded according to the Free State Biodiversity Plan (Collins, 2015).

#### 5.1. Regional vegetation:

The proposed 5ha borrow pit is situated within the Mesic Highveld Grassland bioregion (Gm). Gm is found primarily in the eastern highveld regions of South Africa (Mucina and Rutherford, 2006). Shrublands are especially common on shallow rocky outcrops where the geology creates arid habitat conditions. These xeric conditions are promoted by the shallow soils limiting water absorption (Mucina and Rutherford, 2006).

The site is situated in the Eastern Free State Sandy grassland type (Gm4) (SANBI, 2018). Gm4 is primarily found in the eastern regions of the Free State province, Lesotho and some minor regions, KwaZulu-Natal. Gm4 is mostly distributed between 1520-1800m a.s.l. however, in some areas, it can be found near 2020m a.s.l.

The Eastern Free State Sandy grassland's general topography is flat to slightly undulating plains with streams and rivers that drain the Drakensberg foothills (Mucina

and Rutherford, 2006). Gm4 is associated with a closed grassland consisting of *Eragrostis curvula*, *Tristachya leucothrix* and *Themeda triandra*. Other dominant grasses include *E. capensis*, *E. racemosa*, *Cymbopogon pospischilii*, *Elionurus muticus*, *Eragrostis plana* and *Aristida junciformis*. Gm4 also has an impressive account of daisies (Asteraceae), especially from the Genus *Helichrysum*, *Vernonia*, and *Berkheya*. Gm4 contain mudstones, sandstone and shale of the Beaufort Group, Tarkastad sub-group in the south and Adelaide sub-group in the north. Outcrops consisting of Glenrosa, Bonheim, Avalon, and Mayo soil form hosts Basotho Montane Shrubland (Gm5) vegetation. Gm4 falls within the summer-rainfall region with a mean annual precipitation of approximately 700 mm.

Gm4 is an endangered vegetation type with approximately 2% of the targeted 24% statutorily conserved in Qwaqwa, Sterkfontein Dam Nature Reserve, and the Golden Gate Highlands National Park (Mucina and Rutherford, 2006; DEA, 2016).

#### 6. Results:

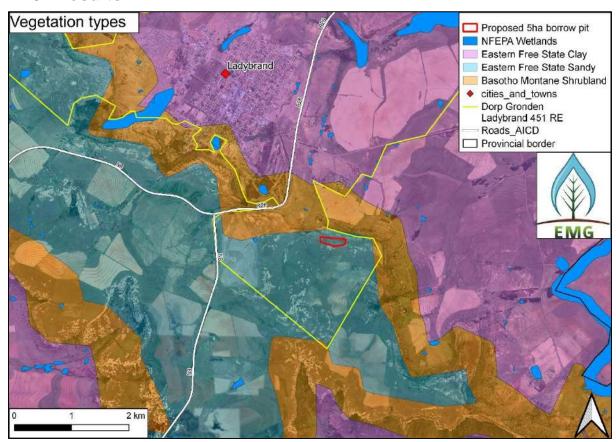


Figure 2 vegetation type map indicating the site's locality within the Eastern Free State Sandy type (Gm4). The Mohokare River is depicted as an NFEPA wetland (Right side of map) bordering Lesotho to its East.

A comprehensive species list is available in appendix 3.

#### 6.1. Floral survey:

The floral survey resulted in the delineation of two major homogeneous vegetation units (VUs) (Figure 3). These units will be described in the following heading. The underlying geology has affinities to the Eliot and Clarens formation from the Karoo Supergroup. The surrounding soils may be characterised as fine-grained sandstone and siltstone associated with the Clarens formation and red, green, grey mudstone and subordinate sandstone associated with the Elliot formation. Numerous sandstone and dolerite outcrops extrude through the surrounding topography, creating a sensitive habitat occupied by a diverse assemblage of xeric flora. These outcrops become more prominent closer to the mountain edge.

The presence of deep, extensively long gullies indicates that the site and its immediate surroundings are erosion-prone (Figure 6, 8). The numerous outcrops present a hardened surface which impedes the absorption of water. Thus causing increased water runoff which is accelerated by steep slopes. Over time the fast-flowing has eroded much of the topsoil, forming these extensively long gullies.

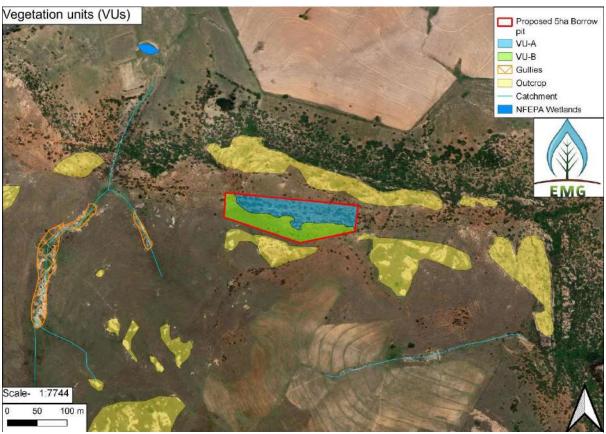


Figure 3 map indicating the two homogenous vegetation units. The numerous Sandstone outcrops are depicted on this map and should be regarded as sensitive habitats (Yellow). Mountain catchment drain lines are depicted in blue along with the NFEPA wetlands

#### 6.2. VU-A:

This unit is physiognomically described as a dense, medium to tall shrub stand growing closest to the mountain edge. VU-A's dense shrublike community consists of the following dominant species: Diospyros lycoides, D. whyteana, Euclea crispa, Searsia erosa, S. lancea, and Olea europaea subsp. africana. Other shrubs frequently recorded were Searsia Heteromorpha burchellii, arborescens Rhamnus prinoides and Osyris lanceolata. The herbaceous layer is not well developed due to the closed canopy created by a dense stand of shrubs. The herbaceous layer prominent becomes more clearings where more sunlight penetrates the lower strata. In these clearings and around the periphery of VU-B, the grass layer is represented by a few pioneering to sub-climax grasses such as Aristida congesta, Melinis repens,



Figure 4 view of *Aloe grandidentata* flowering in the clearings between tall shrubs. The scattered distribution of *F. filifolia* can also be seen. Tall *S. lancea, and S. erosa* are growing in the background.

Hyparrhenia hirta and Eragrostis lehmanniana. Felicia filifolia and Chrysocoma ciliata have a scattered distribution amongst the grasses in clearings. The periphery of VU-B sees the presence of exotic weeds such as Tagetes minuta and Bidens bipinnata. The dense shrub community situated at the mountain's edge is strongly associated with the Basotho Montane Shrubland (Gm5) (Vulnerable). Gm5's proximity to VU-A supports the previous statement. Protected species found within this unit are Aloe grandidentata, Cussonia paniculate, and Olea europaea subsp. africana (DESTEA, 1969).

#### 6.3. VU-B:

VU-B primarily is represented by a broken grassland intercepted small sandstone intrusions. A wide array of sub-climax to climax grasses dominate the layer. herbaceous These include Themeda triandra, Sporobolus fimbriatus, Cymbopogon pospischilii, Hyparrhenia hirta, Eragrostis chloromelas and Eragrostis lehmanniana. Sheet erosion becomes more prominent closer to sandstone outcrops. Aristida congesta



Figure 5 view of VU-B. Notable bush encroachment by *S. plumosum* Dense tall shrubs of VU-A depicted in the background.

and Aristida diffusa thinly populate these eroded patches.

The grassy hills are being utilised as a communal grazing area. Several heaps of cattle dung represent evidence hereof. The intact herbaceous layer and sparsely scattered dung heaps suggest that the area experiences low to moderate grazing levels.

A notable observation is the increased presence *Seriphium plumosum and Felicia filifolia*. In some areas, the entire veld has been transformed from a grassy hill to rough textured shrubland consisting almost entirely of *Seriphium plumosum*. *S. plumosum* is a known bush encroachment element and has caused considerable habitat transformation across much of the eastern Free State. Bush encroachment has caused significant habitat degradation in this unit. *S. plumosum* avoids the shallow soils associated with the Sandstone outcrops. *Aloe grandidentata*, *Brunsvigia cf. radulosa*, and *Helichrysum subglomeratum* are provincially protected species found in this unit (DESTEA, 1969).

## 6.4. Floral survey conclusion:

The site is situated in the Eastern Free State Sandy Grassland type (Gm4) (SANBI, 2018) (Figure 2). The Sandy Grassland is an endangered vegetation type that is very poorly conserved. Only 2% of the targeted 24% is formally conserved (Mucina and Rutherford, 2006). The Free State Biodiversity Map indicated that the site and its surroundings are degraded (Collins, 2015) (Figure 8). Large areas south and west of the proposed site have been transformed for dry crop cultivation and may be considered degraded in an ecological view (Figure 7). However, the vast majority of the area has experienced very little disturbance and remains largely intact. Therefore the site cannot be regarded as degraded.

Erosion is prevalent and represented by deep gullies formed in the valleys of undulating hills. Therefore the area is prone to erosion and should be regarded as sensitive. The plateau acts as a rain catchment area that concentrates rainwater into numerous small water channels down the mountain. These water channels will only transport water during and immediately after precipitation events. The access road connecting the proposed borrow pit with the N8 should be designed and planned to exert the least amount of disturbance on these water channels.

Two homogenous vegetation units were delineated during the survey (Figure 3). VU-A's proximity to the mountain's edge and floral composition is very well described by the Basotho Montane Shrubland type (Gm5) (Vulnerable). Gm5's proximity and affinity to mountain flanks support the previous statement. This unit has experienced very little disturbance, which gives it a higher conservation priority.

VU-B is described as rolling hills of grasses intercepted with numerous sandstone outcrops. VU-B has not experienced any substantial impacts from grazing or any infrastructure development. However, the increased presence of bush encroachment elements such as *Felicia filifolia*, *Chrysocoma ciliata* and especially *Seriphium plumosum* threatens this endangered vegetation type. *Seriphium plumosum* has already transformed a large extent of the surrounding vegetation.

The sandstone outcrops host numerous xeric adapted flora, which is unique in respect to the surrounding grassland. At first glance, the outcrops would seem barren; however, in slight depressions where weathered sandstone accumulates, a relatively diverse community of xeric flora thrive. Numerous succulents such as *Ruschia hamata*, *Chasmatophyllum musculinum*, *Delosperma lavisiae*, *Aloe grandidentata*, *Cotyledon orbiculata*, and *Crassula nudicaulis* occupy microhabitats formed by depressions in the outcrop and shade formed by other flora and rocks. These outcrop communities may even host several cryptic species which were overlooked during the survey. The outcrops create a unique arid habitat amongst a mesic grassland occupied by many xeric adapted flora. Therefore it should be regarded as unique and sensitive. It is recommended that both the access road and mining avoid these sandstone outcrops.

The many provincially protected species (DESTEA, 1969), low to moderate levels of disturbance, sensitive sandstone outcrop plant communities and the site's placement in an endangered vegetation type (Mucina and Rutherford, 2006; DEA, 2016; SANBI, 2018) considerably increases the site's conservation value. It is suggested that the site has a moderate to high conservation value.

#### 6.5. Faunal overview:

The site had few signs of mammalian life. Although a comprehensive mammal survey was not conducted, signs and tracks of animals were recorded. Indications of mammalian life are represented by a few small burrows most likely occupied by *Cynictis penicillate* (Yellow mongoose) since a few individuals of this species were observed in the surrounding area. *Lepus saxitalis* (Scrub hare) was observed on several occasions. Scattered small piles of dung resembling that of the subfamily Antilopinae were observed. These piles were most likely left by *Sylvicapra grimmia* (common duiker). Dung resembling that of a domestic dog was found in the area. Locals stated that they occasionally go rabbiting using their dogs. The natural occurring fauna are generalists and will most likely self-relocate once the disturbance levels rise.

The proposed borrow pit will transform a relatively small area of the site's vegetation and habitat for fauna. It is possible that some faunal species were overlooked due to exhibiting a shy nature, nocturnal habit or burrowing habit. A large extent of the mountain plateau is currently being and have been cultivated in the past. The land use transformation for crop cultivation has most likely been the cause for the low faunal diversity. Seeing that no prominent water source is located on-site, the occurrence probability of red-data megafauna is relatively low. The site has moderate connectivity to other open systems, allowing animals to migrate away from any substantial disturbance. The site's connectivity to opens systems reaffirms the statement that crop cultivation has caused the low faunal diversity.

A reptile and mammal search on the Virtual Museum portal resulted in only one red data mammal species for QDS 2927AB (FitzPatrick Institute of African Ornithology, 2021). Otomys auratus (Southern African Vlei rat) might be present on site. This species is near threatened and deserves a high conservation priority. The absence of any substantial watercourses lowers the probability of its occurrence; however, it might still be present in the area. Therefore, should any species of conservation concern be observed during mining, all disturbance activities should halt until a suitably qualified biologist is contracted and the appropriate mitigation measures are performed.

### 6.6. Biodiversity sensitivity rating:

The site has experienced little anthropogenic disturbance. Some areas have been transformed for dry crop cultivation; however, much of the natural habitat remains intact. The site is regarded to have a good ecological function and has moderate conservation value. The natural vegetation has reclaimed areas that have previously been cultivated and moderately represent the surroundings' overall vegetation structure and floral composition. A BSR score of 20 is at the high end of the "Not preferred" category (Table 11).

Table 12 final biodiversity sensitivity rating evaluation.

Vegetation characteristics:	Score (1-3)
Habitat diversity	2
Rare and endangered species	2
Ecological function	2
Conservation value	2
Vegetation condition:	
Percentage ground cover	2
Vegetation structure	2
Infestation of exotic and invasive plants	2
Impact of grazing/ browsing	2
Erosion	2
Faunal characteristics:	
Rare and endangered species	2
BSR total score:	20
Development preference rating	Not preferred

#### 6.6.1. Habitat diversity and species richness:

The site consists of a well-developed herbaceous layer intercepted by numerous sandstone outcrops. These outcrops host a unique assemblage of xeric adapted flora. In addition, a dense stand of tall shrubs (VU-A) is located closer to the mountain edge. The mountain plateau also hosts several small catchments drains which sustains aquatic habitats.

## 6.6.2. Rare and endangered species:

The site survey did not result in the identification of any rare or endangered plant species. There is a medium probability to find such species considering the low to moderate levels of disturbance. Numerous provincially protected species were logged during the survey. Cussonia paniculata (Mountain cabbage tree) and Helichrysum subglomeratum, Aloe grandidentata, Brunsvigia cf. radulosa, and Olea europaea subsp. africana are found on the site. The removal of these species should only take place after the relevant permits are obtained.

#### 6.6.3. Ecological function:

Some areas have previously been cultivated; however, these areas have since been reclaimed by natural vegetation. Large areas of cultivated land are still present in the surrounding area; however, there still exists good connectivity between other open systems. The presence of *Seriphium plumosum* does present a threat to this threatened vegetation type since it is a known bush encroacher. This species has caused significant habitat transformation in Mesic Highveld and Lesotho (Ward, 2009; Avenant, 2015; Hae, 2016).

#### 6.6.4. Conservation value:

The site is situated in Gm4, an endangered vegetation type. The Free State Biodiversity Map (Collins, 2015) indicated that the site is located in a degraded zone. The field survey concluded that the site does not match the characteristics of a degraded habitat and at least deserves a higher conservation consideration. Considering the low levels of disturbance, habitat diversity, and the formal classification within Gm4, the site has a medium conservation value.

#### 6.6.5. Percentage ground cover:

The herbaceous layer is relatively well developed and only absent where outcrops protrude through the landscape.

#### *6.6.6. Vegetation structure:*

The surrounding area has a well-developed herbaceous layer and hosts several dense stands of tall shrubs associated with Gm5 vegetation closer to the mountain edges. There are isolated patches where *Seriphium plumosum* increases; however, these are mainly located close to the mountain edge.

## 6.6.7. Infestation of exotic and invasive plants:

The levels of infestation are relatively low. *Opuntia ficus-indica, Cotoneaster franchetii* and *Pyracantha angustifolia* were the only serious invasive species recorded. These category 1b invasives do not have a wide distribution across the site. Other alien species recorded include Bidens bipinnata, Tagetes minuta and *Pseudognaphalium luteo-album*.

#### 6.6.8. Impact of grazing/browsing:

Few piles of cattle dung suggest that the area does experience some grazing; however, the impacts of grazing were barely noticeable.

#### 6.6.9. Erosion:

The presence of deep, extensively long gullies indicates that the site and its immediate surroundings are erosion-prone (Figure 6). The numerous outcrops present a hardened surface which impedes the absorption of water. Thus causing increased water runoff which is accelerated by steep slopes. Over time the fast-flowing water has eroded much of the topsoil, forming these extensively long gullies. The largest of these gullies formed where two mouintan catchment drains meet. Seeing that erosion

is prevalent in the area it would be advisable that care be taken when planing the layout of the access road.

## 6.6.10. Rare and endangered faunal species:

No rare or endangered faunal species were recorded during the site visit. The probability that *Otomys auratus* occurs on the site is low, given that no wetlands are present near the site. Even with a low probability, there still exists a slight chance of its presence. Workers should be informed about the presence of red data species. Should any such species be observed during mining, the operations should halt until a qualified individual mitigates the situation.

## 7. Anticipated impacts:

This project will result in an overall loss of biodiversity through habitat destruction and reduction of species diversity. The site is situated in Gm4, which is an endangered vegetation type. The site and its surroundings presented numerous different habitats (grasslands, outcrops, shrubland and mountain drainage lines). A rich diversity in different habitats generally produces higher species richness. There were some levels of disturbance recorded on the site and its surroundings. These include land use transformation for cultivation, erosion, and low levels of bush encroachment. Some of these cultivated lands have been reclaimed by natural vegetation. These reclaimed croplands present a similar vegetation structure and floral composition to their immediate surroundings. The site and its surroundings represent a relatively healthy ecosystem and should be regarded as a moderate to low conservation priority. Therefore, the proposed borrow pit will have a moderate environmental impact.

#### 7.1. Concerned ecological aspects:

Habitat loss and or fragmentation is a leading cause of the global biodiversity crisis. The removal of environmental units will lead to the destabilisation of the entire ecosystem and eventually ecological breakdown. The proposed development will result in an overall loss of habitat and have a moderate impact significance.

Table 13 ecological impact on habitat loss for fauna and flora assessed using table 17, appendix 1 and final evaluation form from table 18, appendix 2.

Concerned aspect:	Impact characteristic	Score	Mitigation:
	Geographical extend	1	A qualified ecologist should supervise
	Probability	4	the access road's layout and
	Duration	3	development. The access road should avoid the sandstone outcrops and
Habitat loss	Reversibility	3	mountain catchment drain lines. The
	Cumulative impacts	3	careful planning of the access road will
	Intensity	3	minimise erosion and limit the impact
	TOTAL	42	on sensitive habitats.
Significance rating	Moderate		

Indigenous vegetation has a far greater conservation value to exotic species. Indigenous species have adapted to the surrounding environment and have established many stable networks of energy transfer. The removal of indigenous species disrupts this balance which has formed over many years. The estimated impact on the transformed vegetation will thus be of a moderate degree.

Table 14 the anticipated impact on the loss of indigenous floral and faunal diversity assessed table 17, appendix 1 and final evaluation form from table 18 appendix 2.

Concerned aspect:	Impact characteristic	Score	Mitigation:
	Geographical extend	1	Removal of indigenous flora should be kept
Loss of	Probability	4	at a minimum. Disturbance related activities may only occur in the demarked
indigenous	Duration	3	area. All activities should best avoid
floral and	Reversibility	3	exerting disturbance on the sandstone
faunal	Cumulative impacts	3	outcrops and mountain catchment drains.  Off-road driving should be strictly
diversity	Intensity	3	prohibited. Any fauna that becomes
	TOTAL	42	trapped as a result of the mining related
Significance rating	Moderate		activities may not be harmed and must be rescued and relocated.

Protected species have been assigned protected status either nationally or provincially. These species are of unique conservation concern for many purposes. These include socioeconomic importance, scarcity, limited distribution and ecological significance. Removing these species should be avoided at all costs. If removal is unavoidable, the necessary permits should be acquired for their removal and translocation if possible. Several provincially protected floras were recorded during the survey. These are *Cussonia paniculata* (Mountain cabbage tree), *Helichrysum subglomeratum*, *Aloe grandidentata*, *Brunsvigia cf. radulosa*, and *Aloe europaea subsp. africana*. These species have a relatively broad distribution across South Africa. It should be stressed that the survey did not take place in the flowering season and that it is possible that sensitive/protected floras were missed.

Table 15 the anticipated impact on the loss of protected floral and faunal species, assessed using table 17, appendix 1 and final evaluation form from appendix 2.

Concerned aspect:	Impact characteristic	Score	Mitigation:
	Geographical extend	1	The removal of protected species
Loss of	Probability	4	should be avoided if possible. Removal
protected	Duration	3	of protected species may only occur after the relevant permits are
floral and	Reversibility	3	obtained.
faunal	Cumulative impacts	2	
species	Intensity	3	
	TOTAL	39	
Significance rating	Moderate		

Table 16 overall anticipated environmental impact. See appendix 2B for the mitigated impact significance evaluation.

Concerned aspect	Score	Rating prior to	Score post	Rating with
	prior to	mitigation	mitigation	mitigation
	mitigation			
Habitat loss	42	Moderate	20	Low
Loss of indigenous	42	Moderate	20	Low
floral and faunal				
diversity				
Loss of protected floral	39	Moderate	24	Low
and faunal species				
Overall impact:	41		21	
Significance rating:		Moderate		Low

#### 8. Recommendations:

- A qualified ecologist should supervise the access road's layout. This is to minimise the environmental impact through erosion and removal of sensitive flora.
- All activities should best avoid exerting disturbance on the sandstone outcrops and mountain catchment drains.
- Care should be taken to not unnecessarily clear or destroy indigenous vegetation.
- All areas to be affected by the proposed development should be rehabilitated by indigenous vegetation.
- The mined area should be fenced off, and all disturbance related activities should be restricted to this area.
- The post mined site should be revegetated by strictly using indigenous vegetation. Revegetation should be performed to minimise erosion.
- All stockpiles, construction vehicles, equipment, and machinery should be situated away from the sensitive areas, i.e., sandstone outcrops and catchment drains.
- Removal of protected species should be reconsidered and only occur when absolutely necessary.
- The relevant permits should be obtained before removing *Cussonia* paniculata, *Helichrysum subglomeratum*, *Olea europaea subsp. africana*, *Brunsvigia radulosa*, and *Aloe grandidentata*.
- No structures should be built outside the area demarcated for the development.

- Early signs of erosion derived from the disturbance related activities should be mitigated.
- Adequate monitoring of weed establishment and their continued eradication should be maintained during and after mining.
- The hunting, capturing and trapping of fauna should be prevented throughout the mining operations.
- Training of construction workers to recognise threatened animal species will reduce the probability of fauna being harmed unnecessarily.
- Any fauna that becomes trapped in the trenches or any construction or operational related activity may not be harmed and must be rescued and relocated by an experienced person.
- All construction and maintenance vehicles must stick to properly demarcated and prepared roads. Off-road driving should be strictly prohibited.
- No dumping of any form is permitted.
- All construction-related waste/material should be appropriately disposed of after mining has ceased.

## 9. Discussion and conclusion:

The site is situated in the Eastern Free State Sandy Grassland type (Gm4) (SANBI, 2018) (Figure 2). The Sandy Grassland is an endangered vegetation type that is very poorly conserved. Only 2% of the targeted 24% is formally conserved (Mucina and Rutherford, 2006). The Free State Biodiversity Map indicated that the site and its surroundings are degraded (Collins, 2015) (Figure 8). This statement was opposed because the area presented various habitats (outcrop plant communities, mountain catchment drains, grassland, and tall shrublands associated with Gm5), relatively low levels of anthropogenic disturbance, numerous protected floras, and is placed within an endangered vegetation type. It was concluded that the site deserves a higher conservation consideration. Therefore, the report regards the area as having a moderate conservation priority.

The numerous outcrops present a hardened surface which impedes the absorption of water. Thus, causing increased water runoff which is accelerated by steep slopes. Over time the fast-flowing water has eroded much of the topsoil, forming these extensively long gullies. The largest of these gullies formed where two mountain catchment drains meet. Seeing that erosion is prevalent in the area, it would be advisable that care be taken when planning the layout of the access road.

Removal of provincially protected species should be reconsidered and only occur if absolutely necessary. The relevant permits should be obtained before any protected species is removed.

A biodiversity sensitivity rating was conducted to evaluate the current ecological condition and the site's sensitivity to development. The BSR evaluation concluded that the habitat is in good condition; thus, development is not preferred on this site.

An impact assessment was performed, which concluded that the mining would have a moderate impact on the environment. An impact assessment was performed, which concluded that the mining would have a moderate impact on the environment. Adequate mitigation measures and the recommendations listed in this report will lower the environmental impact caused by the borrow pit.

### 10. References:

Avenant, P., 2015. Report on the national bankrupt bush (*Seriphium plumosum*) survey (2010-2012). *Department of Agriculture, Forestry and Fisheries*. South Africa.

Bromilow, C., 2010. Problem plants and alien weeds of South Africa. Briza Publications CC, Cape Town.

Botha, C.,2001., Common weeds of crops and gardens in southern Africa. Potchefstroom, Suid-Afrika: *ARC-Grain Crops Institute*.

Collins, N.B., 2015. Free State Province Biodiversity Plan: CBA map. Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs. Internal Report.

Costanza, R., d' Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R.V., Paruelo, J., Raskin, R.G., Sutton, P., van den Belt, M., 1997. The value of the world's ecosystem services and natural capital. Nature 387, 253-260.

Department of Environmental Affairs .,2016. National Protected Areas Expansion Strategy for South Africa 2016. Department of Environmental Affairs, Pretoria, South Africa.

Department of economic, small business, development, tourism and environmental affairs., 1969. Free State Nature Conservation Ordinance no 8. Free State, South Africa.

FitzPatrick Institute of African Ornithology .,2021. ReptileMAP Virtual Museum. Accessed at http://vmus.adu.org.za/?vm=ReptileMAP on 2021-07-05

FitzPatrick Institute of African Ornithology., 2021. MammalMAP Virtual Museum. Accessed at http://vmus.adu.org.za/?vm=MammalMAP on 2021-07-05

Fy, B., Zhang, L., Xu, Z., Zhao, Y., Wei, Y., Skinner, D., 2015. Ecosystem services in changing land use. Journal of soils and sediments 15, 833-843.

Hae, M.E., 2016. Invasive plant species in Lesotho's rangelands: species characterization and potential control measures. *United Nations University Land Restoration Training Programme*. Available at https://www.researchgate.net/deref/http%3A%2F%2Fwww.unulrt.is%2Fstatic%2Ffell ows%2Fdocument%2FHae2016.pdf

Manning, J. 2019. Field Guide to Wild Flowers of South Africa. Struik Nature, Cape Town.

Marais, J., 2004. 'n voledige gids tot die slange van Suider-Africa. Struik Publishers, Cape Town.

National Environmental Management: Biodiversity Act., 2016. Alien and invasive species list (Act No 10 of 2004). Government Gazette no 40166 of 29 July 2016.

Raymondo et al., 2009. Red List of South Africa. SANBI Red List. Online. Available at: http://redlist.sanbi.org/. Accessed on June 2021.

Sinclair, I., Ryan, P., 2010. Birds of Africa south of the Sahara. Struik Nature, Cape Town.

South African National Biodiversity Institute., (2006-2018). Vegetation map of South Africa, Lesotho and Swaziland, Mucina L., Rutherford, M.C., Powrie, L.W (Eds), Online, http://bgis.sanbi.org/Projects/Detail/186, Version 2018.

van Oudtshoorn, F. 2014. Guide to grasses of southern Africa. Briza publishers, Pretoria.

van Tooyen, N., Bezuidenhout, H., de Kock, E.,2001. Blomplante van die Kalhariduineveld. South African National Biodiversity Institute, Pretoria.

van Wyk, B. & Malan, S. 1998. Field guide to the wild flowers of the Highveld. Struik Publishers, Cape Town.

van Wyk, B., van Wyk, P., 2013. Field Guide to Trees of Southern Africa. Struik Publishers, Cape Town.

Ward, D., 2009. Do we understand the causes of bush encroachment I African savannas?. *African Journal of Range and Forage Science* 22, 101-105.

Wohlitz, E. 2016. Bring Nature back to the city: How to conduct urban nature conservation. Briza publications, Pretoria.

# 11. Appendices

## 11.1. Appendix 1: Impact assessment evaluation form

Table 17 description of the rating system used to evaluate the possible impacts concerned with the proposed development.

Geographi	ical extend: This describes t	the spatial reach an impact might have.
Score		
1	Site specific	The impacts will only affect the specific site.
2	Local	The impacts will affect the local area or district.
3	Provincial	The impacts will be recognised across most of
		the province.
4	International/ national	Will affect the entire country or other countries.
Probability	y: This describes the probabi	ility that a specific environmental impact will
occur.	•	
1	Unlikely	Less than 25% chance of occurrence.
2	Possible	Between 25-50% chance of occurrence.
3	Most likely	50-75% chance of occurrence.
4	Definite	Greater than 75% chance of occurrence.
Duration:	This describes the amount of	f time an environment will be affected by the
impact.		· · · · · · · · · · · · · · · · · · ·
1	Short term	The impact will disappear very quickly, either
•		through mitigation or through natural
		processes. The impact should have
		disappeared within 1 year.
2	Medium term	The impact will endure for a short while after
		the construction processes and will be
		mitigated by either human intervention or
		natural processes. The impact should have
		disappeared between 2-10 years
3	Long term	The impact will persist through the construction
		phase and disappear by either human
		intervention or natural processes in 10-30
		years.
4	Permanent	Mitigation either by man or natural processes is
		highly unlikely. The impact will have
		permanently affected the environment.
	•	of an impact to be entirely reversed after
developme	nt.	
1	Entirely reversable	The impact is entirely reversible and can be
		achieved with minor mitigation measures.
2	Possibly reversable	The impact might be reversible. Suitable
		mitigation measures will increase the chances
		of reversibility and should be considered.
3	Barely reversible	It is unlikely that the impact will be reversed.
		Extreme mitigation measures might increase
		the chances of successful reversibility.
4	Irreversible	The impact is irreversible. No mitigation
		measures can reverse the effects on the
		environment.

Cumulative	impacts: Describes the	cumulative impacts of the proposed
development,	i.t.o. the development proce	ss and all activities emanating from the
operation of th	e facility.	
1	Very low cumulative impact	The impact will result in no or minimal cumulative effects.
2	Low cumulative impact	The impact will result in an overall low cumulative effect.
3	Moderate cumulative impact	The cumulative impacts will have moderate levels of impact.
4	High cumulative impact	The cumulative impact will result in high to very high environmental effects.
Intensity: Des	cribes the severity of the imp	pact on the environment
1	Low	The impact's effect on the system will be hardly noticeable, if at all. Rehabilitation measures have to be in place if required.
2	Medium	The impact will have a recognisable effect on the environment. However, system functionality will still be present with negligible effects on ecosystem integrity. Rehabilitation measures have to be in place.
3	High	The impact will severely affect ecosystem integrity and function. Rehabilitation will be costly, and extreme mitigation measures have to be in place.
4	Very high	The impact will result in the entire ecological breakdown of the system or components thereof. Rehabilitation will be costly with minimal chances of success. Extreme mitigation measures must be in place.

## 11.2. Appendix 2: Impact significance

## 11.2.1. Appendix 2A: Impact significance on the environment

Impact significance describes the overall environmental impact resulting from the cumulation of impact characteristics. Significance gives a judgement of the effect a development will have on the environment. Significance is calculated as the total score for each criterion (geographical extend + probability + duration + reversibility + cumulative impacts) multiplied by the intensity. A greater significance score results in an overall greater environmental impact and should be avoided or allowed with extreme mitigation measures in place. A lower significance score results in an overall lesser environmental impact and may be allowed with very little or no mitigation measures needed.

Table 18 impact significance evaluation form

Score	Impact significance rating	Description
5-19	Very low	Impact significance is of a
		very low order.
		Development is
		acceptable
20-34	Low	Impact significance is of a
		low order ,and
		development is
		acceptable.
35-49	Moderate	The impact will be
		recognisable and may
		pose a problem to the
		development.
50-64	High	The impact is substantial
		and will significantly affect
		the environment.
		Development is
		unacceptable.
65-80	Very high	The impact is of the
		highest possible order and
		will cause irrefutable
		damage to the
		environment.
		Development
		unacceptable.

## 11.2.2. Appendix 2B: Post mitigation impact significance

Table 19 mitigated impact significance evaluation on habitat loss.

Concerned aspect: (MITIGATED)	Impact characteristic	Score
	Geographical extend	1
	Probability	3
Habitatlana	Duration	2
Habitat loss	Reversibility	2
	Cumulative impacts	2
	Intensity	2
	TOTAL	20
Significance rating	LOW	

Table 20 mitigated impact significance on the loss of indigenous flora and fauna.

Concerned aspect: (MITIGATED)	Impact characteristic	Score
	Geographical extend	1
	Probability	3
	Duration	2
Loss of indigenous floral and faunal diversity	Reversibility	2
	Cumulative impacts	2
	Intensity	2
	TOTAL	20
Significance rating	LOW	

Table 21 mitigated impact significance on the loss of protected fauna and flora.

Concerned aspect: (MITIGATED)	Impact characteristic	Score
	Geographical extend	1
	Probability	3
	Duration	3
Loss of protected floral and faunal species	Reversibility	3
	Cumulative impacts	2
	Intensity	2
	TOTAL	24
Significance rating	LOW	

## 11.3. Appendix 3: Species list

Species indicated with an \* are exotic.

Protected species are coloured orange and Red Listed species red.

Table 22 species logged during the site visit of 02 July 2021.

Family	Species	Invasive category
Aizoaceae	Chasmatophyllum musculinum	
Aizoaceae	Delosperma lavisiae	
Aizoaceae	Ruschia hamata	
Amaryllidaceae	Brunsvigia cf. radulosa	
Anacardiaceae	Searsia burchellii	
Anacardiaceae	Searsia erosa	
Anacardiaceae	Searsia lancea	
Apiaceae	Heteromorpha arborescens	
Araliacae	Cussonia paniculata	
Asphodelaceae	Aloe grandidentata	
Asteraceae	*Pseudognaphalium luteo-album	
Asteraceae	*Tagetes minuta	
Asteraceae	*Bidens bipinnata	
Asteraceae	Berkheya onopordifodia	
Asteraceae	Chrysocoma ciliata	
Asteraceae	Dicoma anomala	
Asteraceae	Felicia filifolia	
Asteraceae	Geigeria burkei	
Asteraceae	Helichrysum subglomeratum	
Asteraceae Asteraceae	Helichrysum subglomeratum Seriphium plumosum	
		(1b)
Asteraceae	Seriphium plumosum	(1b)
Asteraceae Cactaceae	Seriphium plumosum *Opuntia ficus-indica	(1b)
Asteraceae Cactaceae Celastraceae	Seriphium plumosum *Opuntia ficus-indica Gymnosporia buxifolia	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae	Seriphium plumosum *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae	Seriphium plumosum *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae	Seriphium plumosum *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae	Seriphium plumosum  *Opuntia ficus-indica  Gymnosporia buxifolia  Cotyledon orbiculata  Crassula nudicaulis  Kalanchoe thyrsiflora  Diospyros lycioides	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae	Seriphium plumosum  *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae	Seriphium plumosum  *Opuntia ficus-indica  Gymnosporia buxifolia  Cotyledon orbiculata  Crassula nudicaulis  Kalanchoe thyrsiflora  Diospyros lycioides  Diospyros whyteana  Euclea undulata	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae	Seriphium plumosum  *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana Euclea undulata Indigofera nigromontana	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Fabaceae Malvaceae Myrsinaceae	Seriphium plumosum  *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana Euclea undulata Indigofera nigromontana Melolobium candicans	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Fabaceae Malvaceae	Seriphium plumosum  *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana Euclea undulata Indigofera nigromontana Melolobium candicans Grewia occidentalis Myrsine africana Olea europaea subsp. africana	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Fabaceae Malvaceae Myrsinaceae	*Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana Euclea undulata Indigofera nigromontana Melolobium candicans Grewia occidentalis Myrsine africana	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Fabaceae Malvaceae Myrsinaceae Oleaceae	Seriphium plumosum  *Opuntia ficus-indica Gymnosporia buxifolia Cotyledon orbiculata Crassula nudicaulis Kalanchoe thyrsiflora Diospyros lycioides Diospyros whyteana Euclea undulata Indigofera nigromontana Melolobium candicans Grewia occidentalis Myrsine africana Olea europaea subsp. africana	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Fabaceae Malvaceae Myrsinaceae Oleaceae Plantagniaceae	*Plantago virginica	(1b)
Asteraceae Cactaceae Celastraceae Crassulaceae Crassulaceae Crassulaceae Ebenaceae Ebenaceae Ebenaceae Fabaceae Malvaceae Myrsinaceae Oleaceae Plantagniaceae Poaceae	**Plantago virginica  Seriphium plumosum  **Opuntia ficus-indica  Gymnosporia buxifolia  Cotyledon orbiculata  Crassula nudicaulis  Kalanchoe thyrsiflora  Diospyros lycioides  Diospyros whyteana  Euclea undulata  Indigofera nigromontana  Melolobium candicans  Grewia occidentalis  Myrsine africana  Olea europaea subsp. africana  **Plantago virginica  Aristida congesta	(1b)

Poaceae	Eragrostis echinocloidea	
Poaceae	Eragrostis lehmanniana	
Poaceae	Hyparrhenia hirta	
Poaceae	Melinis repens	
Poaceae	Sporobolus fimbriatus	
Poaceae	Themeda triandra	
Pteridaceae	Cheilanthes eckloniana	
Pteridaceae	Pellaea calomelanos	
Rhamnaceae	Rhamnus prinoides	
Rosaceae	*Cotoneaster franchetii	(1b)
Rosaceae	*Pyracantha angustifolia	(1b)
Rosaceae	Cliffortia linearifolia	
Rubiaceae	Anthospermum rigidum	
Santalaceae	Osyris lanceolata	
Solanaceae	*Solanum lichtensteinii	
Solanaceae	Lycium cinereum	
Thymelaeaceae	Lasiosiphon anthylloides	

## 11.4. Appendix 4: Maps

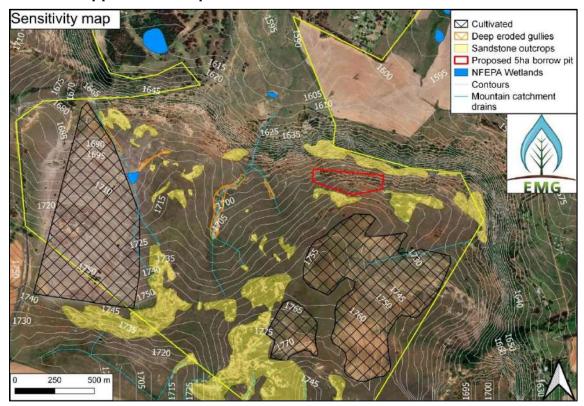


Figure 6 Sensitivity map indicating the vast majority of intact habitat which is intercepted by the scattered sandstone outcrops (Yellow). Fast flowing water down the catchment drains (blue) have caused deep eroded gullies (slanted orange).

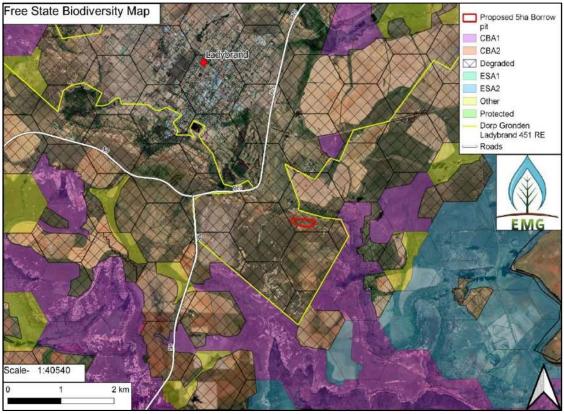


Figure 7 Free State Biodiversity Map indicating the site's locality within a degraded zone (Collins, 2015). The claim that the site is in a degraded zone is contradicted by Fig 6

## 11.1. Appendix 5: Pictures



Figure 8 View of the deep donga approximately 500m from the proposed borrow pit.



Figure 9 Helichrysum subglomeratum



Figure 10 *Brunsvigia cf. radulosa* growing between grasses. This species is difficult to spot as it grows amongst tall grasses.



Figure 11 *Crassula nudicaulis* and *Delosperma lavisiae* growing in very shallow soils. These species can easily be overlooked.



Figure 12 *Cheilanthes eckloniana*, *Pellaea calomelanos* and *Aloe grandidentata* growing in the shallow soils derived from weathered sandstone.

# **FEASIBILITY STUDY**



#### **EARTH INVESTIGATION LABORATORIES**

6 Van Zyl Street
Noordhoek
Kroonstad
P.O. Box 2856, Rosslyn, 0200
Tel: +27 (0)12 372 3023
Fax: +27 (0)86 241 3304
e-mail: admin@earthinv.co.za

TEST REPORT

REPORT # SL 05-27-02

CLIENT INFORMATION							
Client Name:	Environmental Management Group	247					
Address:	41 Frans Kleinhans, Groenvlei,Bloemfontein	Project Name:	Free State Borrow Pit Investigation				
Primary Contact Person:	CW Vermeulen	Telephone Number:	082 824 9308				
Primary Contact email:	cwv@envmgp.com	Fax Number:	051 412 6351				

SAMPLES/JOB INFORMATION						
Date Sampled:	15-Jun-21	15-Jun-21				
Sampler:	Client	Date Tested:	17-Jun-21			
Sample Location:	Borrow Pit - Lady	Date Reported:	25-Jun-21			
Sample Method:	TMH 5 MB 1	Tests Conducted At:	Kroonstad Laboratory			
Sample Condition:	Good	Report Status:	Final			

TEST RESULTS SUMMARY							
Test (s) Methods References	Test Method(s) Description (s)	Qty	Test Conducted by.				
SANS 3001 - GR 1:2013	Wet preparation & particle size analysis	1	Kroonstad Laboratory				
SANS 3001 - GR 10:2013	Determination of the one-point liquid limit, plastic limit, plasticity index & linear shrinkage	1	Kroonstad Laboratory				
SANS 3001 - GR 20:2010	Determination of the MC by oven-drying	1	Kroonstad Laboratory				
SANS 3001 - GR 30:2013	Determination of the max. dry density & opt. MC	1	Kroonstad Laboratory				
SANS 3001 - GR 40:2013	Determination of the CBR	1	Kroonstad Laboratory				
-							
-			-				

#### TEST RESULTS NOTES

Tests Deviations and Subcontracting - Test deviations indicated if any on the report and clearly communicated to Client.

**Documents Reproduction** - If a report is published or reproduced by the client, it will be done in full, without any omittance.

Report Status - Only final status results are to be good for publication.

Samples Received and Results Relation - Test results relate to sample received and to conditions thereof on receipt

Samples Retainment - If not specified by the Client, samples will be disposed off as per the Laboratories discretion

Opinions & Recommendations: Opinions & recommendations do not form part of the Labs accreditation schedule



Page 1 of 2

(FIL)		Earth Inv Lab													
EARTHINVLAB							REPOR' , MDD								
PROJECT:	Free State Borr	ow Pit Investigat	tion			<u>,                                      </u>		<u>, , , , , , , , , , , , , , , , , , , </u>							
REPORT #	SL 05-27-02														
	1944														
SAMPLE #	Lady (2)														
POSITION:															
DEPTH:	0														
DATE:	17-Jun-21														
Description of Material	ı	Dark brown grave	el												
SIEVE ANALYSIS															
SIEVE SIZE (mm)															
100.0	1														
75.0	1	100													
63.0	7	100													
50.0	1	95													
P 37.5	7	73													
A 28.0	7	59													
5 20.0	1	42													
S 14.0	1	37													
5.0	1	24													
N 3.0 2.0	1	19													
0.425	1	15													
0.075	1	6													
Grading Modulus (GM)	1	2.60													
SOIL MOTAR															
2.0 - 0.425		24													
0.425 - 0.250		5													
0.250 - 0.150		2													
0.150 - 0.075		3													
< 0.075		45													
ATTERBERG CONSTANTS															
Plasticity Index (PI)		5													
Linear Shrinkage (LS)		2.7													
Liquid Limit (LL)		35													
HRB Soil Classification		A -1-a 0													
TRH 14 Classification		G6													
COLTO Classification		G6													
MDD DATA															
		MDD	A 140 5 4575	1		М	DD			1 —		MI	DD		
3.	1580 1560 1540 1520 1500 1480 1480	8 10 12 % Moisture content	14 16 18	0.8 0.6 0.4 0.2 0 6	7		9 1		12	0.8 0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0	0.0,	0 , 0 2 % Moistu	3,0	,0	,0 6
Wet Density (kg/m³)	1560 1540 1520 1500 1480 2 4 6 2 2 2 1734 1787	8 10 12 % Moisture content	14.5, 1551 12.6, 1540 15.6, 1520 14 16 18	0.8 0.6 0.4 0.2 0	7				12	0.6 0.4 0.2 0	0.0,				,0 6
Dry Density(kg/m³)	1560 1540 1520 1500 1480 2 2 1734 1787 1540 1575	8 10 12 % Moisture content 1776 1757 1551 1520	14.5.1551 12.6.1550 15.6.1650 14.16.18 1672 1500	0.8 0.6 0.4 0.2 0	7				12	0.6 0.4 0.2 0	0.0;				6
Dry Density(kg/m³) Moisture Content (%)	1560 1540 1520 1500 1480 2 4 6 2 2 2 4 6 2 2 2 1734 1787 1540 1575 12.6 13.5	8 10 12 % Moisture content 1776 1757 1551 1520 14.5 15.6	14.5 1551 12.6 1540 15.6 1620 14.16 18.16 1672 1500 11.5	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	1 0.0,	% Moistu	ire content		,0 6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³)	1560 1540 1520 1500 1480 2 2 1734 1787 1540 1575	8 10 12 % Moisture content 1776 1757 1551 1520	14.5.1551 12.6.1550 15.6.1650 14.16.18 1672 1500	0.8 0.6 0.4 0.2 0	7	% Moistu			12	0.6 0.4 0.2 0	0.0,	% Moistu			,0 6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA	1560 1540 1520 1500 1500 1480 2 4 6 2 4 6 2 5 1734 1787 1540 1575 12.6 13.5	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6  OMC %	14. 1551 12. 1540 15.6. 1620 14. 16. 18 1672 1500 11.5 13.5	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	0.0,	% Moistu	ire content		,0 6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen	1560 1540 1520 1500 1480 1480 1575 12.6 13.5 1575 Specimen A	8 10 12 % Moisture content 1776 1757 1551 1520 14.5 15.6 OMC %	14.5 1551 12.6 1540 14.1 1561 1500 14.1 16.1 18 1672 1500 11.5 13.5	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	1 0.0,	% Moistu	ire content		6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³)	1560 1540 1520 1500 1480 1480 1575 1540 1575 12.6 13.5 1575 Specimen A	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705	14. 1551 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	1 0.0,	% Moistu	ire content		.0 6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³)	1560 1540 1520 1500 1480 1734 1787 1540 1575 12.6 13.5 1575 Specimen A 1784 1576	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498	14. 1551 14. 1551 1500 14. 16. 180 14. 16. 18 1672 1500 11.5 13.5 Specimen C 1597 1409	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	0.0,	% Moistu	ire content		6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%)	1560 1540 1520 1500 1480 1734 1787 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8	14. 1551 1500 14. 16. 180 14. 16. 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	0.0,	% Moistu	ire content		6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated	1734 1787 1540 1550 1550 1550 1550 1550 1575 12.6 13.5 1575 1576 13.2 100.1	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1	141, 1551 120, 1840 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	1 0.0,	% Moistu	ire content		6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR %	1734 1787 1540 1550 1550 1550 1550 1575 12.6 13.5 1575 12.6 13.5 1576 13.2 100.1 43.2	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5	144. 1551 120. 1560 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		12	0.6 0.4 0.2 0	1 0.0.	% Moistu	ire content		, 0 6
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76	0.8 0.6 0.4 0.2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		% Moistur	IC %			0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% Moistu	AC%		
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated Compaction %	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50 100 98	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64 97 95	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76 93 90	0.8 0.6 0.4 0.2 0	7	% Moistu	re content		90	0.6 0.4 0.2 0	98	% Moistu	ire content		90
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated Compaction % CBR Values	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76	0.8 0.6 0.4 0.2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		% Moistur	IC %			0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% Moistu	AC%		
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated Compaction %	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50 100 98	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64 97 95	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76 93 90	0.8 0.6 0.4 0.2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		% Moistur	IC %			0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% Moistu	AC%		
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated Compaction % CBR Values	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50 100 98	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64 97 95	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76 93 90	0.8 0.6 0.4 0.2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		% Moistur	IC %			0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% Moistu	AC%		
Dry Density(kg/m³) Moisture Content (%) MDD (kg/m³) CBR DATA Specimen Wet Density (kg/m³) Dry Density(kg/m³) Moisture Content (%) % Compaction Calculated CBR % % Swell Calculated Compaction % CBR Values	1734 1787 1540 1575 1540 1575 12.6 13.5 1575 Specimen A 1784 1576 13.2 100.1 43.2 0.50 100 98	8 10 12 % Moisture content  1776 1757 1551 1520 14.5 15.6 OMC %  Specimen B 1705 1498 13.8 95.1 26.5 0.64 97 95	144. 1551 126. 1540 1500 14 16 18 1672 1500 11.5 13.5 Specimen C 1597 1409 13.3 89.5 13.2 0.76 93 90	0.8 0.6 0.4 0.2 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		% Moistur	IC %			0.6 0.4 0.2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0		% Moistu	AC%	93	



Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

# Selected Borrow Pits on Municipal Lands

# LICENSING OF GRAVEL BORROW PITS IN THE MANTSOPA LOCAL MUNICIPALITY

Geological Investigation of Ladybrand, Hobhouse, Excelsior and Tweespruit in the Mantsopa

Local Municipality

June 2021



Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

## Introduction

This document aims to list all the findings from the submitted report (*LICENSING OF GRAVEL BORROW PITS IN THE MANTSOPA LOCAL MUNICIPALITY: Geological Investigation of Ladybrand, Hobhouse, Excelsior and Tweespruit in the Mantsopa Local Municipality Version 2)* on the 11<sup>th</sup> May 2021. What follows are the identified and recommended areas in each of the four towns on municipal land, which show preferable properties for the establishment of borrow pits. For a detailed photographic reference please refer to the original report.





Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

## Ladybrand

The following dolerite locations are located on municipal owned land:

Name	Coordinates	Farm Name	Municipal Land (Y/N)				
AREA 1	-29.217332°S	Dorp Gronden Ladybrand	Yes				
AREAT	27.473351°E	451/RE	res				
Expected Material	Distance from	Comments					
Quality	Town	Comments					
Dolerite G5 – G6	11 km	Could be accessed from t	the R26 but a new access road needs to				
Dolente G5 – G6	TTKIII	be constructed.					





EMG



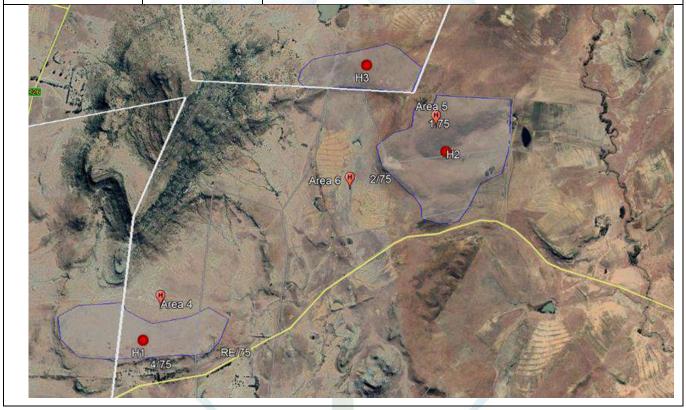
Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

## **Hobhouse**

The following dolerite locations are located on municipal owned land:

Name	Coordinates	Farm Name	Municipal Land (Y/N)			
AREA H2 (Previous	-29.504721°S	Gorrastad 75/1,2,4	Yes			
Study)	27.204248°E	Gorrastad 75/1,2,4	res			
<b>Expected Material</b>	Distance from	Comments				
Quality	Town	Comments				
Dolerite G5 – G6	6 km	A small access road needs to be constructed.				







Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

## **Excelsior**

The following dolerite locations are located on municipal owned land:

Name	Coordinates	Farm Name	Municipal Land (Y/N)			
AREA 2	-28.930791°S	Excelsior 358/RE	Yes			
AILAZ	27.086397°E	EXCOSION 550/TC	res			
Expected Material	Distance from	Comments				
Quality	Town	Comments				
Dolerite G5 – G6	6.5 km	Resource is of limited extent				





EMG



Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

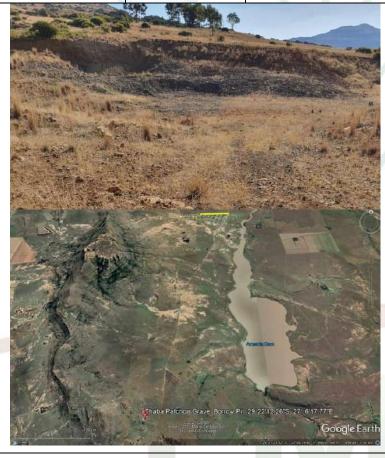
Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

## **Tweespruit (Thaba Patchoa)**

The following dolerite locations are located on municipal owned land:

No areas were identified on municipal land during the EMG feasibility study. It is recommended that the existing borrow pit, as brought to the attention of EMG by Mr Tsepo Selepe on the 7<sup>th</sup> June 2021, be used. The source is likely to be very low quality dolerite as numerous small borrow pits of low quality materials were opened next to the R 709 (in the immediate vicinity) leading to Thaba Patchoa from Tweespruit.

Name	Coordinates	Farm Name	Municipal Land (Y/N)
New area	-29.369998°S	Mammas Hoek 802/RE	Yes
New area	27.104723°E	Wallinas Hoek 602/INL	163
Expected Material	Distance from	Comments	
Quality	Town	Comments	
Unknown. Probable	5.5 km	Not inspected during site	foogibility ctudy
low quality dolerite.	J.J KIII	Two inspected during site	leasibility study.



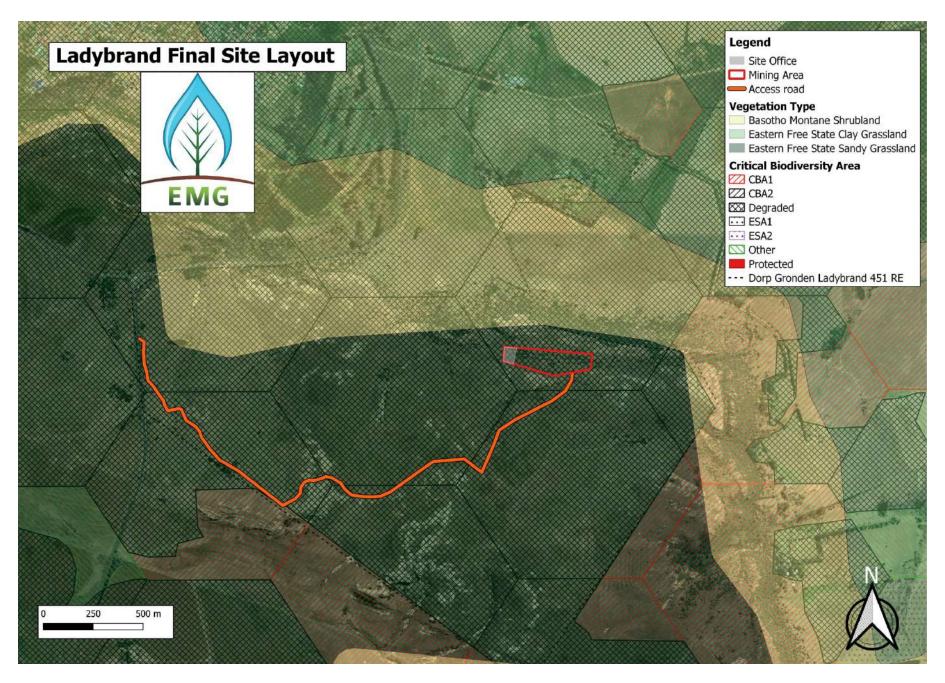


Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment



**Final Site Map** 



FINANCIAL PROVISIONS QUANTUM CALCULATION

Note that no financial provision report will be submitted by the Mantsopa Local Municipality.

**REHABILITATION AND CLOSURE PLAN** 

## REHABILITATION AND CLOSURE PLAN

#### 1. INTRODUCTION

Quarrying operations are finite economic activities, which is usually relatively short term. The long term environmental and social performance of a site is noticeable once mine closure and mine site operations have ceased, however the environmental, social and economic impacts are determined by the processes and procedures which occur during both the mining and mine closure phase.

The mine operator must perform progressive rehabilitation as material extraction is done. Progressive rehabilitation means rehabilitation done sequentially within a reasonable time after extraction of resources is complete. As one area of their mine is being extracted, rehabilitation must be completed in the areas where the mine reserves have been stopped or exhausted. Progressive rehabilitation is beneficial in many ways as it reduces the open areas within a mine, reduces soil erosion potential and reduces double-handling of soils and spoil material.

#### 2. REGULATORY REQUIREMENTS AND SPECIAL CONDITIONS

The following key regulatory requirements and conditions were documented for closure in the environmental management program:

- Mineral and Petroleum Resources Development Act (Act 28 of 2002)
- Mine Safety and Health Act, 1996 (Act 29 of 1996)
- The National Water Act, 1998 (Act 36 of 1998)
- The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983).
- National Environmental Management Act (Act 107 of 1998)

The summary of the regulatory requirements pertaining to closure mentioned in the Environmental Management Program are:

- a) All waste to be disposed of at authorised disposal sites.
- b) No ponding of water will be allowed to limit drainage disruption and the risk of groundwater pollution.
- c) The mined areas are to be landscaped to a profile in line with the surroundings.
- d) On completion of the mining process all topsoil should be spread back on disturbed surfaces to enable vegetation to grow again.

#### 3. KEY OBJECTIVES OF CLOSURE

The closure management objectives take into account the existing environment, environmental impacts and the expectations at closure. To ensure that the closure objectives are informed by the type of environment, the anticipated impacts and damage at closure, the sensitivity of the area and expected post closure land use were taken into account. In doing so, principles of integrated environmental management were taken into account together with the principles of sustainable development. The closure objectives are:

- To create a post mining environment that eliminates unacceptable health hazards and ensures public safety.
- To leave the site in a stable, non-polluting and tidy condition with no remaining plant or infrastructure that is not required for post mining operational use.
- To minimise or eliminate the downstream environmental impacts on the ecosystem due to interruption of drainage once the mine operations cease.
- To rehabilitate the disturbed areas to an end land use similar to that prior to commencement of any mining activities as far possible; in this case grazing land.
- To establish a stable post-mining land surface which has been rehabilitated.

#### 4. MECHANISMS FOR MONITORING COMPLIANCE

Effective monitoring, review and evaluation provide information on emerging issues, improve performance and ensure accountability of the closure activities. Photographs of the camp and office sites, before and during the mine operational period and after rehabilitation, shall be taken at selected fixed points and kept on record.

#### 4.1. MONITORING

Successful monitoring delivers timely and relevant information that allows tracking of progress towards outcomes and allows adjustments to implementation arrangements as necessary. The day-to-day monitoring and verification that the EMPr and Closure and Rehabilitation Plan are being adhered to shall be undertaken by the Contactor or mine operator appointed by the Mantsopa local municipality.

#### 4.2. REVIEWING AND AUDITING

An independent Environmental Control Official shall visit the site quarterly during the closure and rehabilitation process to ensure that the provision of closure and rehabilitations are being met. A report on non-conformances observed will be made and submitted to the applicant. Reviews of the closure plan and financial provisions will be made yearly to ensure that the plan is relevant and adequate.

#### 5. LAND END -USE PLAN

The proposed mining area is located on farmland currently used primarily for grazing. At the end of the closure after vegetation has been re-established, the area will revert back to an open area grazing land.

#### 6. TIME FOR IMPLEMENTING THE CLOSURE PLAN

The closure and rehabilitation activities are to be implemented immediately at the cessation of the extraction of quarry material from the proposed mine/quarry.

#### 7. ENVIRONMENTAL RISK REPORT.

A risk assessment will be taken at the end of the mining period. The purpose of this risk assessment will identify the risks present at the closure of the mine/quarry, to evaluate them and have management measures in place so as to eliminate the risk or reduce the risks to levels that are in line with legal requirements, acceptable to the community and have long term sustainability.

#### 8. FINAL ENVIRONMENTAL PERFORMANCE ASSESSMENT

A final environmental performance assessment is to be done at the end of the mining of the quarry. The scope of the performance assessment is to identify any deviation from the Environmental Management Program measures and any outstanding issues regarding the final rehabilitation of the mined site.

#### 9. REHABILITATION MEASURES

#### 9.1. PROGRESSIVE REHABILITATION

Mining is to be done in sections to allow progressive rehabilitation during mining to take place. If during mining of the quarry it is deemed that the mined section will no longer be mined again, then the area can be rehabilitated as after cessation of the mining of the section. The area is to be properly profiled and the sides sloped and smoothened. This is done in order to improve the visual impact of the area and to simplify the management of storm water runoff and improve slope safety. Top soil is to be put back on the disturbed surfaces to enable the re-vegetation process to take place.

#### 9.2. REHABILITATION OF ACCESS ROADS

- Whenever the mine is suspended, cancelled or abandoned any access road or portions thereof, constructed by the holder of the environmental authorisation and which will no longer be required by the landowner, shall be removed and rehabilitated to the satisfaction of the owner.
- Any gate or fence erected by the appointed mine operator which is not required by the landowner/tenant, shall be removed and the situation restored to the pre-mine situation.
   However the pit fence should be left intact until all the vegetation has fully recovered on site and the area is safe.
- Roads shall be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road materials which may hamper regrowth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation.

• If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, the soil must be analysed and any deleterious effects on the soil arising from the quarry, be corrected and the area be seeded with a seed mix which is similar with the vegetation of the area.

#### 9.3. OFFICES, STORAGES AREA AND PLANT STRUCTURES

- On completion of operations, all buildings, structures or objects on the site shall be demolished and removed.
- Where office/camp sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped.
- On completion of mine operations, the above areas shall be cleared of any contaminated soil, which must be disposed of through a licensed disposal facility or operator.
- All infrastructure, equipment, plant and other items used during the mining period will be removed from the site
- Waste material of any description, including receptacles, scrap, rubble and tyres, will be removed entirely from the mining area and disposed of at a registered waste disposal facility. It will not be permitted to be buried or burnt on the site.
- Photographs of the sites, before and during the mining and after rehabilitation, shall be taken at selected fixed points and kept on record.
- The surface shall then be ripped or ploughed and the topsoil previously stored shall be spread evenly to its original depth over the whole area. The area shall then be fertilised if necessary (based on a soil analysis).
- The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, there might be need for the soil be analysed and any deleterious effects on the soil arising from the mining operation be corrected and the area be re-seeded with a suitable vegetation seed mix that is matches the local flora.

#### 9.4. REHABILITATION OF EXCAVATION AREAS

- Excavated areas should be kept in a safe and stable manner. No unstable block should be present. Reshaping of the excavated area may need to be done to ensure that this objective is reached.
- Preventative measures may be necessary during closure to construct adequate drainage structures including ditches and other structures to facilitate the movement of surface water and prevent damming. An assessment will need to be done when mining has ceased to determine if there is need for such measures. The objective of these measures is to avoid water build-up that affects the physical stability of the slopes and also interferes with the drainage of the whole area.
- The excavated area must serve as a final depositing area for the placement of overburden and un-used material.

- Rocks and coarse material removed from the excavation must be backfilled into the
  excavation. General waste and hazardous waste will not be permitted to be deposited in
  the excavations.
- Once excavation parts that can be filled have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored shall be returned to its original depth over the area.
- The area shall be fertilised if necessary to allow vegetation to establish rapidly. The site shall
  be seeded with a local or adapted indigenous seed mix in order to propagate the locally or
  regionally occurring flora.
- If a reasonable assessment indicates that the re-establishment of vegetation is unacceptably slow, there may be need for the soil to be analysed and any deleterious effects on the soil arising from the quarry, be corrected and the area be seeded with a vegetation seed mix that matches the local indigenous flora.

The environment affected by the operations shall be rehabilitated, as far as is practicable, to its natural state or to a predetermined and agreed standard or land use which conforms with the concept of sustainable development. The affected environment shall be maintained in a stable condition that will not be detrimental to the safety and health of humans and animals and that will not pollute the environment or lead to the degradation thereof. The rehabilitation activities shall require the re-planting of vegetation in areas cleared for the mine activities. This will promote soil stability, improve the visual environment and provide faunal habitat into the operation stage.

#### 10. MANAGING IMPACTS ARISING FROM UNDERTAKING CLOSURE ACTIVITIES

The undertaking of the closure and rehabilitation activities is not expected to generate additional impacts that are different from the ones generated during the operational stage of the mine. The impact mitigation and management measures that are provided in the environmental management program are deemed adequate to manage the impacts arising from the closure process itself. However in the event those additional new issues are noted, appropriate mitigation will be put in place to manage the impacts.

#### 11. LONG TERM MANAGEMENT AND MAINTENANCE AFTER CLOSURE

No long term monitoring and maintenance is expected. There is no risk of acid mine drainage.

#### 12. PUBLIC PARTICIPATION PROCESS FOR CLOSURE PLAN

The public participation process for the closure plan was done as part of the basic assessment process and the details are provided for in Appendix 3.

#### 13. FINANCIAL PROVISIONS FOR CLOSURE

No financial provision will be submitted by the Mantsopa Local Municipality. The rehabilitation and the subsequent costs will all be the responsibility of the contractor, which will be overseen by an Environmental Compliance Officer and DMR.

#### 14. CONCLUSION

Proper profiling of the disturbed areas and re-vegetation of the areas will result in proper rehabilitation of the mined areas. The closure plan serves to provide details of the closure activities to be undertaken based on the anticipated mode of operation of the mine/quarry. It is expected that adequate implementation of the closure activities as stated in this document will minimise the negative impacts of the mine/quarry on the environment and enable a self-sustaining ecosystem to be re-established. If during the closure stage any unanticipated aspects occur, these should be assessed immediately and adequate mitigation measure implemented to minimise their effect at and after closure.

**ENVIRONMENTAL MONITORING PLAN** 

## **ENVIRONMENTAL MONITORING PLAN**

#### INTRODUCTION.

A number of potential environmental impacts, mitigation measures and environmental management controls are laid out in this document. The effective implementation and monitoring of the EMPr requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the project life cycle. The key roles for the successful implementation of the mitigation of the project are the Applicant, the appointed contractor or operator of the mine and the independent environmental control officer.

#### The Applicant – Mantsopa Local Municipality.

It is the responsibility of the project applicant to ensure that the mitigation on all work is compliant with the requirements of the EMPr. The applicant shall ensure that competent people are employed on the project by its contractor. Where necessary a skills development program will be instituted to ensure that the required levels of competency are attained. The applicant should ensure that the selected contractor is able to adequately deal with the environmental challenges in this project.

#### The Appointed Contractor/ Operator

The contractor refers to the team/company appointed by the Applicant to undertake the developmental activities for the mine/quarry. The word contractor and quarry operator is used interchangeably in the document. The Contractor shall have the following responsibilities:

- To implement all provisions of the EMPr and ensure that the appropriate levels of measuring and monitoring are done.
- To ensure that all staff and sub-contractors are familiar with the EMPr and that duties and responsibilities of employees working on site include environmental responsibilities pertaining to the nature of their work.
- To make personnel aware of environmental issues and to ensure they show adequate consideration of the environmental aspects of the project.
- To report any incidents of non-compliance with the EMPr to the ECO and the applicant.

#### The Independent Environmental Control Officer (ECO)

In order to ensure compliance and ensure that adequate monitoring and auditing is done of the mining activities, the applicant shall appoint an independent Environmental Control Officer (ECO) to monitor the implementation of the recommendations made herein. The ECO must undertake monthly audits in respect of compliance with the EMPr and report to the applicant and the contractor/quarry operator if areas of non-conformance are identified. The ECO shall also inform the applicant and its contractors/quarry operators on any identified opportunities for improving environmental performance.

#### **MONITORING MATRIX**

The expected monitoring requirements are shown in the Table provided.

	ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY		
Α	Social Issues					
	Community Complaints	Recording No. Of complaints received	Monthly record of incidents	Contractor		
	Fair Labour Recruitment	Recording Local Vs Migrant labour	Monthly key labour statistics	Contractor		
В	General Site Issues		1	1		
	Location of parking, offices etc.	Visual check of site suitability	At start-up	Contractor		
	Vegetation Clearance	Areas cleared	At start up, Ongoing during life of Mine (LOM)	Contractor		
	Surface or gully erosion on site	Visual check of surfaces	Ongoing during LOM. Record NCs Monthly	Contractor		
	Adequacy of fencing and beacons	Visual check of integrity of fencing	Ongoing during LOM. Record NCs Monthly	Contractor		
	Suitability of storage areas for waste	Check no. of receptacles and bunding	Ongoing during LOM, Record NCs Monthly	Contractor		
	Fire Breaks	Visual check	Ongoing during LOM, Record NCs Monthly	Contractor		
	Proper functioning of sanitation facilities	Check that there is no overflows & effluent spillages	Ongoing during LOM, Record NCs Monthly	Contractor		
	Control of Fires/Prevention of burning	Monitor incidences of non-compliance Check that firefighting equipment is serviced	Ongoing during LOM, Record NCs Monthly	Contractor		
	Overall appearance of site/housekeeping	Visual check of litter and order	Ongoing during LOM, Record NCs Monthly	Contractor		
2	Worker conduct					
	General environmental awareness training	Record people and issues trained	At recruitment and start-up, then as necessary Keep training records	Contractor		
	Prohibition of hunting and gathering	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor		
	Limitation of access to operational mine areas.	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor		
D	Equipment Maintenance					
	Adequate Maintenance of Vehicles	Check compliance with schedule	Ongoing during LOM, Keep monthly maintenance records	Contractor		
	Oil Leaks and spills clean-up	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor		
	Excessive vehicular emissions control	Monitor incidences of non-compliance	Ongoing during LOM, Record NCs Monthly	Contractor		

	ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY		
E	Material Storage			Contractor		
	Suitability of storage facilities	Record material usage Check receptacles and bunding integrity	Ongoing during LOM, Keep monthly usage records	Contractor		
F	Waste Management			1		
	Efficiency of collection of waste streams	Record waste disposed	Ongoing during LOM, Record Monthly disposal	Contractor		
	Adequacy of storage receptacles	Visual checks	Ongoing during LOM, Record NCs Monthly	Contractor		
	Containment of liquid waste	Visual checks of leakages & bunding	Ongoing during LOM, Record NCs Monthly	Contractor		
	General Cleanliness of area	Visual checks of no littering	Ongoing during LOM, Record NCs Monthly	Contractor		
	Containment of contaminated waste	Visual check of bunding & receptacles	Ongoing during LOM, Record NCs Monthly	Contractor		
G	Excavations, Exposed Surfaces, screening					
	Stability of slopes	Visual checks of cracks and failure signs	Ongoing during LOM, Record NCs Monthly	Contractor		
	Safety signs and demarcations	Visual checks of integrity	Ongoing during LOM, Record NCs Monthly	Contractor		
	Adequacy of site drainage	Check that storm water is moving freely	Ongoing during LOM, Record NCs Monthly	Contractor		
	Dust Suppression on dust generating area	Check adequacy of water spraying	Ongoing during LOM, Record NCs Monthly	Contractor		
	Surface erosion on site	Visual check of surfaces	Ongoing during LOM, Record NCs Monthly	Contractor		
Н	Water					
	Cleaning up of contaminated soils	Report incidences of non-conformances	Ongoing during LOM, Record NCs Monthly	Contractor		
	Water Consumption at site	Report amount of water used	Ongoing during LOM, Record NCs Monthly	Contractor		
I	Drilling and Blasting	Drilling and Blasting				
	Dust Suppression	Visual check before & after blasting	Ongoing during LOM, Record NCs Monthly	Contractor		
		Record key parameters				
	Warning of workers and public	Check signs and documents before blasting.	Ongoing during LOM, Record NCs Monthly	Contractor		
J	Final Rehabilitation					
	Removal of infrastructure	Visual check of removal, Keep removal records	At decommissioning, Record of Disposal	Contractor		
	Rehabilitation of access roads	Visual check	At decommissioning, Record NCs Monthly	Contractor		

ISSUE	MONITORING METHODOLOGY	MONITORING FREQUENCY	RESPONSIBILITY
Removal of contaminated soils	Record disposal record	At decommissioning, Monthly disposal record	Contractor
Reshaping of the quarry and stabilisation	Visual check	At decommissioning	Contractor
Establishment of adequate drainage structure	Visual check of non-pooling	At decommissioning, Record NCs Monthly	Contractor
Replanting with indigenous local species	Record areas planted	At decommissioning, Keep record of action done	Contractor
Checking the re-vegetation efforts	Visual check	Quarterly thereafter	Contractor

**ENVIRONMENTAL AWARENESS PLAN** 

### **ENVIRONMENTAL AWARENESS AND TRAINING PLAN**

#### 1. Introduction

The successful implementation of the EMP is hinged on adequate environmental awareness training of employees. The workforce needs to understand their role in the achievement of the objectives specified in the EMPr. All operational staff should be provided with environmental awareness training and employees who require specialised training in line with the nature of their job should be provided with such training.

#### 2. What the training and awareness should cover.

Mining employees and subcontractors are required to attend a site induction addressing environmental issues prior to commencing duties. Environmental content to be covered include:

- Making employees aware that everyone has a right to a clean environment and that everyone
  has a responsibility to protect the environment.
- Explanation of the importance of complying with the EMPr
- Discussion of the potential environmental impacts of mining activities and mitigation measures that must be implemented when carrying out activities
- Explanation of the management structure of individuals responsible for matters pertaining to the EMPr.
- Employees' roles and responsibilities, including emergency preparedness.
- Explanation of the specifics of the EMPr and its specification.

It is recommended that a short induction lecture on environmental awareness be done on all workers including contractors and casual workers who will work at the mine. The topics covered are to include the following environmental topics:

- Waste management
- Artefacts
- Storage of hazardous materials
- Fires
- Importance of good house keeping
- Noise
- Importance of water conservation
- Dust management
- And emphasize importance of minimizing vegetation removal and rehabilitation

The training should include showing on the site area, areas where vegetation clearance is not to be done, showing the personnel No Go areas, locations for stockpiles and access roads to be used.

Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. A record of people who have been trained and the training done shall be kept

#### 3. Training on Emergencies.

All personnel should be trained on how emergencies on site will be handled.

- The contractor / quarry operator should identify all situations that can lead to emergency situations and provide response strategies. The situations should include fire and major chemical spill.
- Contact details of all departments/service providers to be contacted in case of an emergency shall be made available to employees.
- Equipment for dealing with emergencies such as spill kits, firefighting equipment, first aid boxes etc. shall be made available and personnel properly trained in its use.
- All staff on site should be trained on how to handle emergency situations and emergency drills/ rehearsals should be conducted periodically to ensure that staff is prepared.

**PROPERTY TILE DEEDS DETAILS** 

Suite G01, Waterview 2, Waterview Close, Century City Tel: +27 860 340 000 Website: https://www.searchworks.co.za

SEARCH INFORMATION		
Summary		
Search Type	DEEDS OFFICE PROPERTY FARM	
Search Description	451 LADYBRAND RD, P:0 (BLOEMFONTEIN)	
Reference	CHRISTIEN	
Date	12/04/2021	

FARM INFORMATION	
Summary	
Deeds Office	BLOEMFONTEIN
Property Type	FARM
Farm Name	DORP GRONDEN LADY BRAND
Farm Number	451
Portion Number	O (REMAINING EXTENT)
Previous Description	-
Registration Division	LADYBRAND RD
Municipality	MANTSOPA LOCAL MUNICIPALITY
Province	FREESTATE
Diagram Deed	G00/1878
Size	9140.0000 SQM
LPI Code	F0210000000045100000

OWNER SUMMARY			
Owner Name	ID / Reg. Number	Purchase Price	Purchase Date
MANTSOPA LOCAL MUNICIPALITY	-	R 14,00	UNKNOWN
MANTSOPA LOCAL MUNICIPALITY	-	TRANSFER BY ENDO	UNKNOWN

OWNER INFORMATION		
Owner 1 of 2		
Owner Name	MANTSOPA LOCAL MUNICIPALITY	
ID / Reg. Number	-	
Owner Type	COMPANY	
Title Deed	T33727/1887	
Purchase Date	UNKNOWN	
Registration Date	29/07/1887	
Purchase Price	SECT 14	
Multiple Owners	NO	
Multiple Properties	NO	
Share	-	
Microfilm Reference No.	2008 0183 2904	

OWNER INFORMATION (CONTINUED)			
Owner 2 of 2	Owner 2 of 2		
Owner Name	MANTSOPA LOCAL MUNICIPALITY		
ID / Reg. Number	-		
Owner Type	COMPANY		
Title Deed	T12567/2008		
Purchase Date	UNKNOWN		
Registration Date	01/01/1900		
Purchase Price	TRANSFER BY ENDO		
Multiple Owners	NO		
Multiple Properties	NO		
Share	-		
Microfilm Reference No.	2008 0183 2967		

ENDORSEMENT(S)					
Document Number	Microfilm Reference Number	Institution	Value		
EX241/2014	-	173/8/58/64	UNKNOWN		
I-1589/1978LG	-	-	UNKNOWN		
I-1589/1982C-820602	-	-	UNKNOWN		
I-1287/1999-I	-	T33727/1987	UNKNOWN		
I-1906/2008C	2008 0157 5754	T33727/1887	UNKNOWN		
I-1664/2016LG	-	T33727/1887	UNKNOWN		
I-2112/2007-I	2008 0179 4922	T33727/1887	UNKNOWN		
I-2716/2003C	-	T11506/1993 & OTHERS	UNKNOWN		
I-2984/2010LG	-	SG219/2010	UNKNOWN		
I-2477/2011LG	-	SG205/2007	UNKNOWN		
I-3883/1978LG	-	-	UNKNOWN		
I-3207/2006C	2007 0431 3074	T33727/1887	UNKNOWN		
I-358/2014LG	-	SG345/2014	UNKNOWN		
I-335/2014LG	-	SG259/1996	UNKNOWN		
I-4549/1979C-791127	-	-	UNKNOWN		
I-4773/1997LG-970805	-	-	UNKNOWN		
I-4988/2009LG	-	SG1589/2009-20091027	UNKNOWN		
I-5340/1997LG	-	-	UNKNOWN		
I-6780/1998C	-	T33727/1887	UNKNOWN		
I-667/2008C	2008 0078 1932	T33727/1887	UNKNOWN		
I-786/2007C	2008 0009 2938	T33727/1887	UNKNOWN		
K491/1979S	-	-	UNKNOWN		
K769/1997RM	-	-	UNKNOWN		
VA13/1938-T33727/188	-	7	UNKNOWN		
VA1185/2008	2008 0182 2761	MANTSOPA LOCAL MUNICIPALITY	UNKNOWN		

ENDORSEMENT(S)				
Document Number	Microfilm Reference Number	Institution	Value	
VA424/2011	-	MANTSOPA LOCAL MUNICIPALITY	UNKNOWN	
339/1964S	-	-	UNKNOWN	
LADYBR RD,451	-	-	UNKNOWN	

HISTORY INFORMATION				
Document Number	Microfilm Reference Number	Owner	Value	
T26786/2001	2001 0293 1055	-	UNKNOWN	
T33727/1887	2008 0183 2904	MANTSOPA LOCAL MUNICIPALITY	UNKNOWN	
T12567/2008	2008 0183 2967	-	UNKNOWN	
T33727/1887	2008 0183 2904	MANTSOPA LOCAL MUNICIPALITY	R 14,00	

INTERNAL ENQUIRY HISTORY					
Company Name	Contact Person	Contact Number	E-mail Address	Enquiry Date	
No information available.					

REPORT INFORMATION		
Date of Information	12/04/2021 09:03	
Print Date	12-04-2021 09:03	
Generated By	CHRISTIEN KRUGER	
Reference	CHRISTIEN	
Report Type	DEEDS OFFICE PROPERTY FARM	E340004418 = 3

The data displayed above is provided by our data suppliers and is not altered by SearchWorks. Terms of Use are applicable to this information and can be found on https://app.searchworks.co.za/. SearchWorks is not liable for any damages caused by this information.



## **ENVIRONMENTAL MANAGEMENT GROUP**

Tel: +27 51 412 6350 Fax: +27 51 412 6351 Email: ckruger@envmgp.com Postal Address: P.O.Box 37473, Langenhoven Park 9330

Specialists in Environmental Management
Integrating Industry and Infrastructure with the Environment

# COPY OF RESOLUTION, DORP GRONDEN LADYBRAND 451/RE, LADYBRAND, FREE STATE

19 July 2021

Department of Mineral Resources – Free State The Strip, 314 C/O Stateway & Bok Street WELKOM 9459

Telephone: (057) 391 1300

Email: Kalipa.Kewuti@dmre.gov.za

Attention: Ms Kalipa Kewuti

The property on which the proposed borrow pit will be situated (Dorp gronden landybrand 451/RE) is state owned land, as such no resolution is required. The applicant is an organ of state (Mantsopa Local Municipality)

Yours Faithfully

CW Vermeulen

Environmental Management Group.

**Legislative Context** 

NEMA Listing Notice 1, Activity No. 21, GNR 327 of 7 April 2017

NEMA Listing Notice 1, No. 27 of 327 of 7 April 2017

Mineral and Petroleum Resources Development Act, No. 28 of 2002 (as amended)

National Environmental Management Act, No. 107 of 1998 as amended