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EKO GROUP (PTY) LTD trading as Eko Environmental
Reg no. 2017/311178/07
VAT No. 4020225811

FINAL NEMA BAR AND EMPr:

IN SUPPORT OF A MINING PERMIT AND
ENVIRONMENTAL AUTHORISATION APPLICATION FOR
THE ESTABLISHMENT OF A QUARRY ON REMAINDER OF
FARM DE HOOP 320, BLOEMFONTEIN, FREE STATE

DMR Ref. No.: FS 30/5/1/3/2/10301 MP
Case Officer: Tuwani Monyai
Tuwani.Monyai@dmr.gov.za

November 2020

Applicant:

WLS Trust

Contact person: Mrs Sonja van der Merwe
P.O. Box 32828
Fichardtpark
Bloemfontein
9317
Tel: 082 828 8007



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

BASIC ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT: WLS Trust

TEL NO: 051 430 0200

FAX NO:

POSTAL ADDRESS: Box 32838, Fichardtpark, Bloemfontein, 9301

PHYSICAL ADDRESS: 21 Vansoelen Street, Fichardtpark, Bloemfontein, 9301

FILE REFERENCE NUMBER SAMRAD: FS 30/5/1/3/2/10301 MP

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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 uninterpreted 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 ASSESSMENT AND BASIC ASSESSMENT REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: Eko Environmental (Mr. Richard Williamson)

Tel No.: 051 444 4700

Fax No. : 086 653 5718

e-mail address: richard@ekogroup.co.za

ii) Expertise of the EAP.

(1) The qualifications of the EAP

(with evidence). Masters in Environmental Management - University of the Free State

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

(In carrying out the Environmental Impact Assessment Procedure)

SELECTED ENVIRONMENTAL EXPERIENCE:

Name of Project: Township establishment on Bloemspruit plot 146,
Project Duration: April 2018 – Sep 2018
Location: Bloemfontein, Free State, South Africa
Client: Urban Dynamics (Lenova Construction and Development)
Project Description: Obtaining Environmental Authorisation for township establishment on Bloemspruit plot 146
Position & Duties: Project Environmental Assessment Practitioner

Name of Project: Township establishment on Remainder of farm Bergendal 1706
Project Duration: April 2018 - present
Location: Bloemfontein, Free State, South Africa
Client: Urban Dynamics (Pitberg CC)
Project Description: Obtaining Environmental Authorisation for township establishment on Bloemspruit plot 146
Position & Duties: Project Environmental Assessment Practitioner

Name of Project : Township establishment on Lilyvale plot 30/2313
Project Duration: April 2018 - present
Location: Bloemfontein, Free State, South Africa
Client: Urban Dynamics (Lenova Construction and Development)
Project Description: Obtaining Environmental Authorisation for township establishment on Lilyvale plot 30/2313
Position & Duties: Project Environmental Assessment Practitioner

Name of Project : Chicken layer houses on farm Tochgeluk 37
Project Duration: April 2018 – Present
Location: Brandfort, Free State, South Africa
Client: Barry Bekker (private individual)
Project Description: Obtaining Environmental Authorisation construction of chicken layer houses for the production of eggs on farm Tochgeluk 37
Position & Duties: Project Environmental Assessment Practitioner

Name of Project : Chicken broiler houses on farm Fransina 2060
Project Duration: April 2018 – Present
Location: Botshabelo, Free State, South Africa
Client: Pieter du Plessis (private individual)
Project Description: Obtaining Environmental Authorisation construction of chicken houses for the production of poultry on farm Fransina 2060
Position & Duties: Project Environmental Assessment Practitioner

Name of Project : The construction of Dawiesville Primary School
Project Duration: April 2018
Location: Tweespruit, Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conducted monthly environmental compliance audits during the construction of Dawiesville Primary School
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : The construction of Ebenhaeserhoogte Intermediate School
Project Duration: April 2018 – May 2018
Location: Wepener, Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conducted monthly environmental compliance audits during the construction of Ebenhaeserhoogte Intermediate School
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : The construction of Hermana Primary School
Project Duration: April 2018 – May 2018
Location: Tweespruit, Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conducted monthly environmental compliance audits during the construction of Hermanca Primary School
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : NRA N001-170-2014/2: The rehabilitation and upgrade of the N1 between Ventersburg and the Holfontein Interchange
Project Duration: April 2018 – Present
Location: Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conducted monthly environmental compliance audits during the rehabilitation and upgrading of the N1 between Ventersburg and the Holfontein Interchange
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : NRA-N001-170-2014/4: Ventersburg Dorpsgronden Quarry
Project Duration: April 2018 – Present
Location: Ventersburg, Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conduct monthly environmental compliance audits while the Venetersburg Dosprgronden Quarry remains active until rehabilitation is completed.
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : NRA N001-170-2014/3: The rehabilitation and upgrade of the N1 between Kroonstad and the Holfontein Interchange
Project Duration: April 2018 – Present
Location: Free State, South Africa
Client: SMEC South Africa (Pty) Ltd
Project Description: Conducted monthly environmental compliance audits during the rehabilitation and upgrading of the N1 between Kroonstad and the Holfontein Interchange
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : The township establishment on the Remainder of Farm Hillandale 2960
Project Duration: April 2018 – Present
Location: Bloemfontein, Free State, South Africa
Client: CDL (Clarence De Wet Lesela)
Project Description: Conducted monthly environmental compliance audits during the construction of the township establishment on the Remainder of Faem Hillandale 2960
Position & Duties: Environmental Compliance Officer responsible for enforcing environmental compliance in regards to the RoD and EMPr. Conducted monthly environmental compliance audits.

Name of Project : Application for a Mining Permit for the establishment of a quarry on Portion 1 of the Farm Plooyfontein 93/1
Project Duration: August 2018 – Present
Location: Hanover, Northern Cape, South Africa
Client: African Mining and Crushing SA (Pty) Ltd
Project Description: Application for a Mining Permit for the establishment of a quarry on Portion 1 of the Farm Plooyfontein 93/1
Position & Duties: Environmental Assessment Practitioner responsible for the application of the mining permit.

Name of Project : Annual Audit of Compliance to the Water Use License for West End Diamond Mine
Project Duration: August 2018 – Present
Location: Postmansburg, Northern Cape, South Africa
Client: Rex Exploraion (Pty) Ltd
Project Description: Annual Audit of Compliace in regards to the Water Use License for the mine
Position & Duties: Environmental Compliance Officer responsible for enforcing compliance in regards to the Water Use License. Conducted an annual compliance audit.

Name of Project : Compliance Audit to the Water Use License for Groengoud Boerdery
Project Duration: September 2018
Location: North West Province, South Africa
Client: Winter Strom Investment 110 CC
Project Description: Conducted a compliance audit in regards to the Water Use License for Groengoud Boerdery
Position & Duties: Environmental Compliance Officer responsible for enforcing compliance in regards to the Water Use License. Conducted an annual compliance audit..

b) Location of the overall Activity.

Farm Name:	De Hoop 320
Application area (Ha)	4.5ha
Magisterial district:	Bloemfontein
Distance and direction from nearest town	Bloemfontein is situated approximately 16km north-east of the proposed site
21 digit Surveyor General Code for each farm portion	F00300000000032000000

c) Locality map

(show nearest town, scale not smaller than 1:250000). Refer to the Locality maps attached in Appendix A

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

Attached to site map Appendix A

(i) Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc 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, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)
The mining of dolerite for aggregate which requires a mining permit in terms of Section 27 of the Minerals and Petroleum Resources Development Act No 28 of 2002 (MPRDA), including associated	4.5ha	Activity 21 - GNR	GNR 327

- The topsoil and vegetation will be removed from an area of 4.5ha and will be stockpiled in this area. It should be noted that the topsoil and vegetation will only be removed from areas where mining will occur.
- The dolerite from the excavation area will be excavated and loaded onto trucks and removed from the site.

1.1.2 Description of construction, operational, and decommissioning phases:

Construction phase:

- The clearing of vegetation and topsoil to prepare for material excavation.
- The proposed mining area should be fenced off / clearly demarcated to prevent easy access to the site.
- Arrival of the equipment on site.
- Maintenance of existing access road.
- There will be no permanent buildings or structures constructed.
- Fuel will be kept inside a bunded area that can contain 110% of the volume of the fuel. However, it should be noted that, due to the scale of the mining operation there will not be large volumes of diesel and other petrochemical substances stored on site. It should be limited to a maximum of approximately 10000L.

Potential impacts identified related with the Construction phase:

- Stripping of topsoil and vegetation and the loss thereof.
- Generation of dust and noise.
- Potential erosion as a result of the clearance of vegetation.
- Spillage of potentially hazardous substances and the contamination of soil.

Operational phase:

- Excavation of dolerite from the demarcated mining area.
- Loading of excavated dolerite on trucks supplied by applicant.
- Mining shall only take place within the approved demarcated mining area.
- Topsoil will be removed from all areas where physical disturbance of the surface will occur.
- The topsoil removed must be stored on site
- Topsoil shall be kept separate from overburden and shall not be used for building or maintenance.
- The stored topsoil shall be protected from being blown away or being eroded.
- Overburden rocks (if any) shall be placed outside the excavated area or stored adjacent to the excavation to be used as backfill material once the dolerite has been excavated.
- There will be approximately 5 permanent employees on site, including skilled and unskilled employees.
- The following equipment will be used:
1 x Excavator
1 x Loader
The applicant will take trucks to the mining area to be loaded.
- There will be no permanent buildings or structures constructed.
- Fuel will be kept inside a bunded area that can contain 110% of the volume of the fuel. Lubricants will be kept in a bunded oil store and spares will be kept on site.
- Any waste generated on site will be managed appropriately and according to best practices.
- Temporary toilets will be used on site.

Potential impacts identified related with the Operational phase:

- Loss of topsoil during the stripping of topsoil and vegetation.
- Generation of dust and noise.

- c) Alteration of the landscape/topography.
- d) Pollution and degradation of watercourses.
- e) Dumping of waste.
- f) Impact on the quality and quantity of surface and groundwater.
- g) Contamination of soil as a result of spillage of petrochemical substances.

Decommissioning phase:

- a) All the equipment will be removed from the site.
- b) Any residual waste will be collected and removed from site. General waste will be disposed of at the authorised landfill site in the area, while recyclable waste (e.g. scrap metal) will be recycled as far possible. Any potential hazardous material left on site will be managed appropriately and disposed of at an authorised hazardous waste facility.
- c) The mined areas will be rehabilitated by sloping them. .
- d) Available topsoil will be used to cover exposed areas to be rehabilitated for the establishment of vegetation.
- e) Completing rehabilitation and apply for closure.
- h) The area will be fenced off in order to provide a safe environment and to prevent easy access to the site.

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 COMPLY 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)
National Environmental Management Act 107 of 1998, 2014 Regulations as amended in 2017	DEA - DESTEA	Notified of the project as commenting authority. Activities in terms of NEMA Regulations are applied for.
National Water Act 36 of 1998	DWS	Notified as I&AP.
Conservation of Agriculture Resources Act 43 of 1993	DAFF	Notified as I&AP
National Heritage Resources Act 25 of 1999	SAHRA	Phase 1 HIA conducted
Occupational Health and Safety Act and Regulations Act 85 of 1993	Department of labour	Implemented by contractor on site
MPRDA	DMR	Environmental Authorisation and mining permit applied for

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).

The proposed mining activities will provide dolerite for aggregate for construction purposes in the region. This will result in direct and indirect job opportunities in the area. It must be known that there is currently a shortage for such material from local suppliers in the region.

Direct job opportunities will be created for approximately 5 local people employed directly at the mining operation. Due to the scale of the operation it is not expected that more people will be appointed. However, in the event that the operation becomes busy it will employ temporary employees to assist. This will have a positive impact on the local economy directly related to these individuals and their families.

The mined dolerite is used in the construction industry in the region which result in jobs indirectly associated with the mining operation. It must be known that several contractors have already expressed interest in obtaining the material from this operation further emphasising the need for additional material in the region.

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

1 Preferred site:

This is the preferred site for the project as it is where the previous mining permit existed, before the current landowner and applicant, and it is known that suitable material exists at this location. In addition the previous quarry pit is still present which reduces the environmental impact of the current proposed site as they overlap.

2 Activities:

Dolerite material is used extensively in the construction industry in the region and there is currently a shortage in the amount and quality of such material in the region.

3 Technology alternative:

The operation is relatively small and an excavator is used to excavate and load dolerite onto loader trucks. The excavator that is planned to be used in this operation is a 2019 model that is fitted with modern technological innovations that helps reduce noise and dust and increases efficiency of the excavator.

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.

i) Details of the development footprint alternatives considered.

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

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

1 Preferred site:

This is the preferred site for the project as it is where the previous mining permit existed, before the current landowner and applicant, and it is known that suitable material exists at this location. In addition the previous quarry pit is still present which reduces the environmental impact of the current proposed site as they overlap.

2 Activities:

Dolerite material is used extensively in the construction industry in the region and there is currently a shortage in the amount and quality of such material in the region. .

3 Technology alternative:

The operation is relatively small and an excavator is used to excavate and load dolerite onto trucks. No other technological alternatives are considered as the transporting and excavating of the dolerite requires heavy machinery (i.e the excavator and loader trucks).

ii) Details of the Public Participation Process Followed

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

The following measures were implemented to ensure that the public is notified:

- A site notice was placed at the entrance to the property at the R706 and another site notice was placed at the entrance to the site,
- Two adverts were placed in a local english newspaper, namely the Bloemfontein Courant, on two alternative dates,
- Written notifications were sent to all authorities,
- Written notifications were sent to the adjacent landowners.
- Written consent was received from the landowner of the farm (the applicant is the landowner).

The following authorities were notified of the project by written notifications and background information documents (BID):

- Mangaung District Municipality - City Manager
- Mangaung District Municipality - Ward 18 ward councillor
- Mangaung District Municipality - General Manager: Environmental Department
- Mangaung District Municipality - General Manager: Planning Department
- South African Heritage Resource Agency
- Department of Water and Sanitation
- Department of Agriculture
- Department of Economic Small Business Development, Tourism and Environmental Affairs
- Department of Rural Development and Land Reform

The following adjacent landowners were notified in writing or via telephone or email:

- Mr. Hannes Sutherland - representative of the farm Kwestiefontein,

After the BID and notification the following comments were received:

Mangaung District Municipality - General Manager: Environmental Department confirmed receiving the BID and indicated that further commenting would follow upon receiving of the next phase of reports.

Mr Theuns Wolmarans from Symmington De Kok Attorneys contacted Eko Environmental indicating that he represents several of the surrounding farmers who are concerned about the proposed project. Eko Environmental sent the registration forms and the BID to Mr Wolmarans, to register as an I&AP, who then distributed them to those concerned. Those concerned then sent their concerns via email and a public meeting was then held between those with concerns, a representative of WLS trust (the applicant) and the EAP (Eko Environmental) in order to best clarify and address the issues that were raised. The minutes of the meeting can be found in the PPP in appendix D

Refer to Appendix D for the complete Public Consultation Process.

iii) **Summary of issues raised by I&As**
 (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 mandated by the applicant	Section and paragraph reference in this report where the issues and or response were incorporated.
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted.		Comments Received			
<u>AFFECTED PARTIES</u>					
Landowner/s	X				
WLS Trust	X	No Comments	None	None	
Lawful occupier/s of the land					
None					
Landowners or lawful occupiers on adjacent properties		X			
Mr Hannes Sutherland	X	24 January 2020	Mr Sutherland requested to view the site on the 24/01/2020 and Eko Environmental accompanied Mr Sutherland to the site. Mr Sutherland then had no further comments and stated that he has no issues with the project in question.	None	Appendix 4

Mr Dieter Wambach	X	18th February 2020	<ul style="list-style-type: none"> • Excessive dust and noise which will have a negative impact on his livestock • Disturbance in the natural habitat of plants and wild animals around the mining area • Extra use of groundwater for the mining operation which will impact surrounding farmers on availability and sustainability of groundwater resources. • Safety for humans and livestock for surrounding famers due to influx of people in the area. • Decrease in value of the property • Increase in traffic on the R706 which leads to a deterioration the road surface thereby affecting the safety of the road that is driven by many farmers with their families.e 	A public meeting was held on the 4th March 2020, which Mr Wambach attended, in which these concerns were responded to and addressed. The minutes of the meeting are included in this PPP report.	Appendix 4 under minutes of public meeting
Mr Marius Du Toit	X	18th February 2020	<ul style="list-style-type: none"> • The access road intended for the proposed project as it runs through the Farm owned by MAK Trust. • Excessive dust from the loader trucks which will affect surrounding crops. • The access roads close proximity to farm dwellings, sheds and workers houses on the farm Kwestiefontein 679/2.Noise and dust are the primary issues in this point. 	A public meeting was held on the 4th March 2020 in which these concerns were responded to and addressed. The minutes of the meeting are included in this PPP report.	Appendix 4 under minutes of public meeting
Mr Bruce Michael Gleimius	X	18th February 2020	<ul style="list-style-type: none"> • the safety of the area, • crime and stocktheft will escalate • Dust and blasting from the quarry • Heavy vehicles transporting the gravel 	A public meeting was held on the 4th March 2020 in which these concerns were responded to and addressed. The minutes of the meeting are included in this PPP report	Appendix 4 under minutes of public meeting

Municipal councillor	X		No comments		
Municipality	X	31 January 2020	Miss Ramongolo of the Environmental Department of the Municipality indicated that thorough commenting will occur upon receiving of the environmental reports.	None. Eko Environmental proceeding to make the environmental reports available for comment.	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA e					
DWS	X	No comments			
SAHRA	X	No comment			
DAFF	X	No comment			
Communities					
Dept. Land Affairs	X	No Comments			
Traditional Leaders					
Dept. Environmental Affairs	X	No Comments			

Other Competent Authorities affected				
<u>OTHER AFFECTED PARTIES</u>				
<u>INTERESTED PARTIES</u>				
Mr Theuns Wolmarans	18th February 2020	<p>Mr Theuns Wolmarans raised several concerns regarding this project on behalf of his client namely MAK Trust. The concerns include the following:</p> <ul style="list-style-type: none"> • The access road intended for the proposed project as it runs through the Farm owned by MAK Trust. • Excessive dust from the loader trucks which will affect surrounding crops. • The access roads close proximity to farm dwellings, sheds and workers houses on the farm Kwestiefontein 679/2.Noise and dust are the primary issues in this point. 	A public meeting was held on the 4th March 2020 in which these concerns were responded to and addressed. The minutes of the meeting are included in this PPP report.	Appendix 4 under minutes of public meeting
Mrs San-Mari Gleimius	18th February 2020	<ul style="list-style-type: none"> • the safety of the area, • crime and stocktheft will escalate • Dust and blasting from the quarry 	public meeting was held on the 4th March 2020 in which these concerns were responded to and addressed. The minutes of the meeting are included in this PPP report.	Appendix 4 under minutes of public meeting

iv) 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 mining area is located on a property where the land use is agriculture. The property is mainly used for animal grazing. The proposed site occurs at the site of an existing quarry that was present at the time that the applicant (WLS trust) purchased the land. The quarry was registered under Karibu Quarries with mining permit application number FS/30/5/1/3/2/232MP and MP26/2008. The mining permit has expired before the current landowner and applicant, WLS Trust, acquired the property.

Socio-Economic

The Free State makes up a total size of 129 825km² with Bloemfontein making out 236.2 km² of the total province size. The total population in the Free State was estimated at 2 745 590 people in the 2011 Census. The population of Bloemfontein was estimated at approximately 464,591 people of the total Free State population. The current population estimate for the Free State as determined in the 2016 Mid-year population estimates, is 2 861 600 people. These figures show a steady, constant growth in the population size (StatsSA, 2016). According to the reviewed integrated development plan 2017 – 18, about 50 000 people relocated from Botshabelo to Bloemfontein between 2007 and 2011. As a result of this, Bloemfontein now houses almost two thirds of the entire Mangaung Population. During the timeframe of 2001 to 2012, the unemployment status of Mangaung grew from 69 536 to 73 877 which represents an increase of 6.2% in the unemployment range. During the same timeframe illiteracy and no schooling decreased from 10, 1% in 1996 to 4, 3% in 2011. People with matric have increased from 18, 7% to 30.1% in 2011 (MMM, 2016).

Unemployment and job creation remain a key issue in the Free State especially in MMM as was outlined in the recent 2020 SOPA address by Premier Sisis Ntombela. In the fourth quarter of 2019 the province recorded an unemployment rate of 35% – the second highest in the country, behind the Eastern Cape. The proposed project plans to create at least 5 permanent jobs with the possibility of several temporary jobs depending on the success of the operation as well as contributing to the local economy.

Climate

The city of Bloemfontein falls under the Semi-Arid Aridity zone and. The central Free State consists of the Grassland Biome with three bioregions being predominant. These are the Gh 5 Bloemfontein Dry Grassland, Gh 7 Winburg Grass Shrubland and the smaller Gh 8 Bloemfontein Karroid Shrubland. The climate is largely characterised by a summer-rainfall area, with a mean annual rainfall of approximately 450 - 550 mm and a mean annual evaporation of approximately 2 200mm. Most of the rainfall is of convectional origin and peaks in late summer. The mean annual temperature varies between 14°C to 16°C which indicates a warm-temperate climatic regime. During the winter, temperatures can drop drastically with frequent frost occurrences (Mucina & Rutherford, 2006). It is not expected that the proposed establishment of the residential area will have any impact on the local climate in the area.

Geology

Bloemfontein and the immediate surrounding area falls under the Ea land type followed by Dc and Fa: The study area is underlain by the Adelaide Subgroup, which can be characterised by dolerite intrusions embedded within sedimentary rocks (mudstones and sandstones) of the Beaufort Group and Karoo Supergroup (Mucina & Rutherford, 2006).

Land Use

The proposed mining area is located on a property where the land use is agriculture. The property where the proposed project takes place, along with surrounding properties is mainly used for animal grazing and cultivation. The nearest circle pivots are visible approximately 200m east of the proposed site (which belong to the landowner and applicant - i.e WLS Trust) with the next closest being more than 1km east of the proposed project.

Heritage

For a detailed description please refer to the specialist study in appendix C.

Palaeontology

For a detailed description please refer to the specialist study in appendix C.

Surface Water

The topography of the site is dominated by a plain with a gradual slope from west to east. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site (approximately 1.5 km). The existing borrow pit is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

Groundwater

The Mangaung Metropolitan Municipality is not currently utilizing groundwater as a primary water supply resource for the supply of potable water to Bloemfontein. Groundwater is only used by individuals for irrigation of gardens and residential areas as well as small industries and micro irrigation for nurseries and garden centres. The Bloemfontein area falls under a minor aquifer region which is a moderately-yielding aquifer system of variable water quality (DWA, 2012). Groundwater is only used for agriculture towards the south-western areas such as the location of the proposed project. The proposed project intends to make use of groundwater for dust suppression. The applicant has a water use license for the proposed site and intends to make use of some of that water for the project.

Biodiversity

For a detailed description of the ecological baseline environment please refer to the specialist study in appendix C.

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004) (Map 2). As a result, where natural portions of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. The site in question is listed as being an Other and Degraded area according to the Free State Province Biodiversity Management Plan (2015). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey. The overall conservation value of the site is therefore relatively low.

No elements of high conservation value or sensitivity occur on the site footprint itself although the few specimens of protected *Brunsvigia radulosa* still has some conservation value. Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

In conclusion, the natural grassland on the site has mostly been transformed by the existing quarry pit excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem. But since the portion around the site was previously ploughed it is no longer representative of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and

Degraded area. The site and immediate surroundings do not contain any watercourses or wetlands which will be affected by the development. However, clean runoff will still have to be diverted around the site by means of a low berm. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site. Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

(b) Description of the current land uses.

The proposed mining area is located on a property where the land use is agriculture and the zoning is either agricultural or vacant/unspecified. The property is mainly used for animal grazing.

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

There was an existing mining permit for the property which was under Karibu Quarries with mining permit application number FS/30/5/1/3/2/232MP and MP26/2008. The mining permit has expired before the current landowner and applicant, WLS Trust, acquired the property. The proposed application will include the current footprint of the former mining permit. There are no channels, streams or watercourses nearby to the site.

The topography of the site is dominated by a plain with a gradual slope from west to east. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site. The existing quarry is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions.

(d) Environmental and current land use map.

(Show all environmental, and current land use features)

Refer to Map 2 and Map 3 in the ecological specialist report in appendix C. For additional information pertaining to current land use please refer to the land use locality map in appendix A where the current land use is indicated as vacant/unspecified.

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

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

Please refer to the Impact Assessment in Appendix E.

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

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

Please refer to the Impact Assessment in Appendix E

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

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

Note:

No alternative sites were identified for the project (refer to section ix for motivation)

The advantages and disadvantages of establishing the mining area on the proposed site are as follows:

* Advantages:

- The proposed area incorporates a former quarry that has not been rehabilitated thus reducing the environmental impact of this project. In addition the applicant accepts liability for the rehabilitation of the existing borrow pit thereby contributing to environmental conservation and rehabilitation.
- This proposed area is located in a position where the site is easily accessible by road.
- The establishment of the mining area on the proposed area will result in the creation of jobs for local residents. This includes direct and indirect employment opportunities.
- According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. The site in question is listed as being an Other and Degraded area according to the Free State Province Biodiversity Management Plan (2015). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey. The overall conservation value of the site is therefore relatively low.
- There are no neighbouring houses located in close proximity to the proposed mining area.
- The proposed mining area contains sufficient material for the mining activities to commence which other sites on the same property does not contain.

* Disadvantages:

- Mining activities will result in a change in land use until the site is rehabilitated. This will prevent the landowner to use the land for grazing for his animals.
 - Vegetation will be cleared over a 4.5 ha area which will lead to a loss of vegetation and loss of habitat for animals.

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

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

Several concerns were raised by surrounding neighbours of Farm De Hoop 320. To that end a meeting was held where all interested and affected parties (I&APs) were invited to attend to discuss the project and to hear and address the concerns raised by the I&APs. The minutes of the meeting are available in appendix D under the PPP process. The main concerns raised include the issue of dust, noise, security, access to the site, decrease in value of surrounding land and deterioration of the R706. The concerns were discussed in the meeting and concerns were addressed. Recommended mitigation measures, along with additional measures, have been included in this EMP below:

- Surface and groundwater quality and quantity:

- * Storm water management measures will be implemented to divert clean storm water around the mining area and to contain any "dirty water" on the operational area.
- * Comply with all conditions of the National Water Act (Act 36 of 1998)
- * Any spill of potentially hazardous substances (e.g. oil, grease, diesel, etc.) should be cleaned and the spill managed immediately.
- * Storm water mitigation measures will be implemented to ensure that clean run-off water is not contaminated by any activities related to the proposed project.
- * Water meters will be installed on boreholes on farm by applicant to accurately monitor the amount of water being used by the farm and said operations and to ensure compliance with the Water Use License for said boreholes.

- Ambient Air Quality:

- * A dust monitoring system will be implemented to monitor dust emissions from the operation.
- * If dust becomes problematic, further management of the dust must be implemented.
- * The speed of trucks and other vehicles on the access road should be limited to 40 km/hour to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.
- * A complaints register will be kept on site to log any complaints from other road users or adjacent landowners to ensure that dust levels are kept to a minimum.

- Noise Levels:

- * Machines should be equipped with silencers.
- * Machines should be maintained in a good condition to prevent excessive noise.
- * No blasting is planned for this operation as material is to be removed with the excavator.

- Waste:

- * Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be disposed and stored in a suitable container at a collecting point and collected on a regular basis and disposed of at an authorized waste disposal facility in the area. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the site.
- * Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste for general and hazardous waste.
- * Spills of any product such as paint, oil, cleaning agents etc. should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing it at a recognised facility.
- * All used oils, grease or hydraulic fluids, paints, thinners etc. that cannot be re-used shall be placed in a hazardous waste container for disposal at a suitable waste disposal facility.
- * Temporary toilet facilities must be made available on site during construction, operational and decommissioning phase.
- * Sewage from these toilets should be managed appropriately and not be disposed of on site or the surrounding environment to cause water or other pollution.

- Loss of Vegetation:

- * It is not anticipated that the vegetation on adjacent property will be influenced due to the proposed mining activities as these activities will be carried out on a specific site (i.e. the mining area).

- * No open fires will be allowed on site as the site will be treated as a fire-free zone to protect the loss of vegetation.
 - * A permit must be obtained to transplant protected / red data species to other areas where it will not be disturbed.
 - * Only areas where mining activities occur will be cleared of vegetation.
 - * The entire mining area will be rehabilitated and revegetated after mining to ensure the re-growth of vegetation.
- Loss of animals:
- * No animals will be harmed or killed on the proposed mining site.
 - * The site will be rehabilitated in such a manner to promote habitat establishment for animals on the site.
- Soil loss:
- * Topsoil, if available, will be removed and stockpiled to preserve the soil for re-use during rehabilitation.
 - * Measures will be implemented to protect topsoil stockpiles from erosion. This includes covering of the soil with vegetation and making berms at the highest part of the stockpiles to divert water around them.
 - * Topsoil stockpiles will not be made on steep slopes.
 - * Topsoil will not be sold or used for any other purposes.
- Safety:
- * No employee at the proposed mining area will be allowed to wander on adjacent land without consent from that landowner.
 - * No animals in the surrounding area to the mining area will be injured or killed.
 - * Employees at the mine will cook food and eat at home and will not be allowed to gather food from the environment surrounding the proposed mining site.
 - * Employees will be transported to and from work before and after every shift to ensure that no one trespasses on adjacent property.
 - * Only qualified personnel will be allowed to operate machinery.
 - * Machinery and vehicles will be serviced as needed to ensure safety of personnel.
 - * No employee will be permitted to stay at the mine if it is not during his shift. Employees not working, should be transported to their homes.
 - * The applicant intends to install a security system which includes cameras at the proposed quarry and at access points to the farm to improve security in the area.
- Archaeology and Palaeontology:
- * Should any artefacts be unearthed on the site the mining should cease and a specialist and the SAHRA should be contacted to investigate the finding.

Refer to the Phase 1 HIA in Appendix C

ix) Motivation where no alternative sites were considered.

The area of the proposed site has already been disturbed due to previous mining activities which occurred on it.

There is a shortage of the material in the region in terms of quantity and quality available. Dolerite is used extensively in the construction industry in the region..

The preferred site is easily accessible for the applicant to conduct mining activities.

The vegetation type is not regarded as threatened or endangered and is already degraded and transformed due to the previous quarry (refer to the ecological report in appendix C).

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

The layout of the site will be established in such a manner to indicate the locations of the excavation, mining boundaries, material stockpiles (i.e. topsoil and sand), roads, storage areas where

goods are kept. Trucks will enter the site and the material (dolerite) will be loaded onto the trucks from the stockpile area.

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.)

An impact assessment was compiled for the impacts which may occur on the site. During the operation on site, risk assessments and further impact assessments will be carried out to identify, assess and rank the impacts and risks that the activity will have on the environment.

The impacts identified were the following:

- Impact on geology and soil:

Loss of sand and topsoil as a result of erosion. The topsoil will be removed and kept at a designated location on site and will be used exclusively for rehabilitation purposes.

There will be a definite impact on the geology as the material being removed is dolerite which is a type of rock.

Dolerite is an igneous rock (i.e. an intrusive) and is not host to any palaeontological or heritage artefacts. In addition, dolerite is a relatively common rock type in the region.

- Land use and capability:

Land cannot be used for grazing when mining activities occur.

- Loss/damage of flora and fauna:

Vegetation will be removed and the habitat of certain animal species on site will be damaged.

Animals might be injured or killed on the site as a result of the movement of vehicles.

- Impact on surface- and groundwater:

Spillages of hazardous waste, littering or effluent spills may cause contamination of surface water and/or groundwater.

- Air quality:

Dust generation may cause higher dust levels in the area which will pollute the area and may affect crops and livestock. This may be experienced at the mining area and gravel access roads used to transport the dolerite.

- Noise levels:

Excavation and loading and hauling of dolerite will have an impact on the ambient noise levels.

- Aesthetics:

Although the landscape will be altered and mining activities will occur which is not associated with the surrounding land use (i.e. agriculture) the site will not be visible from any public road or neighbouring houses.

- Impact on cultural and heritage resources/sites:

There may be an impact on artefacts on the uncovering thereof. It is however not expected that there are any artefacts of archaeological significance.

- Socio-economic conditions:

There will be a positive impact on the socio-economic condition of the residents of the area with more employment opportunities created.

(ii) Extent to which the risks/impacts can be avoided or minimized by mitigation measures:

-Impact on soil and geology:

Topsoil loss can be avoided if soil is stockpiled and managed correctly to avoid erosion on the site. If topsoil is stockpiled and not used for other purposes, the impact can be avoided.

- Land use and capability:

The land use of the mining area will change and grazing of animals will not be possible on large areas of the site. However, the impact will be temporary as the site will be rehabilitated to the original land use (i.e. agriculture) at the end of the project. It should also be noted that the areas surrounding the proposed site, especially areas in the centre of the site, was disturbed by previous mining activities.

- Loss/damage of flora and fauna:

Vegetation will be lost during the clearing of the site. However, the impact will be temporary as the site will be revegetated during rehabilitation.

Existing animal habitats may be disturbed/damaged and animals present on site will leave the site as a result of the presence of people. It is expected that the animals will return after mining activities ceased and people and machinery left the site. New habitats will then be created.

- Impact on surface- and groundwater:

With the implementation of the correct mitigation measures and best practices for the storage and handling of hazardous substances and the maintenance of vehicles and machinery, the impact on soil- and groundwater can be avoided. After rehabilitation and the re-establishment of vegetation on the mining area this impact will be reduced significantly.

- Air quality:

It is likely that there might be dust emissions from the use of the gravel access road and from the activities on the mining area. If dust becomes a problem, dust control measures will be implemented and other road users will be consulted in this regard. A complaints register will be kept on site to log complaints received from other road users in the area.

Note. A meeting was held in regards to the issues surrounding the proposed project, see the PPP in appendix D, where dust control was specifically mentioned and addressed.

- Noise levels:

Noise will be generated at the mining site as a result of the mining activities (i.e. excavation, loading and transportation). The impact can be minimized by mitigation, but cannot be avoided. Regular servicing of vehicles and machinery and working at daytime hours will minimize the impact and possible disturbance to adjacent landowners. A speed limit will also be enforced for trucks travelling on the access road.

- Aesthetics:

The mining area will not be visible to houses of adjacent landowners or any person using a public road and will therefore not have a significant negative aesthetic impact on adjacent landowners. It is expected that trucks using the gravel access road will have an aesthetic impact on neighbours by passing the neighbouring properties. It must be ensured that transportation vehicles comply to speed limits and reduce noise when using the road to minimise this impact.

- Impact on cultural and heritage resources/sites:

It is not expected that there will be any impact on the cultural or historic sites/artefacts as no sites were identified. Impacts on any possible artefacts can be avoided if they are identified early enough. Should any artefacts be uncovered the mining should cease and a specialist and SAHRA should be contacted to investigate. Refer to the Phase 1 HIA in Appendix C.

- Socio-economic conditions:

There will be a positive impact on the socio-economic condition of the residents in the area with more job opportunities created.

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 (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc 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, etc...etc...etc.)	POTENTIAL IMPACT (Including the potential impacts for cumulative impacts) (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	SIGNIFICANCE if not mitigated	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. Modify through alternative method. Control through noise control Control through management and monitoring through rehabilitation..	SIGNIFICANCE if mitigated
Excavation of dolerite	Dust (Air Pollution), Noise, Surface disturbance, Loss of topsoil,, Loss of vegetation	Vegetation, Soil, Air	Commissioning, Operational, Rehabilitation	Medium	Noise control measures, Dust control measures, Stockpiling of topsoil, Maintenance of vehicles and machinery to prevent petrochemical spills.	Low
Loading and hauling	Soil compaction, Dust, Vegetation loss, Loss of topsoil,	Soil, Vegetation, Air	Commissioning, Operational, Rehabilitation	Medium	Vehicle maintenance, Noise control measures, Dust control measures, Maintaining and using access roads,	Low

	Noise,					
Stockpiles	Alien vegetation, Loss of topsoil, Erosion, Soil contamination, dust emissions	Soil, Air	Commissioning, Operational, Rehabilitation	Medium	Stockpiling of topsoil in the correct manner, Erosion control measures (i.e. berms and trenches), Control and removal of alien species, Cleaning and prevention of all spills on stockpiles	Low
Ablution facilities	Ground- and surface water contamination, Soil contamination,	Soil, Water	Commissioning, Operational, Rehabilitation	Medium	Establishment and management of temporary chemical toilets	Low

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

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 report and wetland delineation	<p>Scattered specimens of the protected geophyte, <i>Brunsvigia radulosa</i>, occur along the fringe of natural grassland along the southern border of the site. (Appendix C):</p> <ul style="list-style-type: none"> ▪Permits should be obtained and affected specimens transplanted to adjacent areas where they will remain unaffected. ▪The species is deciduous and will only be visible after sufficient summer rains. It is a geophyte with a subterranean tuber which should be taken into consideration when transplanting specimens. <p>Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.</p> <p>The hunting, capturing or trapping of fauna, including mammals, reptiles, birds and amphibians, on the site should be strictly prohibited during operation of the quarry.</p> <p>Adequate monitoring of weed establishment and their continued eradication must be maintained (Appendix B). Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No.</p>	X	

	<p>43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.</p> <ul style="list-style-type: none"> •Monitoring of mining operations including weed establishment and erosion should take place. <p>Rehabilitation of the mining area should be adequate and should include the following:</p> <ul style="list-style-type: none"> ▪Overburden and tailings resulting from the mining operations should be returned to excavations in order to aid in re-establishing a more natural topography. ▪The topography of the site should be re-instated as far as possible. ▪Eradication and monitoring of weed establishment should take place and should be extended after cessation of mining. ▪Topsoil should be removed prior to mining where still present, protected from wind erosion and weed establishment and replaced on the site during rehabilitation. ▪Adequate monitoring of rehabilitation success should be done and remedial action taken where required. ▪After mining has ceased all manmade materials should be removed from the site, i.e. structures, concrete, waste, etc. 		
Heritage Impact Assessment	Still to be conducted	X	

Attach copies of Specialist Reports as appendices

l) Environmental impact statement

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

The correct storage and handling of hazardous substances and hazardous waste is very important as this will limit the contamination of soil, surface and groundwater.

It is very important to manage topsoil stockpiles and cleared areas appropriately and to implement berms and trenches to limit erosion.

Storm water will be diverted around the operational areas to drain into the natural drainage lines while storm water on the operational area will be contained and measures will be implemented to reduce the runoff velocity of this water to reduce sedimentation and erosion.

Alien vegetation should be managed appropriately by removing all alien species as soon as they are recorded.

Dust control is important to limit the impact of dust on surrounding neighbours, especially along the access road that is proposed.

(ii) Final Site Map

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

Refer to Appendix A.

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

The advantages and disadvantages of establishing the mine on the proposed area are as follows:

*** Advantages:**

- The establishment of the mine on the proposed area will result in the creation of jobs for local residents.
- The area surrounding the proposed site has been previously disturbed by mining activities.
- There are no residents residing in close proximity to the proposed mining area.
- The proposed mining area contains the mineral (i.e. dolerite) to be mined. There are no more areas on the properties where the mineral is available.

*** Disadvantages:**

- Mining activities will result in a change in land use until the site is rehabilitated. This will prevent the landowner to use the land for grazing for their animals.

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.

Surface and groundwater quality and quantity:

- * Storm water management measures will be implemented to divert clean storm water around the site and to contain dirty water on the operational area. .
- * Comply with all conditions of the National Water Act 36 of 1998 (NWA).
- * Any spill of potentially hazardous substances (e.g. oil, grease, diesel, etc.) should be cleaned and the spill managed immediately.
- * Storm water mitigation measures will be implemented to ensure that clean run-off water is not contaminated by any activities related to the proposed project.

- Ambient Air Quality:

- * A dust monitoring system will be implemented to monitor dust emissions from the operation and the access road.
- * A complaints register will be kept on site to log all complaints received.
- * If dust becomes problematic, further management of the dust must be implemented.
- * The speed of trucks and other vehicles on the access road should be limited to 40 km/hour to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.

- Noise Levels:

- * Vehicles should be equipped with silencers.
- * Vehicles should be maintained in a road worthy condition.
- * No work that may increase noise levels, will be done after normal working hours.

- Waste:

- * Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., shall be disposed and stored in a suitable container at a collecting point and collected on a regular basis and disposed of at an authorized waste disposal facility in the area. Specific precautions shall be taken to prevent refuse from being dumped on or in the vicinity of the site.
- * Suitable covered receptacles shall be available at all times and conveniently placed for the disposal of waste for general and hazardous waste.
- * Spills of any product such as paint, oil, cleaning agents etc. should be cleaned up immediately by removing the spillage together with the polluted soil and by disposing it at a recognised facility.
- * All used oils, grease or hydraulic fluids, paints, thinners etc. that cannot be re-used shall be placed in a hazardous waste container for disposal at a suitable waste disposal facility.
- * Temporary toilet facilities must be made available on site during construction, operational and decommissioning phase.
- * Sewage from these toilets should be managed appropriately and not be disposed of on site or the surrounding environment to cause water or other pollution.

- Loss of vegetation:

- * It is not anticipated that the vegetation on adjacent property will be influenced due to the proposed mining activities as these activities will be carried out on a specific site.
- * In addition, no open fires will be allowed on site as the site will be treated as a fire-free zone.
- * If necessary a permit must be obtained to transplant protected / red data species to other areas where it will not be disturbed. However, no endangered species were recorded on the site according to the ecological report.

- Loss of fauna:

- * No animals will be harmed and/or killed on the site.
- * Animals will not be hunted for food on the mining area and the surrounding environment by employees on the mining areas.

- Soil loss

- * Topsoil will be removed and stockpiled to preserve the soil for re-use during rehabilitation. Topsoil stockpiles will be maintained and storm water will be diverted around the stockpiles. Stockpiles will not be made on very steep areas to prevent erosion and loss of the topsoil.
- * Topsoil will not be used for filling or any other purposes apart from rehabilitation of the area..

- Safety:

- * No employee at the proposed quarry will be allowed to wander on adjacent land to the mining area.

- * Employees at the mine will cook food at home and will not be allowed to gather food from the environment surrounding the proposed mining site.
- * Employees will be transported to and from work before and after every shift to ensure that no one trespasses on adjacent property.
- * No employee will be permitted to stay at the mining area if it is not during his shift. Employees not working, should be transported to their homes in town.
- * Vehicles and machinery will be maintained to ensure safety of all persons and animals on site.
- * Only access roads will be used by vehicles to prevent accidents.
 - * Warning signs will be placed on the site and employees will wear the Personal Protective Equipment to ensure visibility.

n) Aspects for inclusion as conditions of Authorisation.

Any aspects which must be made conditions of the Environmental Authorisation

- Indigenous vegetation, if present on site, will be protected at all costs. No indigenous vegetation will be removed if it is not necessary,
- If any artefacts are uncovered which might have an archaeological or palaeontological significance the mining operation should cease and a specialist and SAHRA should be notified to conduct the necessary studies.
 - Previous mining areas will be rehabilitated and closure applications for these areas will be submitted to the DMR.

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

(Which relate to the assessment and mitigation measures proposed)

No assumptions, uncertainties and gaps in knowledge.

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

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

The proposed activity should be authorized due to the following reasons:

- The surrounding areas of the proposed site has been disturbed by previous mining activities and the ecological status of the site is not very high,
- The mining will provide individuals from the local community with direct and indirect jobs and an income.
- The mining of dolerite in the area will create a lower price of product to be used by local residents.
 - The mining area is easily accessible for employees and transportation vehicles.

ii) Conditions that must be included in the authorisation

- People from the local community must be employed at the mine.
- Dust control measures must be strictly enforced to mitigate the impact on surrounding neighbours, especially along the access road.
- The recommendations outlined in the ecological assessment and heritage assessment.

q) Period for which the Environmental Authorisation is required.

The full validity of a mining permit term (i.e. 2 years) after which it will be renewed annually, for three periods each of which may not exceed one year, if sufficient material is available within the mining area.

r) Undertaking

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

I confirm that the undertaking is provided.

s) Financial Provision

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

i) Explain how the aforesaid amount was derived.

R202 500.00

The aforesaid amount was determined by the quantum calculation.

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

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

The amount will be provided for in the form of a financial guarantee given by the applicant to the DMR on their request

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 only persons directly affected by the mining of the dolerite is the landowner of the farm. However, he is aware of the impacts and has given consent for the mining to occur (the landowner is the applicant). Furthermore, there will be a positive impact on local residents in the area. Impact on the local residents are the following:

-Positive:

Local residents will be employed at the mine. They will earn an income for their services. Furthermore, there will be an indirect positive impact on businesses and local residents as the dolerite is used extensively in the construction industry.

construction and development.

-Negative:

The adjacent landowners may be impacted on by higher noise levels from the operation and also higher dust emissions from transportation vehicles using the gravel access road.

There might be a safety risk for adjacent landowners with more people in the area.

**Note: Please refer to the minutes of the public meeting held which is obtained in the PPP in appendix D.

(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)(j)(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).

A phase 1 HIA is still to be conducted.

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 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**).

Refer to the motivation in Section a.3.h.1 of this report.

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).

Details included in Part A, Section 1(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).

Details included in Part A, Section 1(h).

c) **Composite Map**

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

Relevant maps are attached in Appendix A

- 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 site will be rehabilitated to fit the end landuse as determined by the landowner. The land was used for agricultural purposes, in particular the grazing of livestock.

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

The applicant already has a water use license for the farm in question and intends to make use of a part of that allocated water for dust suppression on site. The exact volumes to be used are site specific and depend on the amount of dust generated on a day-by-day basis. The volumes used will only be a fraction of the total amount of allocated water indicated in the water use license.

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

iv) Impacts to be mitigated in their respective phases

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

ACTIVITIES	PHASE	SIZE AND SCALE of disturbance	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
<p>(E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc</p> <p>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, etc...etc...etc.)</p>	<p>(of operation in which activity will take place.</p> <p>State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>(volumes, tonnages and hectares or m²)</p>	<p>(describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>(A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>	<p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>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.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
<p>Site Establishment activities (i.e. fencing) and site cleanace</p>	<p>Planning and design, Pre-mining and Operational Phase</p>	<p>Approximately 4.49ha</p>	<p>Refer to the Risk Assessment in Appendix 5.</p>	<p>Work and activities will be done in accordance with all authorisations (Environmental Authorisation and Mining Permit) and the conditions contained therein.</p> <p>Furthermore, activities will also be conducted in terms of legislation (i.e. NWA, NWMA, OHSA, MPRDA)</p>	<p>Planning and operation</p>
<p>Excavation and loading of material</p>	<p>Operational phase</p>	<p>4.49ha</p>	<p>Refer to the Risk Assessment in Appendix 5.</p>	<p>Work and activities will be done in accordance with all authorisations (Environmental Authorisation and Mining</p>	<p>Operational phase</p>

				Permit) and the conditions contained therein. Furthermore, activities will also be conducted in terms of legislation (i.e. NWA, NWMA, OHSA, MPRDA)	
Waste Disposal and Material storage	Operational	0.1ha	Refer to the Risk Assessment in Appendix 5.	It is not expected that waste will be produced on the site due to the scale of the operation. However, waste will be managed according to the principles of the NEM: WA and NWA.	Operational phase
Removal of infrastructure and equipment	Rehabilitation and closure	Affected areas	Refer to the Risk Assessment in Appendix 5.	These activities will be undertaken in accordance with the EMP and closure plan.	Decommissioning and Rehabilitation
Rehabilitation (i.e. shaping, re-vegetation, etc.)	Rehabilitation	4.5ha	Refer to the Risk Assessment in Appendix 5.	Rehabilitation will be carried out in accordance with the rehabilitation plan and EMP and according to the end land-use as specified by the landowner. Specialist studies will also be studied to determine the vegetation to be re-established.	Rehabilitation

e) Impact Management Outcomes

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

ACTIVITY (whether listed or not listed). (E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).	POTENTIAL IMPACT (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)	ASPECTS AFFECTED	PHASE In which impact is anticipated (e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)	MITIGATION TYPE (modify, remedy, control, or stop) through (e.g. noise control measures, storm-water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc. etc) E.g. <ul style="list-style-type: none"> • 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 (i.e. fencing) and site cleanace	1 - Vegetation loss, 2 - Erosion - Loss of topsoil 3 - Destruction of habitat, 4 - Aesthetic impact, 5 - Noise, 6 - Dust	Vegetation, Soil, Surface water, Animal life, Land use.	Planning, Operational.	- Remedy through rehabilitation. No clearance beyond footprint. 2 - Control through management and monitoring (storm water management measures). 3 - Remedy through rehabilitation. No disturbance beyond footprint. 4 - Remedy through rehabilitation. Return to end land use. 5 - Control through noise control. 6 - Control through management and monitoring.	1 - Rehabilitation standards achieved. 2 - Limited impact. 3 - Limited impact (limited to footprint). 4 - Impact avoided. 5 - No complaints from adjacent landowners. 6 - Dust levels under the limit of 1 200 mg/m ² /day.

Excavation and loading of material	1 - Dust 2 - Noise 3 - Erosion 4 - Destruction of archaeological resources 5 - Aesthetics 6 - Storm water and drainage	1 - Air quality 2 - Ambient noise 3 - Surface water and soil 4 - Heritage resources 5 - Land use 6 - Surface water	Operational phase	1 - Control through management and monitoring. 2 - Noise control 3 - Control through management and monitoring (storm water management measures) 4 - Avoid 5 - Remedy through rehabilitation. Return to end land use 6 - Control through management and monitoring (storm water management)	1 - Dust levels under the limit of 1 200 mg/m ² /day. 2 - No complaints 3 - Limited impact 4 - Impact avoided 5 - Impact avoided 6 - Limited impact
Waste Disposal and Material storage	1 - Loss of soil 2 - Contamination of soil, surface and groundwater	1 - Soil 2 - Water, soil	Operational phase	Control through management and monitoring.	Impact avoided
Removal of infrastructure and equipment	1 - Dust 2 - Noise 3 - Soil contamination through spillage	1 - Air quality 2 - Ambient noise 3 - Soil	Decommissioning	Control through management and monitoring	Impacts avoided or limited
Rehabilitation (i.e. shaping, re-vegetation, etc.)	1 - Dust 2 - Noise 3 - Erosion Contamination through spillage	1 - Air quality 2 - Ambient noise 3 - Soil and surface water	Rehabilitation	1 - Control through management and monitoring, 2 - Control through management and monitoring 3 - Control through management and monitoring and remedy through rehabilitation	Impacts avoided or limited.

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).

<p>ACTIVITY whether listed or not listed.</p> <p>(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.).</p>	<p>POTENTIAL IMPACT</p> <p>(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc....etc...)</p>	<p>MITIGATION TYPE</p> <p>(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)</p> <p>E.g.</p> <ul style="list-style-type: none"> • Modify through alternative method. • Control through noise control • Control through management and monitoring <p>Remedy through rehabilitation..</p>	<p>TIME PERIOD FOR IMPLEMENTATION</p> <p>Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required.</p> <p>With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-..</p> <p>Upon cessation of the individual activity</p> <p>or.</p> <p>Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>	<p>COMPLIANCE WITH STANDARDS</p> <p>(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)</p>
<p>Site Establishment activities (i.e. fencing) and site clearance</p>	<p>1 - Vegetation loss, 2 - Erosion - Loss of topsoil and siltation of the river, 3 - Destruction of habitat, 4 - Aesthetic impact, 5 - Noise, 6 - Dust</p>	<p>1 - Remedy through rehabilitation. No clearance beyond footprint. 2 - Control through management and monitoring (storm water management measures). 3 - Remedy through rehabilitation. No disturbance beyond footprint.</p>	<p>Pre-excavation untill operation</p>	<p>Monitoring and measures will be done according to authorisations (RoD), all reports (BAR, EMP) and legislation (MPRDA, NEMA, NWA, Mine health and safety, NEM:BA, NEM:AQA)) and regulations published under these legislations (i.e. National Dust Control Regulations under the NEM:AQA)</p>

		<p>4 - Remedy through rehabilitation. Return to end land use.</p> <p>5 - Control through noise control.</p> <p>6 - Control through management and monitoring.</p>		
Excavation and loading of material	<p>1 - Dust</p> <p>2 - Noise</p> <p>3 - Erosion (River siltation)</p> <p>4 - Destruction of archaeological resources</p> <p>5 - Aesthetics</p> <p>6 - Storm water and drainage</p>	<p>1 - Control through management and monitoring.</p> <p>2 - Noise control</p> <p>3 - Control through management and monitoring (storm water management measures)</p> <p>4 - Avoid</p> <p>5 - Remedy through rehabilitation. Return to end land use</p> <p>6 - Control through management and monitoring (storm water management)</p>	Operation untill decommissioning	Monitoring and measures will be done according to authorisations (RoD), all reports (BAR, EMP) and legislation (MPRDA, NEMA, NWA, Mine health and safety, NEM:BA, NEM:AQA)) and regulations published under these legislations (i.e. National Dust Control Regulations under the NEM:AQA)
Removal of infrastructure and equipment	<p>1 - Dust</p> <p>2 - Noise</p> <p>3 - Soil contamination through spillage</p>	Control through management and monitoring	Decommissioning untill Rehabilitation	Activities will be conducted as stipulated in the closure plan.
Rehabilitation (i.e. shaping, re-vegetation, etc.)	<p>1 - Dust</p> <p>2 - Noise</p> <p>3 - Erosion</p> <p>Contamination through spillage</p> <p>4 - Drainage of surface wate</p>	<p>1 - Control through management and monitoring,</p> <p>2 - Control through management and monitoring</p> <p>3 - Control through management and monitoring</p>	Rehabilitation - Closure	Activities will be conducted as stipulated in the closure plan.

		and remedy through rehabilitation 4 - Remedy through rehabilitation		
Waste Disposal and Material storage	1 - Loss of soil 2 - Contamination of soil, surface and groundwater	Control through management and monitoring.	Operational until closure	Monitoring and measures will be done according to authorisations (RoD), all reports (BAR, EMP) and legislation (MPRDA, NEMA, NWA, Mine health and safety, NEM:BA, NEM:AQA)) and regulations published under these legislations (i.e. National Dust Control Regulations under the NEM:AQA)

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.

The following describes the closure objectives:

- * An area will be created which will allow for the drainage of surface water into the natural drainage patterns.
- * After closure the area will be safe in terms of health and human and animal access.
- * Establish an area which fits the end land-use (i.e. agriculture).
- * Ensure that the area is rehabilitated in such a manner to promote vegetation growth.
 - * Ensure stability of the slopes.

(b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The landowner and I&APs were consulted. The mining area will be rehabilitated to be used for agriculture (i.e. grazing), the dominant use in the surrounding area.

(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.

Refer to Appendix 1

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

The rehabilitation plan and objectives for closure indicates that the area will be used for agriculture after closure and takes into account all the impacts associated with the proposed mining activities.

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

The financial provision was calculated and included in Appendix F.

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

The applicant will provide financial guarantee of the amount as indicated in the quantum calculations.

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

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Site Establishment activities (i.e. fencing) and site clearance	Noise Dust	Visual inspection, Dust fallout, logging of complaints	Mine supervisor, appoint contractor	Once at start of project
Excavation and loading of material	Noise Dust Storage of hazardous material	Visual inspection, Dust fallout, logging of complaints	Mine supervisor, appoint contractor	Monthly dust fallout, Continuous visual assessment and complaints register updating.
Waste Disposal and Material storage	Storage and disposal of waste	Visual inspection, Dust fallout, logging of complaints	Mine supervisor, appoint contractor	Monthly dust fallout, Continuous visual assessment and complaints register updating.
Removal of infrastructure and equipment	Dust Noise	Visual inspection, Dust fallout, logging of complaints	Mine supervisor, appoint contractor	Monthly dust fallout, Continuous visual assessment and complaints register updating.
Rehabilitation	Dust Noise, Rehabilitation	Visual inspection, Dust fallout, logging of complaints	Mine supervisor, appoint contractor	Mine supervisor, appoint contractor

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

Annually

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.

Toolbox talks before any activities occur,

- Weekly meetings
- Induction given to employees with employment
- Signage

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

Once risks are identified and assessed, employees will be made aware of risks associated with the activities on site. Employees will be made aware of how to manage certain pollutants and dangerous goods, waste and effluent to minimize the risks on site.

n) Specific information required by the Competent Authority

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

An annual performance assessment will be undertaken and the financial provisions will be reviewed.

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports
- b) the inclusion of comments and inputs from stakeholders and I&APs ;
- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d) that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected. parties are correctly reflected herein.

Signature of the environmental assessment practitioner:

Name of company:

Date:

-END-

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APPENDIX A



Maps



Locality Map for the proposed mining permit application on the farm De Hoop 320/0

Applicant: WLS Trust

Date: March 2020

Site coordinates:
Lat: -29.232462°
Long: 26.007061°

Scale: 1:100 000
Spheroid: WGS 84

Environmental Consultant:
Eko Environmental
P/Bag X01, Brandhof,

Legend

- Access road
 - Orange square Quarry perimeter
 - Green square Farm De Hoop 320
 - Red star BFN
 - Black line R706
- Google Hybrid





Locality Map for the proposed mining permit application on the farm De Hoop 320/0

Applicant: WLS Trust

Date: March 2020

Site coordinates:
Lat: -29.232462°
Long: 26.007061°

Scale: 1:138 000
Spheroid: WGS 84

Environmental Consultant:
Eko Environmental
P/Bag X01, Brandhof, 9324
T: 051 444 4700
F: 086 652 5478
E: richard@ekogroup.co.za

Legend

- Access road
 - Orange square Quarry perimeter
 - Red star Bloemfontein
 - Black line FS Roads
 - Purple square Farm De hoop 320/0
- Bing Satellite





Plan Map for the proposed mining permit application on the farm De Hoop 320/0 indicating proposed infrastructure







Applicant: WLS Trust
Date: March 2020

Site coordinates:
Lat: -29.232462°
Long: 26.007061°

Scale: 1:1875
Spheroid: WGS 84

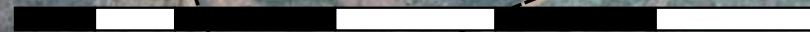
Environmental Consultant:
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F: 086 652 5478
E: richard@ekogroup.co.za

Legend

- Access road
 -  Fuel (Dang. goods)
 -  Machinery
 -  Stockpiles
 -  Previously Mined area
 -  Quarry perimeter
 -  Farm De Hoop 320
- Google Hybrid



50 0 50 100 150 200 m





Applicant: WLS Trust

Signed:

Name:

Designation

Date:

No servitudes occur on the proposed mining area, figure 1-10

Coordinates:

1	-29.2325°S	26.0060°E
2	-29.2331°S	26.0062°E
3	-29.2309°S	26.0068°E
4	-29.2311°S	26.0078°E
5	-29.2315°S	26.0083°E
6	-29.2328°S	26.0080°E
7	-29.2334°S	26.0074°E
8	-29.2334°S	26.0068°E
9	-29.2331°S	26.0062°E

Total Mining area: 4.5Ha

Scale: 1:7500

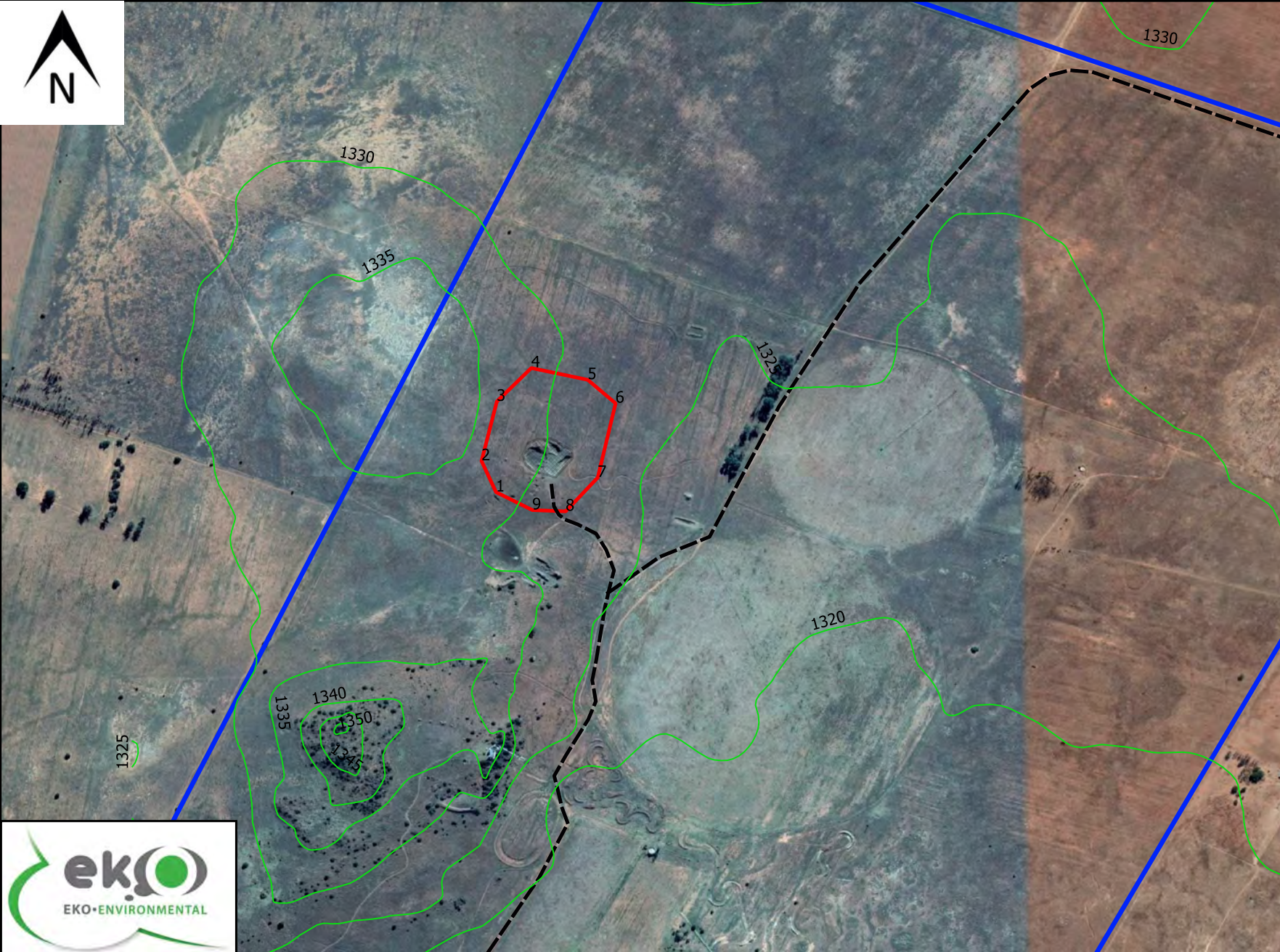
Sheroid: WGS 84

Topo Cadastre Sheet 2926AA

Legend

-  Contours
-  R706
-  Access road
-  Previously Mined area
-  Proposed Mining Area
-  De Hoop 320/0

Google Hybrid



Site map in terms of Regulation 2(2) of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 - Proposed mining area on remainder portion of Farm De Hoop 320, just south west of Bloemfontein, Free State



Locality Map for the proposed mining permit application on the farm De Hoop 320/0

Applicant: WLS Trust




Date: January 2020

Site coordinates:
Lat: -29.232462°
Long: 26.007061°

Scale: 1:30 000
Spheroid: WGS 84

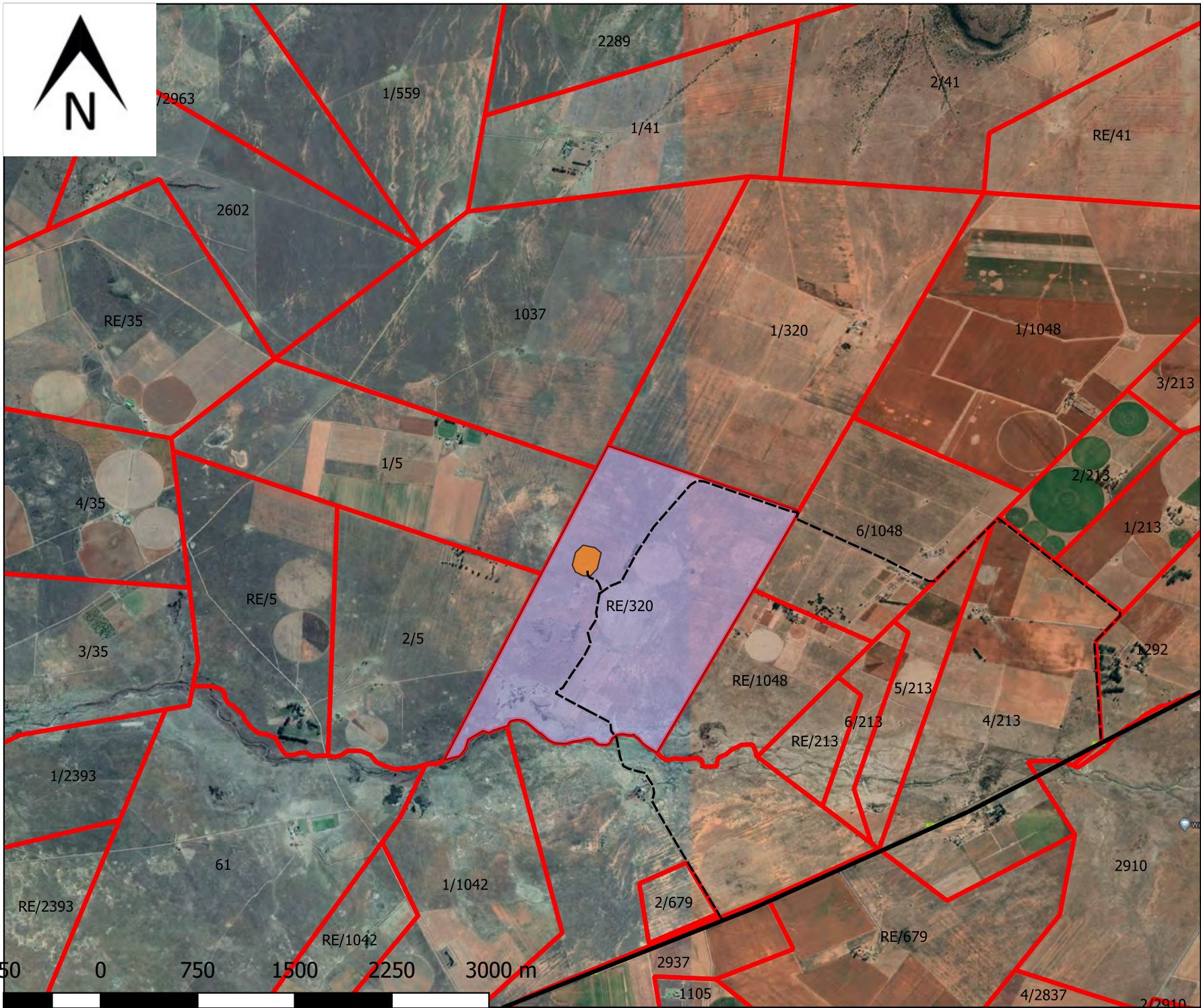
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Legend

-  R706
 -  Proposed Mining Area
 -  De Hoop 320/0
- Google Hybrid



1 0 1 2 3 4 km



Locality Map for the proposed mining permit application on the farm De Hoop 320/0

Applicant: WLS Trust

Date: February 2020

Site coordinates:
 Lat: -29.232462°
 Long: 26.007061°

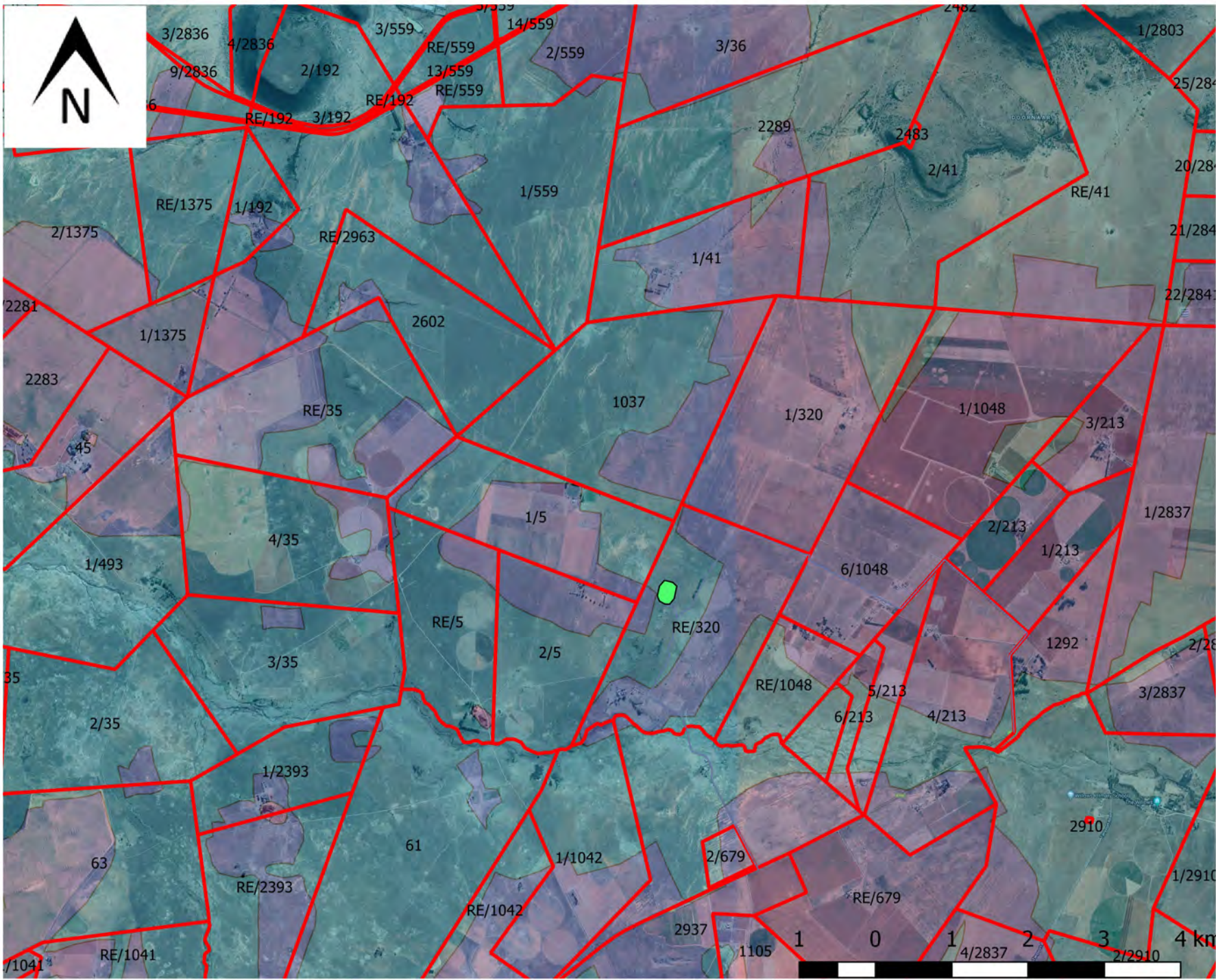
Scale: 1:30 000
 Spheroid: WGS 84

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Legend

- Access road
 - R706
 - Orange square Quarry perimeter
 - Purple square De Hoop 320/0
 - Red square Farm Portion
- Google Hybrid





Locality Map for the proposed mining permit application on the farm De Hoop 320/0

Applicant: WLS Trust

Date: February 2020

Site coordinates:
 Lat: -29.232462°
 Long: 26.007061°

Scale: 1:30 000
 Spheroid: WGS 84

Environmental Consultant:
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 E: richard@ekogroup.co.za

Legend

- Quarry perimeter
- Use**
- COMMERCIAL / INDUSTRIAL
- CONSERVATION
- CULTIVATED LAND
- FORESTRY
- MINING
- RESIDENTIAL
- SUBSTANCE FARMING
- VACANT / UNSPECIFIED



APPENDIX B



Photographic Report

	<p>A photograph taken from the centre of the proposed site towards then north east. Notice the existing pit from the old quarry that is still visible.</p>
	<p>A photograph taken from the centre of the proposed site towards then east. Notice the existing pit from the old quarry that is still visible with indigenous vegetation and cultivated lands in the background.</p>
	<p>A photograph taken from the centre of the proposed site towards then south east. Notice the existing pit from the old quarry that is still visible with indigenous vegetation and cultivated lands in the background. The access road to the site is also visible.</p>

	<p>A photograph taken from the centre of the proposed site towards then south. Notice the existing pit from the old quarry that is still visible with indigenous vegetation and cultivated lands in the background. The access road to the site is also visible.</p>
	<p>A photograph taken from the centre of the proposed site towards then south west. Notice the existing pit from the old quarry that is still visible with indigenous vegetation in the background. Notice that the topography rises towards the south west and west forming a natural barrier to the lands further in that direction.</p>
	<p>A photograph taken from the centre of the proposed site towards then west. Notice that the topography rises towards the south west and west forming a natural barrier to the lands further in that direction.</p>

	<p>A photograph taken from the centre of the proposed site towards then north west. Notice the existing pit from the old quarry that is still visible with indigenous vegetation and cultivated lands in the background. The access road to the site is also visible.</p>
	<p>A photograph taken from the centre of the proposed site towards then north. Indigenous vegetation is present</p>
	<p>A photograph from the centre of the proposed site towards the south east. Present in the photo is the current access road to the old quarry that is intended to be used for this project.</p>

APPENDIX C



Specialist Studies

Phase 1 Heritage Impact Assessment proposed new quarry on remainder portion of Farm De Hoop 230, Bloemfontein, FS Province

Report prepared for
EKO Environmental Consultants
by
Palaeo Field Services
PO Box 38806
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9330

Summary

In terms of Regulation 2(2) of the Mineral and Petroleum Resources Development Act, Act 28 of 2002, a Phase 1 Heritage Impact Assessment was carried out over a 5 ha area where planned development calls for the establishment of a quarry with a crusher and related activities on the remainder portion of the farm De Hoop 320, near Bloemfontein Free State Province. The study area is underlain by intrusive dolerite outcrop. There is no evidence for the accumulation and preservation of intact fossil material within the superficial Quaternary sediments in the immediate vicinity of the study area. The pedestrian survey indicated that impact within the demarcated area is primarily restricted to bedrock that is exclusively doleritic and therefore not palaeontologically significant. There are no palaeontological or archaeological grounds to halt the proposed development and it is considered unlikely that development will affect palaeontological or archaeological heritage resources within the demarcated permit area in the future. The site is rated Generally Protected C (GP.C).

Introduction

At the request of EKO Environmental Consultants a Phase 1 Heritage Impact Assessment was carried out over a 5 ha area where planned development calls for the establishment of a quarry with a crusher and related activities on the remainder portion of the farm De Hoop 320, near Bloemfontein Free State Province. (**Fig. 1**). 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 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 evaluated through a desktop study and carried out on the basis of existing field data, database information and published literature. This was followed by a field assessment by means of a pedestrian and vehicle survey. A Garmin Etrex Vista GPS hand model (set to the WGS 84 map datum) and a digital camera were used for recording purposes. Relevant archaeological information, aerial photographs and site records were consulted and integrated with data acquired during the on-site inspection. The study area is rated according to field rating categories as prescribed by SAHRA (**Table 1**).

Locality data

1:50 000 scale topographical map 2629 AA Bloemfontein

1:250 000 scale geological map 2624 Bloemfontein

Site Centroid Coordinates: 29°13'56.09"S 26° 0'25.56"E

The study area forms part of an old borrow pit located on the farm De Hoop 320 situated about 3 km north of the R706 road between Bloemfontein and Jagersfontein and about 25 km west south west of the Bloemfontein CBD (**Fig. 2 & 3**).

Geology

The geology of the region has been described by Nolte (1995) and Johnson (2006). The study area situated within the outcrop area of the Karoo Supergroup, which is primarily represented by late Permian, Beaufort Group (Adelaide Subgroup) sedimentary rocks, consisting of alternating sandstone and mudstone layers. These sedimentary rocks form the base on which younger, superficial deposits of Quaternary age have been deposited (Partridge *et al.* 2006). Superficial sediments consist mainly of well-developed, residual soils and alluvial deposits near river drainages. Dykes and sills of resistant Jurassic dolerite intrusions are present in the region.

Background

The local palaeontological footprint is primarily represented by Late Permian Karoo vertebrate fauna and Late Cenozoic (Quaternary Period, comprising the Pleistocene and Holocene Epochs) mammalian fossils. The Karoo geological strata within the affected area are assigned to the *Dicynodon* Assemblage Zone (AZ) (**Fig. 4**). Therapsids from this biozone occur generally well-preserved in mudrock horizons and are usually found as dispersed and isolated specimens associated with an abundance of calcareous nodules (Kitching 1995). Other vertebrate fossils include fish, amphibians and amniotes. Molluscs, insects, plant (*Dadoxylon*, *Glossopteris*) and trace fossils (arthropod trails, worm burrows) are also occur in the biozone.

A number of palaeontological localities, such as the ones at Erfkroon and Mitasrust, have been found eroding out of Pleistocene alluvial terraces and dongas along the Modder River near Bloemfontein. The river's fossil-bearing potential has been known for almost 150 years, with a frontlet and horn cores of *Syncerus qntiquus* recovered as far back as 1839 (Cooke 1955) and the remains of *Megalotragus priscus* discovered around the turn of the previous century (Broom 1909). The upper calcretized layers of the Florisian fossil locality at Erfkroon, which is located 60 kilometers west and downstream from Avenmore on the northern bank of the Modder River presumably represent palaeosols formed under semi-arid to arid conditions with ages ranging between 25 000 and 113 000 years ago (Churchill *et al.* 2000).

The Stone Age archaeological record around Bloemfontein spans back to the early Middle Stone Age. Prehistoric archaeological remains previously recorded in the region include stone tools and mammal fossil remains from sealed and or exposed contexts. Along much of the course of Modder River and its tributaries north of Bloemfontein, alluvial deposits contain numerous occurrences of *in situ* Middle and Later Stone Age material eroding out of the overbank sediments where they are often found in association large mammal fossil remains (Churchill *et al.* 2000; Rossouw 1999, 2000, 2006). The incidence of surface scatters usually decreases away from localized areas such as alluvial contexts and dolerite-shale contact

zones when stone tools largely occur as contextually derived individual finds in the open veld. Widespread traces of prehistoric human habitation, in the form of stone tool scatters and individual surface finds, have previously been recorded at Bayswater 286, Lilyvale 2313 and Hillandale 249 (Goodwin and Van Riet Lowe 1929, Henderson et al. 2008; Rossouw 2012). There is no record of Later Iron Age settlements in the immediate area around Bloemfontein (Maggs 1976).

The cultural significance of the landscape west of Bloemfontein is primarily represented by the historical footprint left behind by early colonial settlers, when several farms, including Bains Vlei and Kwaggafontein, the latter located immediately northeast of De Hoop farm, was owned by Andrew Hudson Bain who settled in the Free State in 1847 (Collins 1965). In 1860 and 1862 two hunts, organized for the second son of Queen Elizabeth and for the Barolong tribe respectively, took place at Bains Vlei which led to the mass killing of thousands of antelope and a subsequent dwindling of large antelope herds in the Bloemfontein area.

The British march on Bloemfontein from the west, passed the Rooidam area on the 12th of March 1900 (**Fig. 5**). After Bloemfontein was occupied by British forces on 13 March the city became a major military centre, with several farms north of Bloemfontein requisitioned for military purposes which also included military hospitals, rifle ranges, sangars and a large remount camp at Hillandale. Hillandale was owned by Abraham Fischer, and was expropriated by the British along with the Tempe farms.

Field Assessment and Recommendations

The development footprint is underlain by palaeontologically insignificant dolerite intrusions that are buffered by well-developed superficial deposits considered to be of low to very low palaeontological sensitivity (**Fig. 6 & 7**). As far as the overall palaeontological heritage is concerned, likelihood of palaeontological impact resulting from this development is considered non-existent.

There is no above-ground evidence of building structures older than 60 years, Stone Age archaeological remains, graves or material of cultural significance within the confines of the development footprint. As far as the archaeological heritage is concerned, the proposed development is considered to be of low archaeological significance and is assigned a site rating of Generally Protected C (**Table 1**).

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AUTHOR DETAILS

Dr. Lloyd Rossouw specializes in the southern African Quaternary and has over twenty years of extensive fieldwork experience. He graduated with Archaeology and Cultural Anthropology for his BA degree and went on to receive training in southern African archaeology at Honors level at the University of Stellenbosch's Archaeology Department. He received specialized training in faunal osteology and Quaternary palaeontology for his MSc-degree at the Bernard Price Institute of Palaeontology (Wits) and obtained his PhD-degree at the University of the Free State, specializing in plant microfossil research. He is a member of the Association for Southern African Professional Archaeologists (ASAPA) and the Palaeontological Society of Southern Africa (PSSA).

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. I have no interest in secondary or downstream developments as a result of the authorization of this project.

A handwritten signature in black ink, appearing to read 'L Rossouw', written in a cursive style.

20 / 11 / 2020

Tables and Figures

Table 1. Field rating categories as prescribed by SAHRA.

Field Rating	Grade	Significance	Mitigation
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	Grade 3A	High significance	Conservation; 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

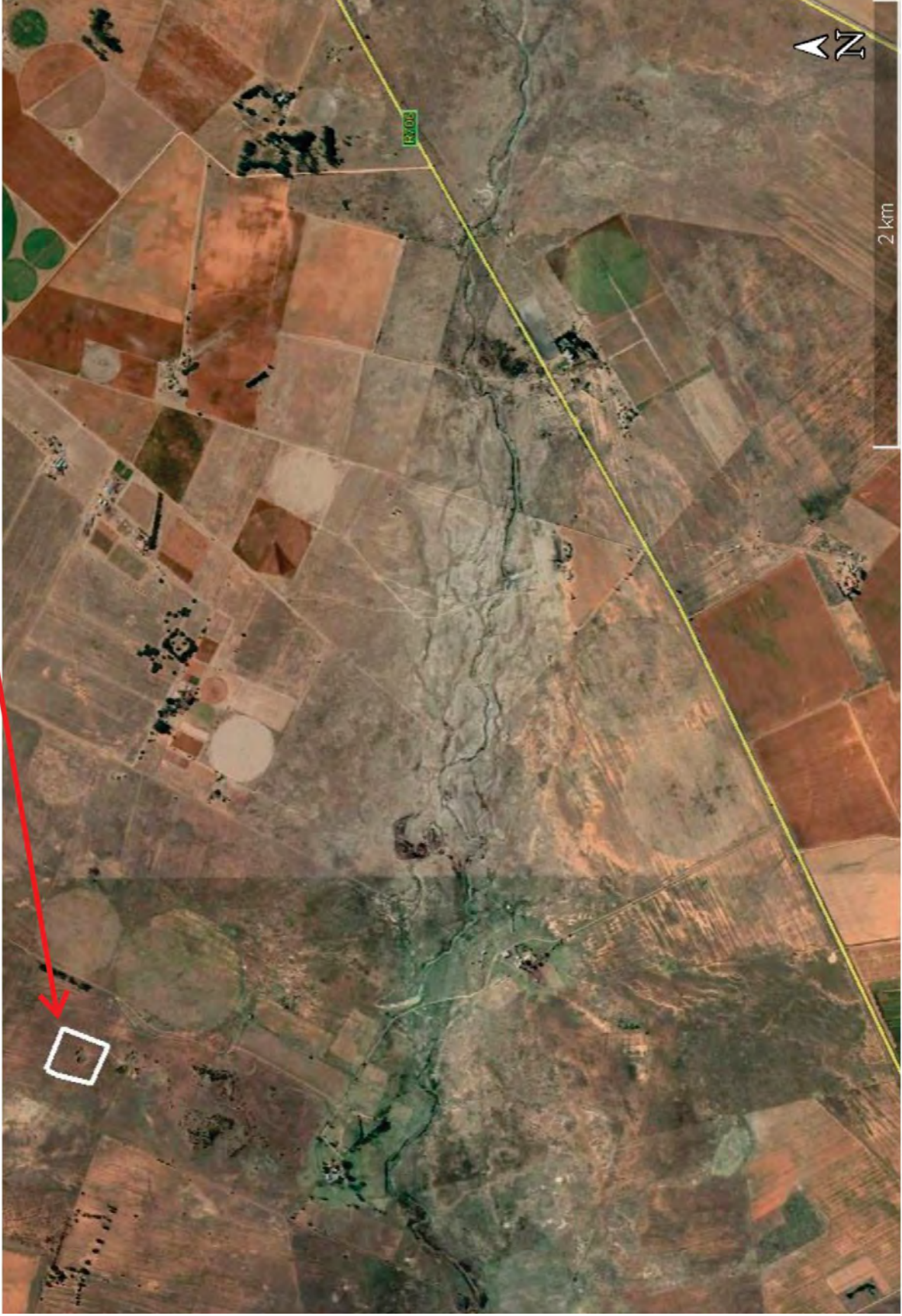


Figure 1. Aerial view the proposed new quarry on the remainder portion of the farm De Hoop 320 (source 1:50 000 scale topographical map 2926 AA Bloemfontein).

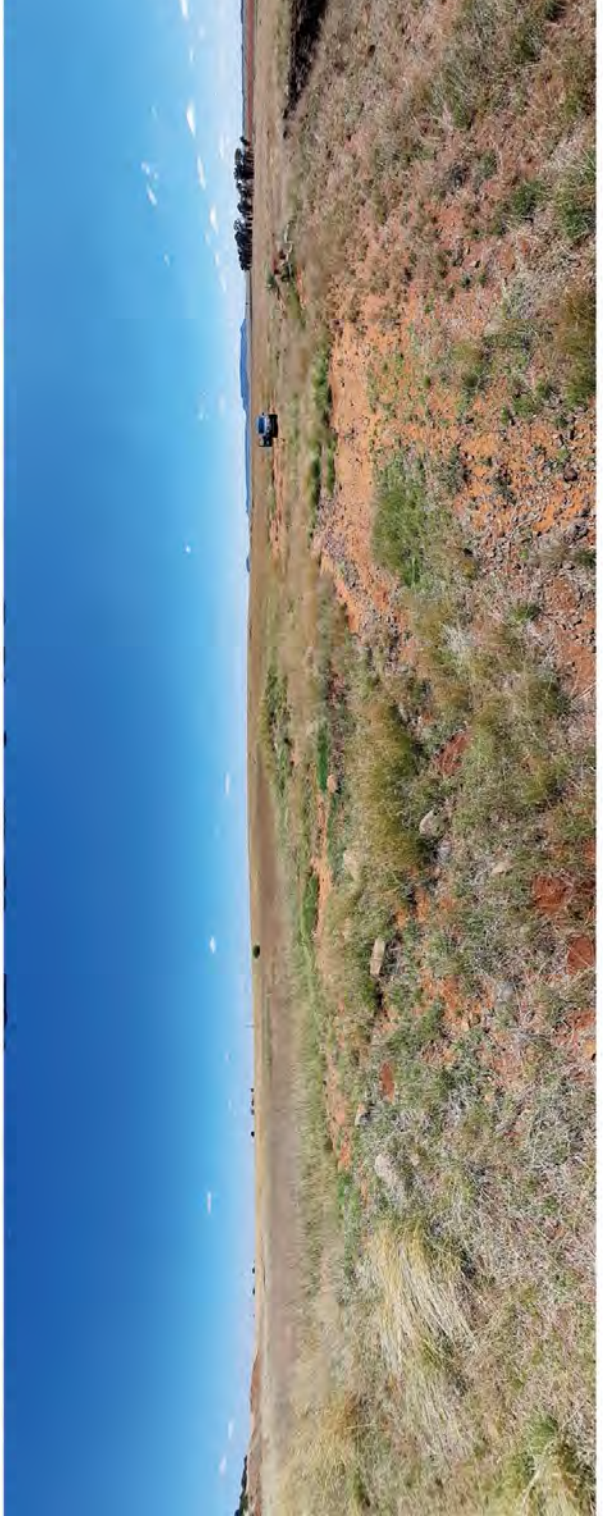


Figure 2. General view of the site looking at old borrow pit, direction north.



Figure 3. Aerial view of the study area.

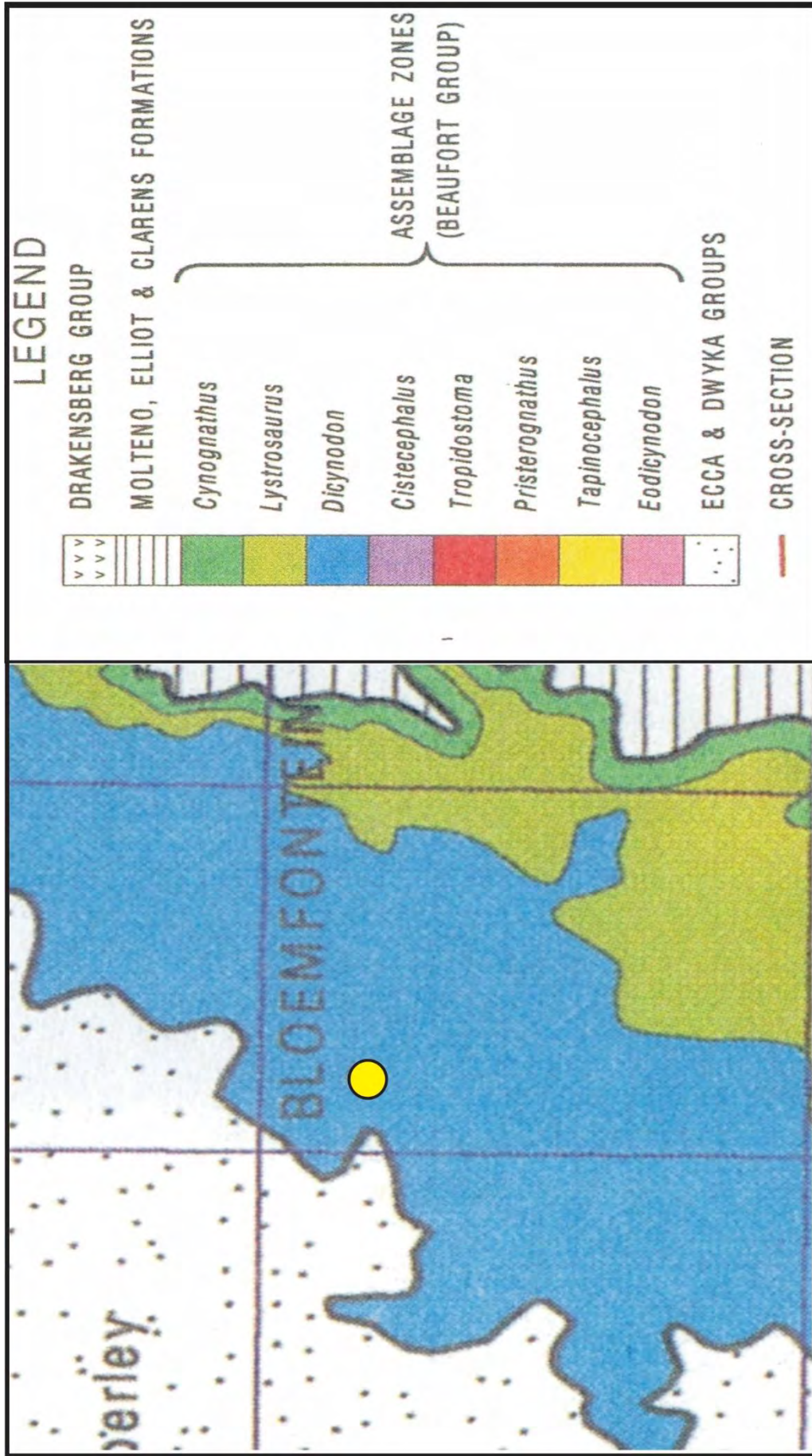


Figure 4. The sedimentary strata underlying the Bloemfontein area are assigned to the *Dicynodon* Assemblage Zone. (Map = distribution of vertebrate biozones of the Beaufort Group after Rubidge 1995.)

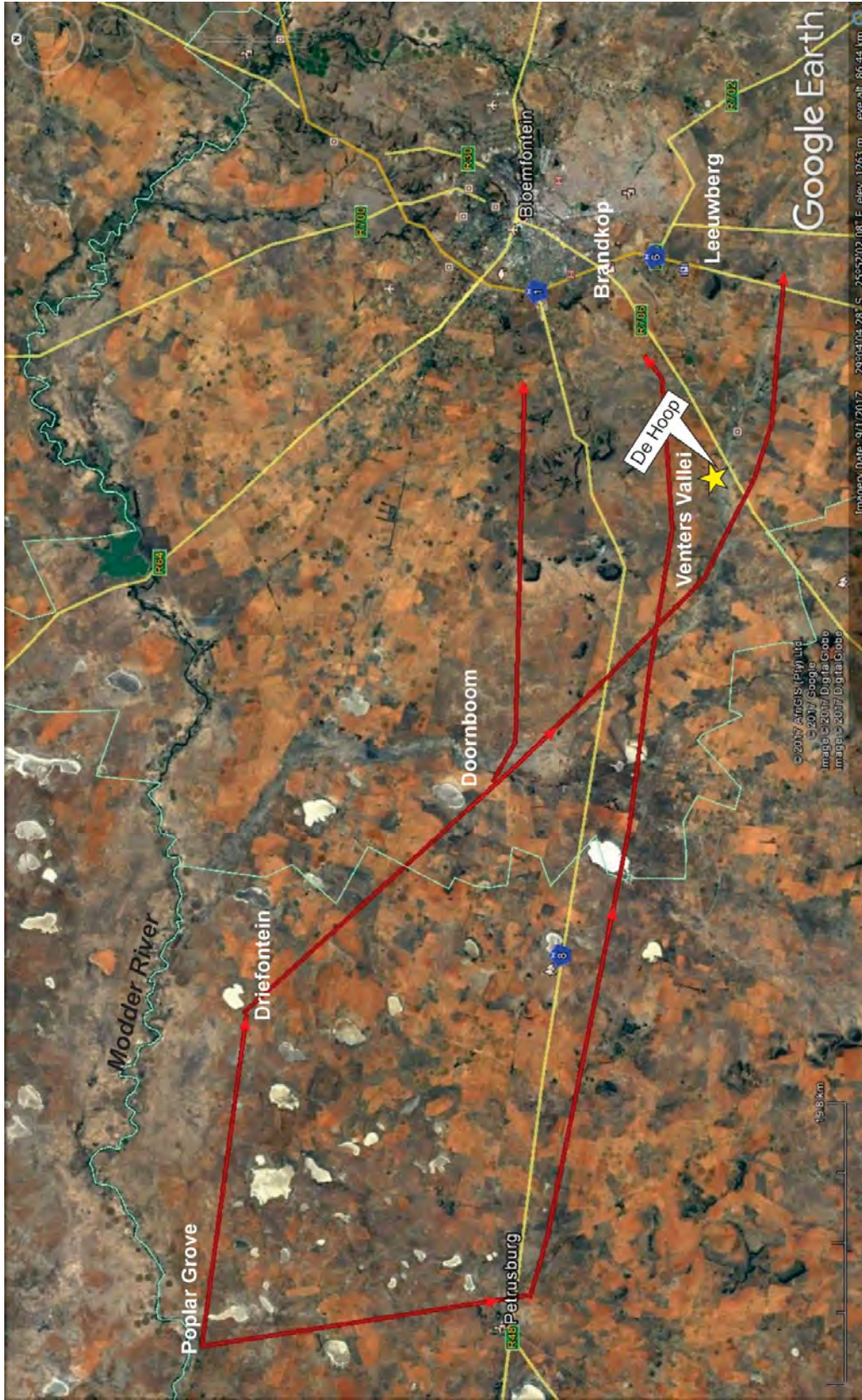


Figure 5. British march on Bloemfontein, March 1900. The position of Rooidam is indicated by the yellow star. According to Amery (1905) “On the morning of the 12th, French pushed on to Venter’s Vallei. Here Roberts joined him, and directed him, to turn in to the north-east and make a dash for Brand Kop. At 1 P.M. French brought the column a mile west of Ferreira Siding, nearly 30 miles from the bivouac at Doornboom. A detachment was sent to the right to cut the railway at Leeuwberg. French himself at once hurried forward towards Brand Kop with the mounted troops, leaving the weary batteries to crawl on after as best they could. The Boers were soon found in positions on both sides of the railway. French, who was with the reconnoitring line, ordered Major Allenby, with the advanced guard squadron of the Greys, to seize a ridge 2,000 yards south of the Brand Kop.”

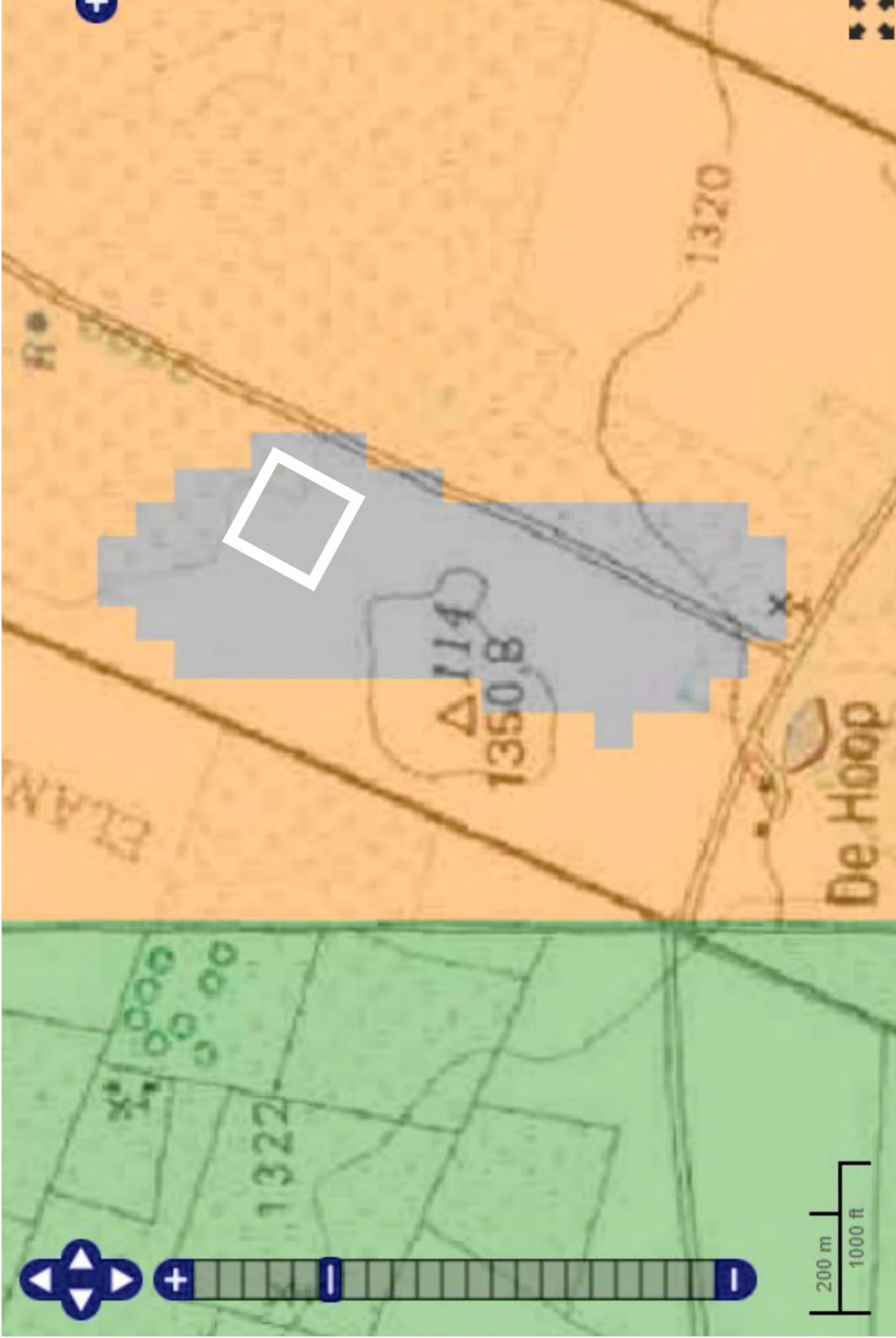


Figure 6. Position of the study area (white polygon) marked on the SAHRIS Palaeontological Sensitivity Map: Grey Zone = insignificant, no further palaeontological studies required.



Figure 7. The entire study area is underlain by intrusive dolerite outcrop (above) that are capped in places by well-developed superficial deposits (below). (scale: 1 = 10 cm).



DPR

Ecologists & Environmental Services

Report on the ecological assessment for the proposed quarry on the Remainder of the Farm De Hoop 320, Bloemfontein, Free State Province.

March 2020

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DECLARATION OF INDEPENDENCE

DPR Ecologists and Environmental Services is an independent company and has no financial, personal or other interest in the proposed project, apart from fair remuneration for work performed in the delivery of ecological services. There are no circumstances that compromise the objectivity of the study.

Report Version	Final 1.0		
Title	Report on the ecological assessment for the proposed quarry on the Remainder of the Farm De Hoop 320, Bloemfontein, Free State Province.		
Author	DP van Rensburg (Pr.Sci.Nat)		Mar'20

Executive Summary

The proposed quarry is located on the Remainder of the Farm De Hoop 320 which is situated to the south west of the city of Bloemfontein (approximately 19 km). The proposed site already contains a historical borrow pit although the surroundings consist of natural grassland into which the quarry will be expanded. Although natural grassland is still present it is clear that the area has been subjected to significant transformation by previous land uses. The extent of the site is approximately 5 hectares (Map 1). No watercourses or wetlands could be identified on or near the proposed site.

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004) (Map 2). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. The site in question is listed as being an Other and Degraded area according to the Free State Province Biodiversity Management Plan (2015) (Map 3). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey. The overall conservation value of the site is therefore relatively low.

The topography of the site is dominated by a plain with a gradual slope from west to east. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site (approximately 1.5 km) (Map 2). The existing borrow pit is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

No elements of high conservation value or sensitivity occur on the site footprint itself although the few specimens of protected *Brunsvigia radulosa* still has some conservation value (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

In conclusion, the natural grassland on the site has mostly been transformed by the existing borrow pit excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem (Map 2). But since the portion around the site was previously ploughed it is no longer representative of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3). The site and immediate surroundings do not contain any watercourses or wetlands which will be affected by the development (Map 1 & 2). However, clean runoff will still have to be diverted around the site by means of a low berm. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

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Ecological assessment

1. INTRODUCTION

1.1 Background

Natural vegetation is an important component of ecosystems. Some of the vegetation units in a region can be more sensitive than others, usually as a result of a variety of environmental factors and species composition. These units are often associated with water bodies, water transferring bodies or moisture sinks. These systems are always connected to each other through a complex pattern. Degradation of a link in this larger system, e.g. tributary, pan, wetland, usually leads to the degradation of the larger system. Therefore, degradation of such a water related system should be prevented.

Though vegetation may seem to be uniform and low in diversity it may still contain species that are rare and endangered. The occurrence of such a species may render the development unviable. Should such a species be encountered the development should be moved to another location or cease altogether.

South Africa has a large amount of endemic species and in terms of plant diversity ranks third in the world. This has the result that many of the species are rare, highly localised and consequently endangered. It is our duty to protect our diverse natural resources.

South Africa's water resources have become a major concern in recent times. As a water scarce country, we need to manage our water resources sustainably in order to maintain a viable resource for the community as well as to preserve the biodiversity of the system. Thus, it should be clear that we need to protect our water resources so that we may be able to utilise this renewable resource sustainably. Areas that are regarded as crucial to maintain healthy water resources include wetlands, streams as well as the overall catchment of a river system.

It is well known that quarry mining operations has several detrimental impacts on the environment. These impacts are numerous but the most pronounced impacts are associated with the excavation of large amounts of earth materials, the storage and disposal thereof and the sedimentation associated with it, especially where mining takes place near watercourses. This usually causes degradation of waterways due to sedimentation as well as the transformation of the vegetation and ecosystem on the site.

The proposed quarry is located on the Remainder of the Farm De Hoop 320 which is situated to the south west of the city of Bloemfontein (approximately 19 km). The proposed site already contains a historical borrow pit although the surroundings consist of natural grassland into which the quarry will be expanded. Although natural grassland is still present it is clear that the area has been subjected to significant transformation by previous land uses. The extent of the site is approximately 5 hectares (Map 1). No watercourses or wetlands could be identified on or near the proposed site.

A site visit was conducted on 25 February 2020. The entire footprint of the site was surveyed. The site survey was conducted during summer after sufficient rains and the plant identification on the site was considered optimal.

For the above reasons it is necessary to conduct an ecological assessment of an area proposed for development.

The report together with its recommendations and mitigation measures should be used to minimise the impact of the proposed development.

1.2 The value of biodiversity

The diversity of life forms and their interaction with each other and the environment has made Earth a uniquely habitable place for humans. Biodiversity sustains human livelihoods and life itself. Although our dependence on biodiversity has become less tangible and apparent, it remains critically important.

The balancing of atmospheric gases through photosynthesis and carbon sequestration is reliant on biodiversity, while an estimated 40% of the global economy is based on biological products and processes.

Biodiversity is the basis of innumerable environmental services that keep us and the natural environment alive. These services range from the provision of clean water and watershed services to the recycling of nutrients and pollution. These ecosystem services include:

- Soil formation and maintenance of soil fertility.
- Primary production through photosynthesis as the supportive foundation for all life.
- Provision of food, fuel and fibre.
- Provision of shelter and building materials.
- Regulation of water flows and the maintenance of water quality.
- Regulation and purification of atmospheric gases.
- Moderation of climate and weather.
- Detoxification and decomposition of wastes.
- Pollination of plants, including many crops.
- Control of pests and diseases.
- Maintenance of genetic resources.

2. SCOPE AND LIMITATIONS

- To evaluate the present state of the vegetation and ecological functioning of the area proposed for the development.
- To identify possible negative impacts that could be caused by the proposed development.

2.1 Vegetation

Aspects of the vegetation that will be assessed include:

- The vegetation types of the region with their relevance to the proposed site.
- The overall status of the vegetation on site.
- Species composition with the emphasis on dominant-, rare- and endangered species.

The amount of disturbance present on the site assessed according to:

- The amount of grazing impacts.
- Disturbance caused by human impacts.
- Other disturbances.

2.2 Fauna

Aspects of the fauna that will be assessed include:

- A basic survey of the fauna occurring in the region using visual observations of species as well as evidence of their occurrence in the region (burrows, excavations, animal tracks, etc.).
- The overall condition of the habitat.
- A list of species that may occur in the region (desktop study).

2.3 Limitations

Some geophytic or succulent species may have been overlooked due to a specific flowering time or cryptic nature.

Although a comprehensive survey of the site was done it is still likely that several species were overlooked.

Some animal species may not have been observed as a result of their nocturnal and/or shy habits.

3. METHODOLOGY

3.1 Several literature works were used for additional information.

Vegetation:

Red Data List (Raymondo *et al.* 2009)

Vegetation types (Mucina & Rutherford 2006)

Field guides used for species identification (Bromilow 1995, 2010, Coates-Palgrave 2002, Fish *et al* 2015, Gibbs-Russell *et al* 1990, Manning 2009, Pooley 1998, Retief & Meyer 2017, Van Oudtshoorn 2004, Van Wyk & Malan 1998, Van Wyk & Van Wyk 1997, Venter & Joubert 1985).

Terrestrial fauna:

Field guides for species identification (Smithers 1986a, Child *et al* 2016).

3.2 Survey

The site was assessed by means of transects and sample plots.

Noted species include rare and dominant species.

The broad vegetation types present on the site were determined.

The state of the environment was assessed in terms of condition, grazing impacts, disturbance by humans, erosion and presence of invader and exotic species.

Animal species were also noted as well as the probability of other species occurring on or near the site according to their distribution areas and habitat requirements.

The state of the habitat was also assessed.

3.3 Criteria used to assess sites

Several criteria were used to assess the site and determine the overall status of the environment.

Vegetation characteristics

Characteristics of the vegetation in its current state. The diversity of species, sensitivity of habitats and importance of the ecology as a whole.

Habitat diversity and species richness: normally a function of locality, habitat diversity and climatic conditions.

Scoring: Wide variety of species occupying a variety of niches – 1, Variety of species occupying a single niche – 2, Single species dominance over a large area containing a low diversity of species – 3.

Presence of rare and endangered species: The actual occurrence or potential occurrence of rare or endangered species on a proposed site plays a large role on the feasibility of a development. Depending on the status and provincial conservation policy, presence of a Red Data species can potentially be a fatal flaw.

Scoring: Occurrence actual or highly likely – 1, Occurrence possible – 2, Occurrence highly unlikely – 3.

Ecological function: All plant communities play a role in the ecosystem. The ecological importance of all areas though, can vary significantly e.g. wetlands, drainage lines, ecotones, etc.

Scoring: Ecological function critical for greater system – 1, Ecological function of medium importance – 2, No special ecological function (system will not fail if absent) – 3.

Degree of rarity/conservation value:

Scoring: Very rare and/or in pristine condition – 1, Fair to good condition and/or relatively rare – 2, Not rare, degraded and/or poorly conserved – 3.

Vegetation condition

The sites are compared to a benchmark site in a good to excellent condition. Vegetation management practises (e.g. grazing regime, fire, management, etc.) can have a marked impact on the condition of the vegetation.

Percentage ground cover: Ground cover is under normal and natural conditions a function of climate and biophysical characteristics. Under poor grazing management, ground cover is one of the first signs of vegetation degradation.

Scoring: Good to excellent – 1, Fair – 2, Poor – 3.

Vegetation structure: This is the ratio between tree, shrub, sub-shrubs and grass layers. The ratio could be affected by grazing and browsing by animals.

Scoring: All layers still intact and showing specimens of all age classes – 1, Sub-shrubs and/or grass layers highly grazed while tree layer still fairly intact (bush partly opened up) – 2, Mono-layered structure often dominated by a few unpalatable species (presence of barren patches notable) – 3.

Infestation with exotic weeds and invader plants or encroachers:

Scoring: No or very slight infestation levels by weeds and invaders – 1, Medium infestation by one or more species – 2, Several weed and invader species present and high occurrence of one or more species – 3.

Degree of grazing/browsing impact:

Scoring: No or very slight notable signs of browsing and/or grazing – 1, Some browse lines evident, shrubs shows signs of browsing, grass layer grazed though still intact – 2, Clear browse line on trees, shrubs heavily pruned and grass layer almost absent – 3.

Signs of erosion: The formation of erosion scars can often give an indication of the severity and/or duration of vegetation degradation.

Scoring: No or very little signs of soil erosion – 1, Small erosion gullies present and/or evidence of slight sheet erosion – 2, Gully erosion well developed (medium to large dongas) and/or sheet erosion removed the topsoil over large areas – 3.

Faunal characteristics

Presence of rare and endangered species: The actual occurrence or potential occurrence of rare or endangered species on a proposed site plays a large role on the feasibility of a development. Depending on the status and provincial conservation policy, presence of a Red Data species or very unique and sensitive habitats can potentially be a fatal flaw.

Scoring: Occurrence actual or highly likely – 1, Occurrence possible – 2, Occurrence highly unlikely.

3.4 Biodiversity sensitivity rating (BSR)

The total scores for the criteria above were used to determine the biodiversity sensitivity ranking for the sites. On a scale of 0 – 30, six different classes are described to assess the suitability of the sites to be developed. The different classes are described in the table below:

Table 1: Biodiversity sensitivity ranking

BSR	BSR general floral description	Floral score equating to BSR class
Ideal (5)	Vegetation is totally transformed or in a highly degraded state, generally has a low level of species diversity, no species of concern and/or has a high level of invasive plants. The area has lost its inherent ecological function. The area has no conservation value and potential for successful rehabilitation is very low. The site is ideal for the proposed development.	29 – 30
Preferred (4)	Vegetation is in an advanced state of degradation, has a low level of species diversity, no species of concern and/or has a high level of invasive plants. The area's ecological function is seriously hampered, has a very low conservation value and the potential for successful rehabilitation is low. The area is preferred for the proposed development.	26 – 28
Acceptable (3)	Vegetation is notably degraded, has a medium level of species diversity although no species of concern are present. Invasive plants are present but are still controllable. The area's ecological function is still intact but may be hampered by the current levels of degradation. Successful rehabilitation of the area is possible. The conservation value is regarded as low. The area is acceptable for the proposed development.	21 – 25
Not preferred (2)	The area is in a good condition although signs of disturbance are present. Species diversity is high and species of concern may be present. The ecological function is intact and very little rehabilitation is needed. The area is of medium conservation importance. The area is not preferred for the proposed development.	11 – 20
Sensitive (1)	The vegetation is in a pristine or near pristine condition. Very little signs of disturbance other than those needed for successful management are present. The species diversity is very high with several species of concern known to be present. Ecological functioning is intact and the conservation importance is high. The area is regarded as sensitive and not suitable for the proposed development.	0 - 10

4. ECOLOGICAL OVERVIEW OF THE SITE

4.1 Overview of ecology and vegetation types

Refer to the list of species encountered on the site in Appendix B.

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004) (Map 2). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type.

The Free State Province Biodiversity Management Plan (2015) has recently been published and has identified areas which are essential to meeting conservation targets for specific vegetation types, i.e. Critical Biodiversity Areas (CBA). The site in question is however listed as being an Other and Degraded area (Map 3). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey.

The proposed quarry is located on the Remainder of the Farm De Hoop 320 which is situated to the south west of the city of Bloemfontein (approximately 19 km). The proposed site already contains a historical borrow pit although the surroundings consist of natural grassland into which the quarry will be expanded. Although natural grassland is still present it is clear that the area has been subjected to significant transformation by previous land uses. The extent of the site is approximately 5 hectares (Map 1). No watercourses or wetlands could be identified on or near the proposed site.

The majority of the site has been significantly modified from the natural condition although remnants of the natural grassland is still prominent. A large portion of the site consists of a previous, historical borrow pit which leads to complete transformation of this portion both in terms of topography and vegetation. This consists of a large excavation on the site with a few small overburden and topsoil dumps and general disturbance around it. The borrow pit is largely free draining and has not formed any artificial wetland conditions. It has however completely and irreversibly transformed the vegetation in and around it. The remainder of the proposed site consists of grassland but which has clearly been ploughed previously (Figure 1). The current grass layer is therefore of secondary establishment which is also reflected in the species composition which does not reflect the natural vegetation type and is dominated by pioneer species. Due to the long time since this ploughing occurred a few climax grasses has once again become established but not to a sufficient degree to be considered representative of the natural vegetation type. Small portions of natural grassland occur along the western and southern borders of the site but is also significantly degraded due to the proximity of the previous borrow pit.



Figure 1: Aerial view of the proposed site (Google Earth 2019). Note the historical borrow pit on the site is clearly visible as well as plough furrows in the surrounding grassland which clearly indicates previous clearing of the natural vegetation.

The topography of the site is dominated by a plain with a gradual slope from west to east. A low rise is situated to the west of the site and slopes toward the east with a gentle slope. The topography on the site has however been altered significantly by the excavation caused by the previous borrow pit. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site (approximately 1.5 km) (Map 2). The site has an elevation of 1339 m along the western border, decreasing to 1334 m along the eastern border and also confirms the gradual slope of the area. The site itself does not contain any concentrated runoff patterns, wetlands or watercourses though surface runoff will still follow the natural slope.

As indicated, the site does not contain any wetlands or watercourses (Map 1 & 2). The existing borrow pit is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions. Another borrow pit is situated to the south of the site, which has formed an artificial impoundment but as it is not located near the site and is situated upslope from it, will not be relevant to the development. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

The geology of the area is dominated by dolerite. It consists of a network of dolerite sills, sheets and dykes, mainly intrusive into the Karoo Supergroup (Council for Geoscience 2016). Typical soil forms include Glenrosa and Mispah (Dingaen & Du Preez 2002). This is clearly evident within the existing excavation on the site.

The area has a mean average temperature of 16.2°C, with a maximum of 30.9°C in January and temperatures below zero common in winter (-1.6°C in July). Summer rainfall occurs mostly as thunderstorms with an average annual rainfall of 548 mm (Dingaen & Du Preez 2002).

The following description of the vegetation on the site should give a good indication of the condition of the ecology on it.

As previously discussed, the site already contains a previous borrow pit excavation. Here the vegetation has been removed and subsequent establishment of vegetation has been quite low. A few pioneer grasses have become established, including *Aristida congesta*, *Eragrostis lehmanniana*, *Aristida diffusa*, *Pogonarthria squarrosa*, *Setaria pallide-fusca*, *Enneapogon cenchroides* and *Urochloa panicoides*. Indigenous pioneer weeds are common and include *Sesamum triphyllum*, *Kyllinga alba* and *Chenopodium album*. Exotic weeds are also common with a few being considered serious invasives and include *Argemone ochroleuca*, *Datura ferox*, *Chenopodium schraderianum*, *Amaranthus viridis* and *Solanum eleagnifolium*.

The area surrounding the excavation and which will form part of the proposed site is dominated by grassland but which, due to previous ploughing, is dominated by pioneer species and the species composition is not representative of the natural vegetation type. Dominant grass species include *Pogonarthria squarrosa*, *Eragrostis lehmanniana*, *Aristida congesta*, *Heteropogon contortus*, *Elionurus muticus*, *Trichoneura grandiglumis*, *Eragrostis superba* and *Eragrostis nindensis*. These are almost all pioneer grasses common in disturbed areas and also substantiate the previous ploughing and transformation of the natural grassland on the site. Clumps of climax grasses are also present, though are not abundant and not representative of the natural condition. These include *Themeda triandra* and *Digitaria eriantha*. This indicates succession of the vegetation toward the climax condition though it is considered rather unlikely that the grassland will be able to re-instate the original species composition. Dwarf karroid shrubs are common and include *Eriocephalus ericoides*, *Selago albida*, *Melolobium candicans*, *Wahlenbergia nodosa*, *Lycium horridum* and *Amphiglossa triflora*. These are normally a natural component of the vegetation but an abundance does indicate a degraded grass layer. Several herbaceous species are also a good indicator of disturbance and a degraded grass layer and include *Kyllinga alba*, *Merremia verecunda*, *Acrotome inflata*, *Nidorella resedifolia* and *Helichrysum dregeanum*. A few scattered specimens of the exotic succulent, *Opuntia engelmannii*, occur on the site. Though an indicator of disturbance it is not abundant and the vegetation on the site, though transformed, is currently not subjected to high levels of disturbance. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

From the description of the vegetation on the site it is clear that it has mostly been transformed from the natural condition and although dominated by indigenous vegetation it is not representative of the natural vegetation type in good condition. This has significantly decreased its conservation value. No elements of high conservation value or sensitivity occur on the site footprint itself although the few specimens of protected *Brunsvigia radulosa* still has some conservation value (Appendix C).

In conclusion, the natural grassland on the site has mostly been transformed by the existing borrow pit excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem (Map 2). But since the portion around the site was previously ploughed it is no longer representative of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3). The site and immediate surroundings do not contain any watercourses or wetlands which will be affected by the development (Map 1 & 2). However, clean runoff will still have to

be diverted around the site by means of a low berm. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

4.2 Overview of terrestrial fauna (actual & possible)

Tracks and signs of mammals are common on the site but will be somewhat modified from the natural condition due to the transformed nature of the natural grassland on the site. As the grass layer is modified, so the habitat is modified and in turn the mammal population is modified. However, large areas of natural grassland occur to the west and south of the site and the mammal population will still be largely natural here. Mammal species which are rare and endangered are often habitat specific and sensitive to habitat change. It is therefore considered unlikely that such species would occur on the site. It is also considered likely that the site will also contain several other mammal species but these were not observed on the site.

Mammal observations on the site include foraging excavations of Springhare (*Pedetes capensis*), spoor of a small antelope, most likely that of the Common Duiker (*Sylvicapra grimmia*) or Steenbok (*Raphicerus campestris*), burrows of Aardvark (*Orycteropus afer*) and soil mounds of the Common mole rat (*Cryptomys hottentotus*). These species identified are all relatively widespread and common and therefore not of high conservation significance. They do however indicate a substantial mammal population in the area.

The most significant impact on mammals anticipated on the site itself is primarily concerned with the loss and fragmentation of available habitat due to the development of the quarry. Transformation of the natural vegetation on the site will result in a decrease in the population size as available habitat decreases. However, the survey has indicated that the available habitat has already been transformed to a large extent and this function would therefore already be compromised. The anticipated impact can therefore not be regarded as significant. Furthermore, large natural areas occur to the west and south of the site and any mammals on the site are likely to vacate the site into these adjacent areas should development take place.

In order to ensure no direct impact on the mammals on the site the hunting, capturing or trapping of mammals on the site should be strictly prohibited during operation of the quarry.

List of some Red Data terrestrial mammals that could occur in the region (Child *et al* 2016):

South African Hedgehog	<i>Atelerix frontalis</i>
Striped Weasel	<i>Poecilogale albinucha</i>
Small-Spotted Cat	<i>Felis nigripes</i>

It is considered unlikely that these species would occur on the site due to the degraded condition of the site.

5. ANTICIPATED IMPACTS

Anticipated impacts that the development will have is primarily concerned with the loss of habitat and species diversity.

As previously discussed, the vegetation on the site and surroundings has, for the most part, already previously been transformed by ploughing as well as the existing borrow pit excavation. Although the natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is listed as being a Vulnerable (VU) ecosystem the vegetation on the site it is no longer representative of it (Map 2). This is also confirmed by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3). Consequently the conservation value of the habitat or vegetation on the site is relatively low and the species diversity is also relatively low. As a result of the above, the loss of the vegetation and species diversity cannot be regarded as a high impact.

Due to the largely modified and transformed nature of the vegetation on the site no rare or threatened species were observed and it is considered unlikely that such a species would occur. However, a few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact. Unmitigated, the loss of this protected species is anticipated to be at least moderate and should mitigation as recommended be implemented adequately the impact should be decreased to low.

The site does not contain any watercourses, including drainage lines or wetlands and the impact on these would therefore be negligible (Map 1 & 2). However, runoff from the surroundings should still be kept separate from the proposed quarry and will need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

The site contains several exotic weeds, of which a few are considered problematic (Appendix B). Operational activities will also increase disturbance and therefore increase the susceptibility for the establishment of weeds and their spread into the surroundings. Monitoring of weed establishment and eradication should form a prominent part of management of the development. Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No. 43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.

The most significant impact on mammals anticipated on the site itself is primarily concerned with the loss and fragmentation of available habitat due to the development of the quarry. Transformation of the natural vegetation on the site will result in a decrease in the population size as available habitat decreases. However, the survey has indicated that the available habitat has already been transformed to a large extent and this function would therefore already be compromised. The anticipated impact can therefore not be regarded as significant. Furthermore, large natural areas occur to the west and south of the site and any mammals on the site are likely to vacate the site into these adjacent areas should development take place. In order to ensure no direct impact on the mammals on the site the hunting, capturing or trapping of mammals on the site should be strictly prohibited during operation of the quarry.

The impact significance has been determined and it is clear that the proposed development is not anticipated to have significant impacts in terms of the ecology. Prior to mitigation most impacts will be low-moderate although there is a moderate impact anticipated for the loss of protected species as well as the likely spread of exotic weeds. However, with adequate mitigation these can easily be reduced to low impacts.

Please refer to Appendix D for the impact methodology.

Significance of the impact:

Impact	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Before Mitigation								
Loss of vegetation type and clearing of vegetation	2	4	2	2.6	4	3	3.5	9.1
Loss of protected species	3	5	1	3	5	3	4	12
Impact on watercourses	1	5	1	2.3	3	3	3	6.9
Infestation with weeds and invaders	3	4	2	3	4	3	3.5	10.5
Impact on Terrestrial fauna	1	4	1	2	3	3	3	6
After Mitigation								
Loss of vegetation type and clearing of vegetation	2	4	2	2.6	4	3	3.5	9.1
Loss of protected species	1	5	1	2.3	2	2	2	4.6
Impact on watercourses	1	4	1	2	2	1	1.5	3
Infestation with weeds and invaders	2	2	1	1.6	3	2	2.5	4
Impact on Terrestrial fauna	1	4	1	2	3	3	3	6

6. SITE SPECIFIC RESULTS

Habitat diversity and species richness:

The proposed site is quite small with a uniform topography and as a result, under natural conditions, it would also not have a significant habitat diversity. In addition, the topography has been modified by the existing borrow pit excavation and species diversity significantly decreased due to previous ploughing. As a result, habitat and species diversity is relatively low.

Presence of rare and endangered species:

Due to the largely modified and transformed nature of the vegetation on the site no rare or threatened species were observed and it is considered unlikely that such a species would occur. However, a few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

Ecological function:

The ecological function of the site has been modified to a large degree. The site functions as habitat for fauna, sustains a specific vegetation type, i.e. Bloemfontein Dry Grassland and also forms part of the catchment of surrounding watercourses, i.e. the Kaalspruit (Map 1 & 2). The natural vegetation on the site has clearly been significantly modified due to previous ploughing and the previous borrow pit. This in turn degrades the habitat available to fauna. Due to the alteration to the topography caused by the existing borrow pit excavation this also influences the natural drainage pattern and will influence its functioning as part of the catchment. Furthermore, the function of the site is not paramount to the continued functioning of the surrounding natural areas. In other words, development of the site should not impair the functioning of the surrounding area to a large extent.

Degree of rarity/conservation value:

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004) (Map 2). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3). The overall conservation value of the site is therefore relatively low.

Percentage ground cover:

The percentage ground cover is moderate to low. The grass layer density would under natural conditions be considerably higher. This is due to previous ploughing but also the previous borrow pit which is mostly devoid of vegetation. The modification of the percentage ground cover is therefore regarded as at least moderate overall.

Vegetation structure:

Naturally the vegetation structure should consist of a dense grass cover with a prominent herbaceous component. These are both still present though their percentage cover has been modified and the species composition as well. The dwarf karroid shrub component is also increased to some extent. Overall the vegetation structure is therefore considered to be moderately modified.

Infestation with exotic weeds and invader plants:

Exotic weeds are quite abundant on the site but do not yet dominate the vegetation (Appendix B).

Degree of grazing/browsing impact:

The area is utilised as grazing for domestic livestock although this is only regarded as having a moderate impact.

Signs of erosion:

Although signs of erosion are not prominent, the decrease in vegetation cover, disturbance of the soil surface and grazing by domestic stock will cause at least a moderate level of sheet erosion.

Terrestrial animals:

Tracks and signs of mammals are common on the site but will be somewhat modified from the natural condition due to the transformed nature of the natural grassland on the site. As the grass layer is modified, so the habitat is modified and in turn the mammal population is modified. However, large areas of natural grassland occur to the west and south of the site and the mammal population will still be largely natural here. Mammal species which are rare and endangered are often habitat specific and sensitive to habitat change. It is therefore considered highly unlikely that such species would occur on the site. It is also considered likely that the site will also contain several other mammal species but these were not observed on the site. Overall the mammal population is therefore regarded as at least moderately modified.

Table 2: Biodiversity Sensitivity Rating for the proposed quarry development.

	Low (3)	Medium (2)	High (1)
Vegetation characteristics			
Habitat diversity & Species richness	3		
Presence of rare and endangered species		2	
Ecological function	3		
Uniqueness/conservation value	3		
Vegetation condition			
Percentage ground cover		2	
Vegetation structure		2	
Infestation with exotic weeds and invader plants or encroachers		2	
Degree of grazing/browsing impact		2	
Signs of erosion		2	
Terrestrial animal characteristics			
Presence of rare and endangered species		2	
Sub total	9	14	0
Total		23	

7. BIODIVERSITY SENSITIVITY RATING (BSR) INTERPRETATION

Table 3: Interpretation of Biodiversity Sensitivity Rating.

Site	Score	Site Preference Rating	Value
De Hoop quarry	23	Acceptable	3

8. DISCUSSION AND CONCLUSION

The proposed site has been rated as being acceptable for the quarry development mostly as a result of the already degraded condition of the vegetation, previous ploughing of the area, the small extent of the site and previous borrow pit on the site.

The proposed quarry is located on the Remainder of the Farm De Hoop 320 which is situated to the south west of the city of Bloemfontein (approximately 19 km). The proposed site already contains a historical borrow pit although the surroundings consist of natural grassland into which the quarry will be expanded. Although natural grassland is still present it is clear that the area has been subjected to significant transformation by previous land uses. The extent of the site is approximately 5 hectares (Map 1). No watercourses or wetlands could be identified on or near the proposed site.

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004) (Map 2). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. The Free State Province Biodiversity Management Plan (2015) has recently been published and has identified areas which are essential to meeting conservation targets for specific vegetation types, i.e. Critical Biodiversity Areas (CBA). The site in question is however listed as being an Other and Degraded area (Map 3). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey. The overall conservation value of the site is therefore relatively low.

The majority of the site has been significantly modified from the natural condition although remnants of the natural grassland is still prominent. A large portion of the site consists of a previous, historical borrow pit which leads to complete transformation of this portion both in terms of topography and vegetation. This consists of a large excavation on the site with a few small overburden and topsoil dumps and general disturbance around it. The borrow pit is largely free draining and has not formed any artificial wetland conditions. It has however completely and irreversibly transformed the vegetation in and around it. The remainder of the proposed site consists of grassland but which has clearly been ploughed previously (Figure 1). The current grass layer is therefore of secondary establishment which is also reflected in the species composition which does not reflect the natural vegetation type and is dominated by pioneer species. Due to the long time since this ploughing occurred a few climax grasses has once again become established but not to a sufficient degree to be considered representative of the natural vegetation type. Small portions of natural grassland occur along the western and southern borders of the site but is also significantly degraded due to the proximity of the previous borrow pit.

The topography of the site is dominated by a plain with a gradual slope from west to east. A low rise is situated to the west of the site and slopes toward the east with a gentle slope. The topography on the site has however been altered significantly by the excavation caused by the previous borrow pit. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site (approximately 1.5 km) (Map 2). The existing borrow pit is inward draining but remains free-draining and has therefore not

formed any artificial wetland conditions. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

No elements of high conservation value or sensitivity occur on the site footprint itself although the few specimens of protected *Brunsvigia radulosa* still has some conservation value (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

The site contains several exotic weeds, of which a few are considered problematic (Appendix B). Operational activities will also increase disturbance and therefore increase the susceptibility for the establishment of weeds and their spread into the surroundings. Monitoring of weed establishment and eradication should form a prominent part of management of the development. Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No. 43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.

The impact significance has been determined and it is clear that the proposed development is not anticipated to have significant impacts in terms of the ecology. Prior to mitigation most impacts will be low-moderate although there is a moderate impact anticipated for the loss of protected species as well as the likely spread of exotic weeds. However, with adequate mitigation these can easily be reduced to low impacts.

In conclusion, the natural grassland on the site has mostly been transformed by the existing borrow pit excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem (Map 2). But since the portion around the site was previously ploughed it is no longer representative of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3). The site and immediate surroundings do not contain any watercourses or wetlands which will be affected by the development (Map 1 & 2). However, clean runoff will still have to be diverted around the site by means of a low berm. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site (Appendix C). Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

9. RECOMMENDATIONS

- Scattered specimens of the protected geophyte, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site. (Appendix C):
 - Permits should be obtained and affected specimens transplanted to adjacent areas where they will remain unaffected.
 - The species is deciduous and will only be visible after sufficient summer rains. It is a geophyte with a subterranean tuber which should be taken into consideration when transplanting specimens.
- Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.
- The hunting, capturing or trapping of fauna, including mammals, reptiles, birds and amphibians, on the site should be strictly prohibited during operation of the quarry.
- Adequate monitoring of weed establishment and their continued eradication must be maintained (Appendix B). Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No. 43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.
- Monitoring of mining operations including weed establishment and erosion should take place.
- Rehabilitation of the mining area should be adequate and should include the following:
 - Overburden and tailings resulting from the mining operations should be returned to excavations in order to aid in re-establishing a more natural topography.
 - The topography of the site should be re-instated as far as possible.
 - Eradication and monitoring of weed establishment should take place and should be extended after cessation of mining (Appendix B).
 - Topsoil should be removed prior to mining where still present, protected from wind erosion and weed establishment and replaced on the site during rehabilitation.
 - Adequate monitoring of rehabilitation success should be done and remedial action taken where required.
 - After mining has ceased all manmade materials should be removed from the site, i.e. structures, concrete, waste, etc.

10. REFERENCES

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Annexure A: Maps and Site photos



General ecology map of a proposed quarry on the Remainder of the Farm De Hoop 320, Bloemfontein, Free State Province.








Map 1: Layout map of the proposed quarry on the Farm De Hoop 320 near Bloemfontein. The existing historical borrow pit is visible on the site. Note also faint plough furrows still visible on the site and surroundings.



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Legend:

-  Site location
-  Road network
-  Watercourses
-  Wetlands and impoundments
-  Property boundaries

Map Information

Spheroid: WGS 84

Quantum GIS

Scale: 1:5 000

DPR Ecologists

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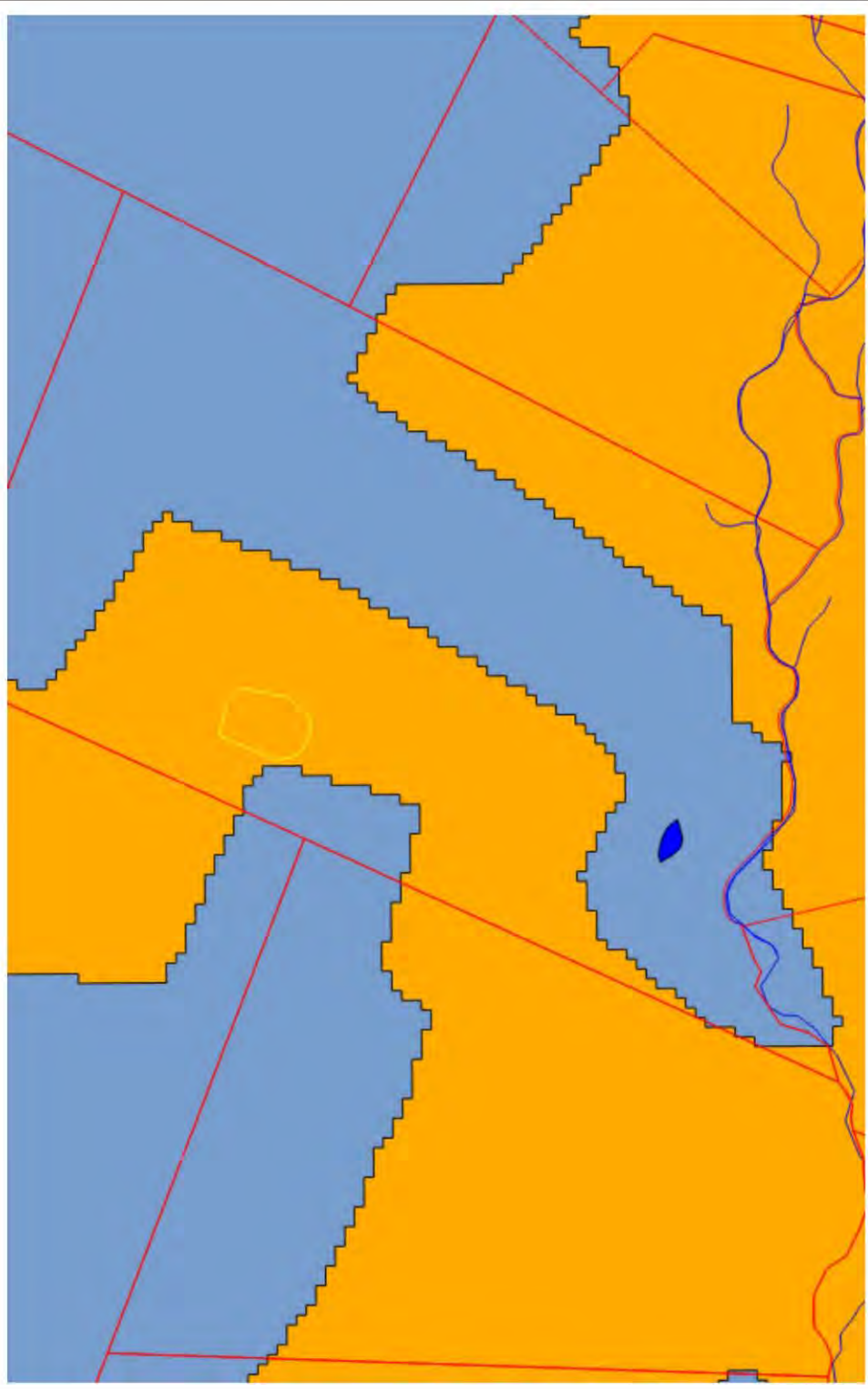
P.O. Box 12726, Brandhof, 9324

Tel: 083 410 0770





General ecology map of a proposed quarry on the Remainder of the Farm De Hoop 320, Bloemfontein, Free State Province.










Map 2: General ecology map of the proposed quarry on the Farm De Hoop 320 near Bloemfontein. Note that the area consists of Bloemfontein Dry Grassland, a listed Threatened Ecosystem. Although this is also indicated for the site, the on-site survey as well as the Free State Biodiversity Management Plan confirms that the natural grassland has been largely transformed on the site. Note also the Kaalspruit, situated to the south of the site.



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Legend:

-  Site location
-  Road network
-  Watercourses
-  Wetlands and impoundments
-  Property boundaries
-  Bloemfontein Dry Grassland
-  Threatened Ecosystems

Map Information

Spheroid: WGS 84

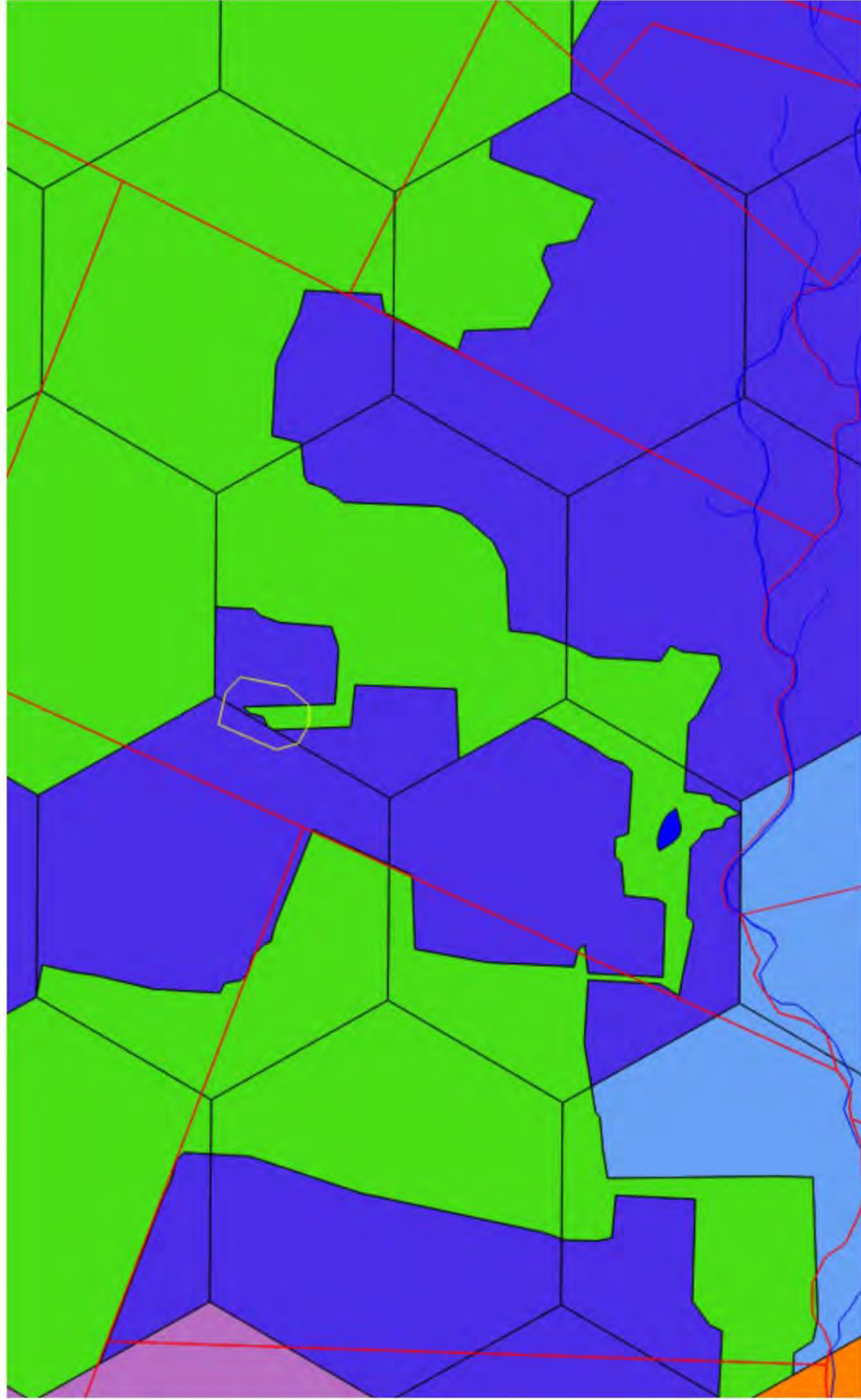
Quantum GIS

Scale: 1:20 000

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Free State Biodiversity Plan map of a proposed quarry on the Remainder of the Farm De Hoop 320, Bloemfontein, Free State Province.



Prepared for:
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Legend:

- Site location
- Road network
- Watercourses
- Wetlands and impoundments
- Property boundaries
- Critical Biodiversity Area 1
- Critical Biodiversity Area 2
- Ecological Support Area 1
- Ecological Support Area 2
- Degraded
- Other

Map Information

Spheroid: WGS 84

Quantum GIS

Scale: 1:20 000

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Map 3: Biodiversity plan map of the proposed quarry on the Farm De Hoop 320 near Bloemfontein. The site is situated within a Degraded and Other categories and confirms the largely transformed condition of the vegetation on the site.



Figure 1: Panorama of the site showing the existing borrow pit excavation. Note transformation of the topography and vegetation with a very low percentage vegetation cover re-establishing.



Figure 2: Panorama of the site showing the existing borrow pit excavation. Note that it remains free draining.



Figure 3: Panorama of the site around the existing borrow pit. A moderately dense grass layer is present. The species composition is clearly dominated by pioneer grasses.



Figure 4: Panorama of the site showing the surrounding grassland. Again, note the dominance of pioneer grasses. The gentle slope of the site is also clearly visible (red arrow).



Figure 5: Another panorama of the site illustrating the pioneer grass layer dominating the area.



Figure 6: View of the soil profile at the site indicates a shallow topsoil layer, dominated by sandy-loam soils overlying weathered dolerite.



Figure 7: Tracks and signs of mammals on the site include clockwise from top left: tracks of Springhare (*Pedetes capensis*), tracks of a small antelope, either that of the Common Duiker (*Sylvicapra grimmia*) or Steenbok (*Raphicerus campestris*), burrow of an Aardvark (*Orycteropus afer*) and soil mounds of the Common mole rat (*Cryptomys hottentotus*).

Appendix B: Species list

Species indicated with an * are exotic.

Protected species are coloured orange and Red Listed species red.

Species	Growth form
* <i>Amaranthus viridis</i>	Herb
* <i>Argemone ocrholeuca</i>	Herb
* <i>Chenopodium schraderianum</i>	Herb
* <i>Opuntia engelmannii</i>	Succulent
* <i>Solanum eleagnifolium</i>	Herb
<i>Acrotome inflata</i>	Herb
<i>Amphiglossa triflora</i>	Dwarf shrub
<i>Aristida congesta</i>	Grass
<i>Aristida diffusa</i>	Grass
<i>Asparagus larcinus</i>	Shrub
<i>Barleria macrostegia</i>	Herb
<i>Brunsvigia radulosa</i>	Geophyte
<i>Chenopodium album</i>	Herb
<i>Chrysocoma ciliata</i>	Dwarf shrub
<i>Cyperus rupestris</i>	Sedge
<i>Dicoma macrocephala</i>	Herb
<i>Digitaria eriantha</i>	Grass
<i>Elionurus muticus</i>	Grass
<i>Enneapogon cenchroides</i>	Grass
<i>Eragrostis lehmanniana</i>	Grass
<i>Eragrostis nindensis</i>	Grass
<i>Eragrostis superba</i>	Grass
<i>Eriocephalus ericoides</i>	Dwarf shrub
<i>Helichrysum dregeanum</i>	Dwarf shrub
<i>Hertia pallens</i>	Dwarf shrub
<i>Heteropogon contortus</i>	Grass
<i>Kyllinga alba</i>	Sedge
<i>Limeum viscosum</i>	Herb
<i>Lycium horridum</i>	Dwarf shrub
<i>Melolobium candicans</i>	Dwarf shrub
<i>Merremia verecunda</i>	Climber
<i>Nidorella resedifolia</i>	Herb
<i>Oxalis depressa</i>	Geophyte
<i>Panicum coloratum</i>	Grass
<i>Pogonarthria squarrosa</i>	Grass
<i>Pollichia campestris</i>	Herb
<i>Ruschia unidens</i>	Succulent
<i>Selago albida</i>	Herb
<i>Sesamum triphyllum</i>	Herb
<i>Setaria pallide-fusca</i>	Grass

<i>Themeda triandra</i>	Grass
<i>Tragus keelerioides</i>	Grass
<i>Trichoneura grandiglumis</i>	Grass
<i>Urochloa panicoides</i>	Grass
<i>Wahlenbergia nodosa</i>	Dwarf shrub

Appendix C: Protected species on the site

Protected species on the site may not be limited to these species but these species have identified on and around the site. Additional sources should be consulted to confirm the presence of protected species.



Brunsvigia radulosa
Kandelaar Lelie/Candelabra Lily

Protected species

National Red List Status: Least Concern (LC)

Remove this species where present and transplant to a suitable area where no disturbance will take place.

Leaves are deciduous and plants will not be easily identifiable during winter months.

Appendix D: Impact methodology

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

$$\text{Environmental Significance} = \text{Overall Consequence} \times \text{Overall Likelihood}$$

Determination of Consequence

Consequence analysis is a mixture of quantitative and qualitative information and the outcome can be positive or negative. Several factors can be used to determine consequence. For the purpose of determining the environmental significance in terms of consequence, the following factors were chosen: Severity/Intensity, Duration and Extent/Spatial Scale. Each factor is assigned a rating of 1 to 5, as described below and in tables 6, 7, 9 and 10.

Determination of Severity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment.

Table 7 will be used to obtain an overall rating for severity, taking into consideration the various criteria.

Table 7: Rating of severity

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

Determination of Duration

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

Table 8: Rating of Duration

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

Determination of Extent/Spatial Scale

Extent refer to the spatial influence of an impact be local (extending only as far as the activity, or will be limited to the site and its immediate surroundings), regional (will have an impact on the region), national (will have an impact on a national scale) or international (impact across international borders).

Table 9: Rating of Extent / Spatial Scale

Rating	Description
1: Low	Immediate, fully contained area
2: Low-Medium	Surrounding area
3: Medium	Within Business Unit area of responsibility
4: Medium-High	Within Mining Boundary area
5: High	Regional, National, International

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarised below, and then dividing the sum by 4.

Table 10: Example of calculating Overall Consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	10
TOTAL CONSEQUENCE:(Subtotal divided by 4)	3.3

Likelihood

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described below and in Table 11 and Table 12.

Determination of Frequency

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

Table 11: Rating of frequency

Rating	Description
1: Low	Once a year or once/more during operation/LOM
2: Low-Medium	Once/more in 6 Months
3: Medium	Once/more a Month
4: Medium-High	Once/more a Week
5: High	Daily

Determination of Probability

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

Table 12: Rating of probability

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

Overall Likelihood

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

Table 13: Example of calculating the overall likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	6
TOTAL LIKELIHOOD (Subtotal divided by 2)	3

Determination of Overall Environmental Significance

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

Table 14: Determination of overall environmental significance

Significance or Risk	Low	Low-Moderate	Moderate	Moderate-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 - 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect or impact.

Table 15: Description of the environmental significance and the related action required.

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

APPENDIX D



Public Participation Process

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Enquiries: Mr. Richard Williamson

12th March 2020

Minutes of the public participation meeting held for the Environmental Impact Assessment for the proposed mining permit for the establishment of a quarry on the remainder of farm De Hoop 320.

Date: 04 March 2020

Time: 09:00am

Venue: Eko Environmental Offices, 94 Victoria street, Park West, Bloemfontein.

Attendees: Mr. P. Crouse
Mr. D Wambach
Mr. LA. Schlebusch
Mr. T. Wolmarans
Mr. M König
Mrs. E Human
Mr. D Human
Mr. A Pool
Mr W. Van der Merwe (WLS trust)
Mr. R. Williamson (Eko Environmental)

Purpose of the meeting

The purpose of this meeting was to discuss the status of the project, describe the BAR process and notify all **relevant authorities and I&AP's of what to expect in the coming phases**. Secondly the purpose was to discuss and obtain more information on the issues that had already been raised by neighbouring parties.

Opening

Mr. Williamson opened by welcoming and thanking everyone for attending the meeting. He also requested that all **attendees sign the attendance register and to make sure their details are correct to ensure that all I&AP's receive the documents in future.**

Mr. Williamson briefly explained the process that will be followed and the status of the project. He indicated that the project is only in the application phase of the Basic Assessment Report (BAR) process and that the physical development has not commenced. Mr. Williamson continued by describing the BAR process and stated that the next phase of the project will be the submission of the draft BAR to the Department of Mineral Resources (DMR) and that all concerned parties present will also receive a copy to review and comment on. Mr. Williamson added that the specialist studies such as the Ecological and Wetland assessment and the Heritage Impact Assessment will be available in the Draft BAR report. Mr. Williamson concluded the welcoming by reviewing the issues that had been raised before this meeting and invited the attendees to ask questions.

Discussion

The first issue to be discussed was the issue of dust suppression. Mr. Schlebusch commented on the issue of dust and dust suppression responsibilities of the applicant. Mr. Schlebusch stated that the idea of using water to limit dust along the access road and at the site was a good idea. Mr. Schlebusch further stated that red dust was an issue and that the access road would have to be well maintained in order for dust suppression to be efficient.

The second issue to be raised was the access road to the site itself. Mr. Wolmarans indicated that the owner of the portion 2 of farm Kwestiefontein (MAK Trust), whom he represents, is concerned about the proposed access road as it passes directly through his farm. Mr. Williamson indicated that the access road proposed in the application is the road that goes through portion 2 of Farm Kwestiefontein and is the current access road to the site location, both the farm which is remainder of farm De Hoop 320, and the existing quarry. Mr. Williamson further stated that all farms must have some type of access for the landowner to reach the said farm and that some type of access road should be available. Mr. Williamson further stated that if any suggestions or recommendations can be made regarding an alternative access road then those present must please do so.

Mr. Wolmarans asked what the status of the access road is to which Mr. Williamson replied that he is unsure and still trying to ascertain the answer. Mr. Wolmarans stated that the proposed access road is not a servitude road and wanted to know what type of road it is and if it was a proclaimed road. Mr. Williamson indicated that he is still trying to determine the status of the access road and indicated that it is often mentioned in the title deeds of the respective farms. Mr. Wolmarans indicated that he had the title deed of portion 2 of farm Kwestiefontein with him and that it makes no mention regarding the status of the road or mention of any servitudes or proclaimed roads for the property. Mr. Wolmarans then asked Mr. van der Merwe if he knew the status of the road. Mr. van der Merwe stated that he had spoken to the contractors who had worked on the R706 recently and was waiting for feedback from them. Mr. Williamson stated that the applicant is open to proposed alternative routes but that the proposed access road is the preferred route as it is currently how access is obtained to the farm on which the site is located and that the access road is connected to the existing quarry where the proposed site will be.

Mr. Wolmarans then raised the next issue which is the issue regarding water use for dust suppression and the need for a water use license (WUL). Mr. Wolmarans asked if there is a WUL for the farm and if there is, may that water be used for activities relating to the quarry. Mr. Williamson indicated that there is a WUL for the farm and that the Department of Water and Sanitation (DWS) is registered as an I&AP and that all information has been sent to them in the application process. Mr. van der Merwe confirmed that there is a WUL for the farm and that it has already been transferred to the applicant's name (WLS Trust). Mr. van der Merwe further stated that he confirmed that when it comes to water rights on a farm it can be used for any purpose in so long as it does not trigger any other water use requirements and that you **don't** go over the allocated threshold. Mr. Wolmarans then asked how much water the water right is for. Mr. van der Merwe stated that the allocated amount is 591 000 cubic meters per annum for 69 hectares.

Mr. Wolmarans then asked how much capacity is expected to be used for dust suppression. Mr. van der Merwe said it he would need approximately 15 000 litres in 2 hours to spray the road for dust suppression. Mr. van der Merwe further stated that he does not foresee the dust being a big problem as he has installed trackers in all his trucks and that speed limits will be imposed for drivers of between 40 km/h – 50 km/h along the entire access route to the R706. Mr. van der Merwe further stated that he has water trucks that can also be used to aid in dust suppression by riding up and down the access road so he **doesn't** see the dust being an issue along the access road. Mr. van der Merwe indicated that the access road through portion 2 of Farm Kwestiefontein will be his responsibility to maintain and that he has already started to maintain and repair the road upon his purchasing of the remainder of

farm De Hoop 320. Mr van der Merwe stated that he has already laid gravel at parts of the access road and that at parts where red dust is still present he indicated that he will also lay gravel and level it with 12 ton roller trucks to further improve the road and reduce the impact of dust. Mr van der Merwe again stated that he commits to maintain and manage the road and that this is the first time in 8 years that road has seen any form of maintenance. Mr Wolmarans asked Mr van der Merwe if the road will require widening to accommodate the trucks. Mr van der Merwe stated that the access road is already wide enough for two trucks to ride past one another. Mr van der Merwe further stated if the access road needs to be widened then he would be able to widen the road as there is sufficient space next to the road for widening.

Mr Wolmarans then asked Mr König which access road would be more suitable for him. Mr König indicated that he would prefer the alternative access road through excelsior as opposed to the current proposed access road as the road passes close to the stores and house where he intends to conduct agricultural activities. Mr van der Merwe commented that he is unaware of an access road that is able to pass through on that side of the farm and that he intends to use the proposed access road as it is the road that provides access to the farm and also to the quarry.

Mr van der Merwe then asked that the surrounding landowners give him a chance with the proposed access road and the project in general and that he will maintain the proposed access road. Mr van der Merwe further mentioned the state of the farms, De Hoop 320 and Kwestiefontein, indicating that they had been inactive for some time and were in bad condition. Mr van der Merwe also mentioned that presence of vagrants that were sleeping on the farms that he had removed. Mr van der Merwe went on to say that due to him being more active on the Farm De Hoop 320, coupled with the fact that he also farms there, will security and safety increase as opposed to being a bigger issue. Mr van der Merwe stated that cameras will be installed on site at the quarry and the entrance to the farm and that all his workers he intends to use for the proposed project will be current or former employees of his other businesses that have worked for him for more than 6 years. Mr van Der Merwe also stated that none of the employees will live or remain on site and that they will only be on site during normal operational hours.

Mr Wolmarans then asked how the dolerite gravel will be excavated and if blasting with dynamite will occur. Mr van der Merwe replied by saying that no blasting will occur in the project and that he thinks there is a misconception regarding what will take place at the proposed quarry. Mr van der Merwe clarified that no blasting would occur to safety reasons and also because he also uses the farm for farming purposes and does not want to frighten surrounding livestock. Mr van der Merwe indicated that the dolerite gravel will be excavated with a modern 2019 excavator that has noise cancelling technology to reduce noise. Mr van der Merwe further stated that there will not be a thoroughfare of people such as seen at diamond mines and that access will be strictly controlled.

Mr Wolmarans again stated that the main concerns surrounding this project have to do with the dust generated and the effect it will have on livestock belonging to the surrounding farmers. Mr Wolmarans stated that if the project were to get approval and livestock start to get sick and die following the start of the project how will Mr van der Merwe handle such an issue. Mr van der Merwe indicated that he would speak to his broker to see if he could get some type of insurance or guarantee against such a risk. Mr van der Merwe again stated that he would be responsible for maintaining the access road and that good maintenance coupled with dust suppression with water will ensure that dust generated will be none to minimal. Mr van der Merwe further stated that he will gravel the access road and that this is the first time in 8 years that the proposed access road is being maintained and this is at his cost. Mr Wolmarans asked Mr van der Merwe how often would the access road have to be sprayed for dust suppression. Mr van der Merwe indicated that when dust becomes a problem then water could be sprayed every hour and that he has the water trucks and pumps to do this. Mr van der Merwe also said that the closest farm with sheep to the proposed quarry that farms sheep is more than 1.5km from the quarry and that dust cannot travel so far. Mr van der Merwe said that only his sheep would be close enough to be affected and that he will take measures to ensure that they are not impacted by the quarry operations. Mr König asked Mr van der Merwe what workers have worked for him for more than 6 years because as far as he knows the current workers at the farm have only been there since last year. Mr van der Merwe stated that the workers he intends to use at the quarry will not be from the farm and that they are from his other construction business. Mr König stated that he has been farming and looking after the Farm Kwestiefontein since last year and he has not heard anything concerning vagrants that sleep on the farms. Mr König further stated that he is concerned about the safety of those living in the area in regards to the workers that will be coming in and out of the quarry. Mr van der Merwe replied to Mr König stating that he could go show Mr König where the vagrants used to sleep and that the cables at the swimming pool had likely been stolen and burnt by the same people.

Mr Dieter Wambach stated that Mr van der Merwe had stated that no sheep farmers are close to the operation but indicated that his and Braams farms are next to the proposed quarry operation. Mr van der Merwe indicated that Mr Wambach is situated to the north of the quarry and that there is a ridge that separates the quarry from his land. Mr van der Merwe further stated that the wind doesn't not blow in the northerly direction. Mr König was worried about the dust affecting livestock. Mr König raised his concerns about the dust from the quarry operation affecting his sheep, especially the lambs and calves that he intends to raise in the stores close to the access road.

Mr Crouse raised an issue with the alternative access road which is called excelsior. Mr Crouse indicated the road passes close to the house, sheep kraal and vegetable gardens and that they will never agree to such an access road for the proposed project. Mr Crouse also indicated that they have a borehole at their farm which they use for their farming activities and that they are concerned that the quarry operations will occur beneath the water table and lead to dewatering of the water table in the area, thus leading to the water table being lowered in the entire area. Mr van der Merwe indicated that the quarry will not be over an area exceeding more than 5 hectares and that the depth is not expected to be deep as extracting and accessing the material becomes too costly. Mr van der Merwe further stated that DMR as the competent authority will not allow a project to go ahead they **don't** deem feasible.

Mrs Engela Human stated that one of her concerns was the people that would be staying on the farm but clarified that Mr van der Merwe had already explained that the workers at the quarry would not be staying on the farm. is worried about the use of water for dust suppression and how that will affect the water table. Mrs Human then raised a concern that since Mr van der Merwe had started using water at remainder of Farm De Hoop 320 the water table at the boreholes on their farm had dropped a few meters. Mrs Human carried on to say that they are worried that the additional use of water will put more strain on the water table. Mrs Human indicated that 50% of their farming operations are vegetables and fruit and that these are water dependent. Mr Schlebusch indicated that it is a requirement for farmers to install water meters and monitor their water use which must be sent to DWS on a monthly basis in an excel spreadsheet. Mr Schlebusch stated that many concerns regarding the issue of water and water security can be addressed if Mr van der Merwe was to install water meters at the boreholes and diligently monitor the amounts of water used. Mr van der Merwe stated that he agrees with Mr Schlebusch and indicated that he commits to install water meters at his boreholes and to monitor the amount of water that he uses.

Mr van der Merwe further stated that he has several other farms in the area and that all of them are struggling with water due to the recent drought. Mr van der Merwe went on to say that many areas were sprayed and cultivated that **shouldn't** have been and that many surrounding farmers have overutilized there boreholes and this has negatively affected the water table in the area. He further stated that he **doesn't** use close to the allocated amount for the farm and that the amount the quarry will require will be negligible in comparison. Mr Wolmarans asked if it would be possible for Mr van der Merwe to indicate how much water he is expected to use for the operation on a monthly and yearly basis in order to monitor the quality of water the operation would use.

Issue of the road and maintenance thereof. Mr Pool indicated that road leading towards the quarry from Bloemfontein, namely the R706, is already in bad condition and that he has personally repaired it on several occasions at his own cost. Mr Pool wanted to know what would happen to the maintenance of that road regarding all the trucks that will be using the road to access the quarry. Mr Schlebusch further inquired if an impact study on the road would be possible to determine the impact the proposed operation would have on the road. Mr Williamson indicated that traffic impact studies are conducted for similar projects but was not deemed necessary due to the size of the project and that the impact on traffic would be negligible. Mr Williamson further stated that the impact on the condition of the R706 would be futile as the municipality or SANRAL who is responsible for handling the road is aware of the problem but lack the funding and capacity. Mr Pool again stressed the terrible condition of the R706 in that area and that what could be done to maintain the road. Mr van der Merwe agreed with Mr Pool that the road is an issue and that something would have to be done. Mr van der Merwe further stated he pays license fees for his trucks and that they are loaded to required specification and it is within his right to use the road and not his responsibility to maintain it.

Mr Wolmarans again raised the concern that dust would have on the health of livestock currently being utilised in the area an whether some type of insurance and guarantee is possible. Mr van der Merwe replied by stating that he would find out about some insurance for livestock but that it would be specifically against dust and not other sicknesses.

Mr Williamson stated that should the project get the go-ahead, there would still be a complaints register that forms part of the EMPr where any concerns could be raised for the said project. Mr Williamson then further stated that should issues be raised these concerns can then be sent to DMR who will then assess the merits of the concerns raised and then inform the permit holder to address the concerns should they be deemed serious.

Mr König wanted to know the times the trucks would be accessing the premises. Mr Williamson indicated that the trucks would only operate at normal working hours between 8am to 5pm. Mr Schlebusch wanted to know what would happen should some of the issues raised at this meeting occur and how would it be addressed. Especially if several complaints had already been raised. Mr Williamson indicated that because the project has several concern he would ensure that complaints are heard and that they are welcome to contact him or Mr van der Merwe personally should concerns occur as a result of the operation of the quarry. Mr Wolmarans asked if the mining permit licence could be revoked if concerns are not addressed. Mr Williamson stated that he does not think this is the case but that the DMR could ask the license holder to address these concerns or face penalties.

Mr Schlebusch asked how Mr van der Merwe would win their trust regarding the proposed project and ensure that concerns would be addressed should such concerns occur as a result of the operation. Mr Williamson stated that the application is not so simple and that part of the application for the mining permit includes the technical guarantee, mining operation plans and business plan which WLS trust is then obligated to commit to if the license is awarded.

Mr Wolmarans again stressed the primary concerns of the surrounding landowners is the use of water, the health issues of the livestock and the access, upkeep and maintenance of the road as well as security. Mr Williamson agreed that these are the primary issues which will be given focus in the report and that Mr van der Merwe had already committed to addressing these concerns. Mr Wolmarans then wanted to know that the next step is. Mr Williamson responded that the next step is submitting the environmental impact reports to DMR and other stakeholders for comment which goes out for 30 days to comment on. After the 30 days are complete the final comments on the reports are then included in the Final report that is then submitted to DMR for processing and a decision is then reached by DMR based on the merits of the application.

Mr Schlebusch wanted to know if there is some kind of guarantee or retainer for the operation. Mr Williamson confirmed that there is and that is given to DMR as a guarantee to ensure that rehabilitation of the site does occur upon the completion of the quarry.

Closing

Mr. Williamson concluded by saying thank you to all those who attended the meeting and for their input and asked again if everyone had signed the attendance register. Mr. Williamson also stated that the minutes of this meeting will be sent to all who attended the meeting and that all documents relating to the Draft BAR and EMPr will be sent to all I&APs for review. The meeting was adjourned as all aspects were discussed and clarified.

APPENDIX: E



Impact Assessment

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Reg no. 2017/311178/07

VAT No. 4020225811

IMPACT ASSESSMENT:

IN SUPPORT OF A MINING PERMIT AND
ENVIRONMENTAL AUTHORISATION APPLICATION FOR
THE ESTABLISHMENT OF A QUARRY ON REMAINDER OF
FARM DE HOOP 320, BLOEMFONTEIN, FREE STATE

DMR Ref. No.: FS 30/5/1/3/2/10301 MP

July 2020

Applicant:

WLS Trust

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1. Assessment methodology

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

Environmental Significance = Overall Consequence x Overall Likelihood.

1.1 Determination of Consequence

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

Determination of Severity

Severity relates to the nature of the event, aspect or impact to the environment and describes how severe the aspects impact on the biophysical and socio-economic environment (Table 1).

Table 1: Rating of severity

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

Determination of Duration

Duration refers to the amount of time that the environment will be affected by the event, risk or impact, if no intervention e.g. remedial action takes place (Table 2).

Table 2: Rating of Duration

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

Determination of Extent/Spatial Scale

Extent refer to the spatial influence of an impact be local (extending only as far as the activity, or will be limited to the site and its immediate surroundings), regional (will have an impact on the region), national (will have an impact on a national scale) or international (impact across international borders) (Table 3).

Table 3: Rating of Extent / Spatial Scale

Rating	Description
1: Low	Immediate, fully contained area
2: Low-Medium	Surrounding area
3: Medium	Within Business Unit area of responsibility
4: Medium-High	Within Mining Boundary area
5: High	Regional, National, International

Determination of Overall Consequence

Overall consequence is determined by adding the factors determined above and summarised below, and then dividing the sum by 4 (Table 4).

Table 4: Example of calculating Overall Consequence

Consequence	Rating
Severity	Example 4
Duration	Example 2
Extent	Example 4
SUBTOTAL	Example 10
TOTAL CONSEQUENCE:(Subtotal divided by 4)	Example 3.3

Likelihood

The determination of likelihood is a combination of Frequency and Probability. Each factor is assigned a rating of 1 to 5, as described and in Tables 5 and 6.

Determination of Frequency

Frequency refers to how often the specific activity, related to the event, aspect or impact, is undertaken (Table 5).

Table 5: Rating of frequency

Rating	Description
1: Low	Once a year or once / more during operation / LOM
2: Low-Medium	Once / more in 6 Months
3: Medium	Once / more a Month
4: Medium-High	Once / more a Week
5: High	Daily

Determination of Probability

Probability refers to how often the activity/event or aspect has an impact on the environment (Table 6).

Table 6: Rating of probability

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

Overall Likelihood

Overall likelihood is calculated by adding the factors determined above and summarised below, and then dividing the sum by 2 (Table 7).

Table 7: Example of calculating the overall likelihood

Consequence	Rating
Frequency	Example 4
Probability	Example 2
SUBTOTAL	Example 6
TOTAL LIKELIHOOD (Subtotal divided by 2)	Example 3

Determination of Overall Environmental Significance

The multiplication of overall consequence with overall likelihood will provide the environmental significance, which is a number that will then fall into a range of LOW, LOW-MEDIUM, MEDIUM, MEDIUM, MEDIUM-HIGH or HIGH, as shown in the table below (Table 8).

Table 8: Determination of overall environmental significance

Significance or Risk	Low	Low-Moderate	Moderate	Moderate-High	High
Overall Consequence X Overall Likelihood	1 - 4.9	5 - 9.9	10 - 14.9	15 – 19.9	20 - 25

Qualitative description or magnitude of Environmental Significance

This description is qualitative and is an indication of the nature or magnitude of the Environmental Significance. It also guides the prioritisations and decision making process associated with this event, aspect or impact (Table 9).

Table 9: Description of the environmental significance and the related action required.

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

Proposed Mitigation:

- Topsoil will be removed before operation commences and stockpiled appropriately and in such a manner to prevent any loss thereof. Topsoil will not be used for any construction purposes and will be used at an alternative location where it can be utilised effectively.
- Topsoil will then be used during the rehabilitation and construction of a storm water system for the site.
- Gravel and dolerite to be used during construction will be acquired from a commercial source. In the event that the applicant will mine the material on site a mining permit will have to be obtained before mining.
- Construction equipment will be maintained and drip trays will be used to prevent spillages of petrochemical products which may cause contamination of soil. Any hazardous substances on the site will be stored in a bunded area which consists of an impermeable floor with walls which will have the capacity to contain 110% of the volume of the substance stored therein.

3. Climate

The study area falls within the Managaung Municipality within the central Free State, a warm-temperate, summer rainfall climate, where the average temperature (at 15.7 °C) is considered warm, and exceedingly more so in the summer months. Frost occurrences are not uncommon within the winter months and averages at relatively 37 days per annum.

Precipitation as rainfall amounts to an overall mean annual precipitation (MAP) of approximately 530 mm, well within the regions average at 500-600 mm (Bailey & Middleton, 2005). Given the relation between the MAP and the high average temperature, the mean annual evaporation of the A-pan (MAE) for the catchment is also considered high at 2 200-2 600mm (Mucina & Rutherford, 2006).

Due to the nature, extent and duration of the project, it is not expected that the proposed establishment of the quarry will have any impact on the climate in the area and is therefore not evaluated further.

4. Land use

The site is currently vacant with no existing infrastructure. The site was used historically for housing livestock for grazing on occasion and the vegetation is in a degraded condition due to the presence of an old quarry. The current application for a mining permit includes the footprint of the existing quarry.

Potential impacts on the land use of the site:

- The land use and characteristics of the land will change from being an area that was used for grazing of animals to an area used for a quarry and its associated infrastructure.
-

Alternatives	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Impact on Land use	3	3	3	3	4	4	4	12

MITIGATED	2	2	2	2	3	3	3	6
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There will be a definite impact on the land use of the site as the land is going to be transformed. The significance of the impacts will be Moderate if no mitigation is implemented. With mitigation the significance of the impact can be Low - Moderate.

It is important to note that the natural grassland on the site has mostly been transformed by the existing borrow pit excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem (Map 2). But since the portion around the site was previously ploughed it is no longer representative of this vegetation type.

Proposed mitigation:

- The area should be kept clean of littering and other pollutants during the operation phase to minimise littering on the surrounding environment.
- The proposed operation should only occur in phases to allow completed areas to be rehabilitated concurrently.
- The proposed area should be demarcated and fenced to ensure that the surrounding land use is not affected and preserved.
- Areas within the proposed footprint that are not used for the operation should not be cleared of vegetation unnecessarily.

5. Plant and Animal life

According to Mucina & Rutherford (2006) the area consists of Bloemfontein Dry Grassland (Gh 5). This vegetation type is currently listed as being a Vulnerable (VU) ecosystem under the National List of Threatened Ecosystems (Notice 1477 of 2009) (National Environmental Management Biodiversity Act, 2004), see Map 2 of the ecological specialist report in appendix 3). As a result, where natural portion of Bloemfontein Dry Grassland still occur intact, they have to be regarded as having a significant conservation value. However, the on-site survey and available aerial images clearly indicate previous transformation of the grass layer and it is no longer regarded as a good representative sample of this vegetation type. The site in question is listed as being an Other and Degraded area according to the Free State Province Biodiversity Management Plan (2015), see Map 3 of the ecological specialist report in appendix 3). This confirms the largely transformed nature of the site and was confirmed as such by the on-site survey. The overall conservation value of the site is therefore relatively low.

The site does not form part of a Critical Biodiversity Area (CBA) in terms of the Free State Province Biodiversity Management Plan (2015) but is located in an Ecological Support Area 1 (ESA 1) which still functions in the support of such areas. The proposed development is however not envisaged to alter the ecological support functioning to a large degree. The habitat and species diversity on the site is considered moderate in terms of this region and does not contain any rare or endangered species. However, a bulb species of significant conservation value, *Gladiolus permeabilis*, forms a small colony along the eastern border, see Map 1 in the ecological specialist report seen in appendix C. This colony should be excluded from the development footprint as far as possible and where this is not possible the necessary permits must be obtained to transplant it to an adjacent area where it will remain unaffected. The topography of the site is dominated by a plain with a gradual slope from west to east. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated

to the south of the site (approximately 1.5 km). The existing borrow pit is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

No elements of high conservation value or sensitivity occur on the site footprint itself although the few specimens of protected *Brunsvigia radulosa* still has some conservation value. Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

In conclusion, the natural grassland on the site has mostly been transformed by the existing quarry excavation and ploughing of the surrounding grassland. The natural vegetation type, Bloemfontein Dry Grassland (Gh 5), is currently listed as being a Vulnerable (VU) ecosystem. But since the portion around the site was previously ploughed it is no longer representative of this vegetation type. This is also substantiated by the Free State Province Biodiversity Management Plan (2015) which lists the site as being an Other and Degraded area (Map 3 of the ecological specialist report in appendix 3). The site and immediate surroundings do not contain any watercourses or wetlands which will be affected by the development (Map 1 & 2 of the ecological specialist report in appendix 3). However, clean runoff will still have to be diverted around the site by means of a low berm. A few specimens of the protected bulb, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site. Although not considered rare or threatened they are still protected species and as such the necessary permits must be obtained and affected specimens transplanted to an adjacent area where they will remain intact.

Potential impacts on vegetation and animals:

- Transformation of the land,
- Loss of approximately 4.5ha of partly indigenous vegetation of the Bloemfontein Dry Grassland,
- The growth and spreading of alien plant species,
- Fires made on the site by employees may result in the loss of vegetation of the surrounding environment,
- Destruction of habitat and loss of animal life.

Refer to the Ecological Impact Assessment attached in Appendix C.

Impacts	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Mortality of fauna and flora	3	4	3	3.3	4	3	3.5	11.55
MITIGATED	2	3	2	2.3	3	3	3	6.9
Invasion of alien species	2	3	2	2.3	3	3	3	6.9
MITIGATED	1	1	1	1	2	2	2	2
Habitat	2	3	2	2.3	3	3	3	6.9

fragmentation								
MITIGATED	2	1	2	1.7	3	2	2.5	4.25

There will be a definite impact on vegetation and animal life (if any) as the site will be transformed and indigenous vegetation will be removed during the establishment of the quarry. However, as indicated by Mr. Van Rensburg in the ecological report the vegetation on the site is not endangered in any way. Taking into consideration that the vegetation on the site will be removed the significance of the impacts will be Low-Moderate without mitigation and Low with the implementation of mitigation measures. .

Proposed mitigation:

- Scattered specimens of the protected geophyte, *Brunsvigia radulosa*, occur along the fringe of natural grassland along the southern border of the site.:
 - Permits should be obtained and affected specimens transplanted to adjacent areas where they will remain unaffected.
 - The species is deciduous and will only be visible after sufficient summer rains. It is a geophyte with a subterranean tuber which should be taken into consideration when transplanting specimens.
- Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.
- The hunting, capturing or trapping of fauna, including mammals, reptiles, birds and amphibians, on the site should be strictly prohibited during operation of the quarry.
- Adequate monitoring of weed establishment (invasive alien species) and their continued eradication must be maintained. Where category 1 and 2 weeds occur, they require removal by the property owner according to the Conservation of Agricultural Resources Act, No. 43 of 1983 and National Environmental Management: Biodiversity Act, No. 10 of 2004.
- Monitoring of mining operations including weed establishment and erosion should take place.
- Rehabilitation of the mining area should be adequate and should include the following:
- Overburden and tailings resulting from the mining operations should be returned to excavations in order to aid in re-establishing a more natural topography.
- The topography of the site should be re-instated as far as possible.
- Eradication and monitoring of weed establishment should take place and should be extended after cessation of mining.
- Topsoil should be removed prior to mining where still present, protected from wind erosion and weed establishment and replaced on the site during rehabilitation.
- Adequate monitoring of rehabilitation success should be done and remedial action taken where required.
- After mining has ceased all manmade materials should be removed from the site, i.e. structures, concrete, waste, etc.

6. Surface Water

There are no surface water features located near the proposed development. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of

the site (approximately 1.5 km). The existing quarry is inward draining but remains free-draining and has therefore not formed any artificial wetland conditions. Despite the absence of any watercourses or wetlands, the proposed quarry will still need to divert clean runoff around the site which should be easily attainable by implementing a low berm around the perimeter.

Potential impacts which might occur on surface water:

- Storm water may become contaminated because of spillages and mismanagement of petrochemical substances during operation of the quarry.

Impacts	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Pollution of surface water resources	3	2	2	2.3	3	3	3	6.9
MITIGATED	2	1	2	1.7	2	2	2	3.4
Decrease in surface water quantity	2	3	3	2.7	3	2	2.5	6.8
MITIGATED	2	2	2	2	2	2	2	4

During the operational phase the infrastructure will be completed and will result in storm water being blocked and not being allowed to drain naturally into the surrounding environment. The significance of the impacts on surface water will be Low-Moderate if no mitigation measures are implemented and Low with the implementation of mitigation measures.

It is important to note that no surface water features are located near the proposed development. No watercourses or wetlands occur near the site with the nearest watercourse being the Kaalspruit situated to the south of the site (approximately 1.5 km).

Proposed mitigation:

- An adequate storm water management system will be implemented during start-up and operation to accommodate runoff during rain events as well as to divert the water around the development to the surrounding drainage basins (through the use of berms). Storm water management systems will be maintained, repaired and cleaned regularly to ensure its functionality and to prevent potential impacts from occurring on surrounding surface water resources.
- Once the operation is completed, all open natural slopes must be re-vegetated to prevent soil erosion from occurring which might lead to siltation of surface water resources.
- Any hazardous substances permanently stored on site will be stored in a bunded area with a capacity to contain 110% of the volume of the substance. The bunded area will have a controlled outlet from which rain water collected therein can be drained and managed as hazardous waste.
- Spillages of hazardous substances will be cleaned by removing the spill and contaminated soil and disposing of it as hazardous waste.

- The site will be kept clean and tidy to prevent general waste and littering from occurring in the surrounding surface water resources.
- Any incidents on surface water resources during construction will be reported to the relevant authorities within 24 hours of the incident.

7. Groundwater

The MMM is not currently utilizing groundwater as a primary water supply resource for the supply of potable water to Bloemfontein. Groundwater is only used by individuals for irrigation of gardens and residential areas as well as small industries and micro irrigation for nurseries and garden centres. Groundwater is only used for agriculture towards the south-western areas (i.e. Bainsvlei & Kalkveld). The Bloemfontein area is located in a minor aquifer region which is a moderately-yielding aquifer system of variable water quality (DWA, 2013).

Potential impacts on groundwater:

- Contamination as a result of spillages of hazardous substances.
- Incorrect storage of waste products on the site may result in the contamination of the groundwater.
- Potential impact on the groundwater quantity as groundwater will be abstracted during and for the development. The applicant must remain within the water abstraction limits as designated in the water use right.
- The development of the chicken layer houses will induce surface runoff and therefore reduce infiltration. Lower infiltration will lead to lower groundwater recharge.
- Deep excavation on the site may extend beyond the water table which will result in an impact on groundwater. However, it is not expected that this impact will occur as the proposed area is not known for shallow aquifers and the depth of the quarry will not exceed a few meters.

Impacts	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Pollution of Groundwater	2	4	3	3	3	3	3	9
MITIGATED	2	3	2	2.3	2	2	2	4.6
Decrease in Groundwater availability	3	4	2	3	3	3	3	9
MITIGATED	2	3	2	2.3	2	2	2	4.6

The potential impacts that might occur will occur as a result of contamination of groundwater from spillages and mismanagement of hydrocarbons and potentially hazardous substances. Due to the volumes of potentially hazardous substances being used on the site it is not expected that there is a significant risk of contamination of groundwater. The proposed project will impact infiltration of water and thus the recharge of groundwater as the concrete structures and infrastructure will result in a greater runoff velocity of surface water from the site and less time for water to seep. The footprint of the project is small though and the impact on infiltration rates is expected to be minimal. The significance of

the impacts will be Low-Moderate before mitigation and Low with the implementation of mitigation measures.

Proposed mitigation:

- Spillages of any potentially hazardous substances should be cleaned by removing the spill and the contaminated soil and disposing thereof as hazardous waste.
- Potentially hazardous substances will be stored on an impermeable surface inside a bunded area to prevent seepage of the substance and pollution of the groundwater.

8. Air quality and Noise

The proposed development is planned outside an urban area approximately 17km south west of Bloemfontein along the R706 and is situated within an agricultural area. The proposed site was host to a previous quarry which the current landowner (the applicant) intends to extend upon in this application for a mining permit. The nearest surrounding farmhouse to the proposed quarry is approximately 1.4km north west with another farmhouse 1.5km to the east. The proposed access road through portion 2 of Farm Kwestiefontein 679 passes by the farmhouse and storehouses of the farm in question. The applicant has agreed to maintain and upgrade the access road and will limit the emissions of dust as a result of the proposed operation

Noise levels in the area are also relatively low. Noises are primarily associated with agricultural activities upon the farm and surrounding farms. During the construction phase there will be an impact on the air quality as a result of dust emissions from clearance of vegetation, construction activities and movement of machinery and vehicle movement on site. The construction activities will also have an impact on the ambient noise in the area.

- The burning of waste product, especially plastic would have an impact on the air quality.
- During the operational phase the impact on dust emissions should be very low.

Alternatives	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Impact on Air Quality	2	3	2	2.7	3	3	3	8.1
MITIGATED	2	2	1	1.7	2	2	2	3.4
Impact on Noise	2	3	2	2.3	2	3	2.5	5.75
MITIGATED	2	2	2	2	2	2	2	4

There will be a daily increase in emissions and dust to the atmosphere during operation at the proposed site. There will therefore be an impact on the atmosphere as well as elevated noise levels during the operational phase. There are no other developments or activities in the area responsible for elevated noise levels. The overall impact on air quality and noise will be Moderate -Low before mitigation. With the relevant mitigation the effects will be Low.

Proposed mitigation:

- Dust suppression such as spraying of water should be implemented on the site to reduce emissions of dust from the site, especially after the clearance of vegetation from the site.
- Operational activities, especially activities contributing to dust emissions should be avoided during windy conditions.
- Transport and loader trucks as well as other vehicles and machinery will be equipped with the necessary silencers to reduce noise levels during construction. Vehicles and equipment will also be serviced and maintained to reduce emissions to the atmosphere.
- Vehicles movement and speeds at which vehicles travel on the site will be kept to a minimum and below 45km/h during operations.
- Waste will not be burned on site and open fires during construction will not be permitted.
- Construction activities contributing to elevated noise levels will be restricted to normal working hours between 7am and 5pm.
- A complaints register will be made available for surrounding land users to ensure that noise levels are kept to a minimum during operational hours.

9. Archaeological and Cultural Resources

Dr. Lloyd Rossouw conducted a phase 1 Heritage Impact Assessment (HIA) which results can be seen in appendix C of the Basic Assessment Report (BAR) submitted to the Department of Mineral Resources (DMR). Dr. Rossouw indicated that the potential archaeological impact on the site is considered to be non-existent with regard to in-situ Stone Age remains, graves and graveyards or structures of historical significance. It was also indicated that the probability of palaeontological impact on superficial sediments at the proposed site is regarded as improbable as the paleontologically significant rocks is buffered by a well-developed superficial overburden.

Potential impacts on archaeological and paleontological resources:

- Unearthing and destruction of palaeontological significant artefacts/fossils.

Alternatives	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Impact on archaeological resources	2	3	3	2.7	3	2	2.5	6.75
MITIGATED	1	2	2	1.7	2	2	2	3.4
Impact on Cultural resources	2	3	3	2.7	3	2	2.5	6.75
MITIGATED	1	2	2	1.7	3	2	2.5	3.4

The significance of impacts on archaeological and cultural resources will be low-moderate without mitigation but can be considered Low with mitigation.

Proposed mitigation:

- If any items of archaeological significance be unearthed a heritage specialist will be contacted to investigate and the SAHRA will be notified.

10. Visual exposure (Aesthetic impact)

The proposed development is planned outside an urban area approximately 17km south west of Bloemfontein along the R706 and is situated within an agricultural area. The proposed site was host to a previous quarry which the current landowner (the applicant) intends to extend upon in this application for a mining permit.

The nearest surrounding farmhouse to the proposed quarry is approximately 1.4km north west with another farmhouse 1.5km to the east. The proposed access road through portion 2 of Farm Kwestiefontein 679 passes by the farmhouse and storehouses of the farm in question. The applicant has agreed to maintain and upgrade the access road and will limit the emissions of dust as a result of the proposed operation.

Possible impacts include:

- The operational phase of the project will have a negative aesthetic impact on the surrounding land users as it will involve the operation of a quarry whereas the surrounding land use is agricultural and rural.

Alternatives	Severity	Duration	Extent	Consequence	Probability	Frequency	Likelihood	Significance
Site Alternative								
Impact on aesthetics	2	3	3	2.7	3	2	2.5	6.75
MITIGATED	1	2	2	1.7	3	2	2.5	4.25

The aesthetic impact of the proposed project will be Low-Moderate and can be reduced to a Low impact rating if the correct mitigation and management measures are implemented.

Proposed mitigation:

- The applicant should ensure that only the area applied for is influenced by the quarry operation and that the loader trucks accessing the quarry comply with all speed limits imposed for the operation.
- The site should be cleaned of any waste regularly to minimise the negative visual impact.

11. Demographics and Regional socio-economic structure

According to the reviewed integrated development plan 2016 – 17, about 50 000 people relocated from Botshabelo to Bloemfontein between 2007 to 2011. As a result of this, Bloemfontein now houses almost two thirds of the entire Mangaung Population. During the timeframe of 2001 to 2012, the unemployment rate of Mangaung grew from 69 536 to 73 877 which represents an increase of 6.2% in the unemployment range. During the same timeframe illiteracy and no schooling decreased from 10, 1% in 1996 to 4, 3% in 2011. People with matric have increased from 18, 7% to 30.1% in 2011 (MMM, 2016).

Design, construction, operation and recycling initiatives of the development may generate new job opportunities in most job sectors.

The development will have a positive impact on the socio-economics of the area. Direct and indirect jobs will be created during the construction phase. These jobs will include the building of the structures and infrastructure. Indirect jobs include the small businesses in the area which will provide building material to the applicant.

CONCLUSION AND MOTIVATION FOR PROPOSED ALTERNATIVES

In support of a mining permit and environmental authorisation application for the establishment of a quarry on remainder of farm De Hoop 320, Bloemfontein, Free State

The proposed project involves the application for a mining permit to establish a quarry on the remainder of Farm De hoop 320 which is located approximately 17km south west of Bloemfontein. The proposed quarry will be for the mining of dolerite for gravel material which is commonly used in the construction industry in the region. The total size of proposed project will not exceed 5 ha. The operation of the quarry will make use of an excavator that will extract the material (i.e. the dolerite) which will then be loaded on trucks and transported away. No blasting and crushing will take place at the quarry and all excavating will be done by the excavator. No crusher will be present at the site. The project will make use of water for dust suppression which the applicant will source from groundwater on the farm where the site is located, for which a license is already held by the applicant. The following has been considered in this impact assessment:

- All variables like current property owners, geology, surface and groundwater, air quality, plant & animal life, archaeological and cultural significance and visual exposure were taken into account during the assessment process.
- Lowest clearance of vegetation if possible.
- Proposed development will create job opportunities during the construction period with future jobs becoming available once the project is completed.
- Development will increase supply of dolerite gravel material in the region for which there is high demand and a current shortage.
- Development will have a positive contribution towards the socio-economic and economic spheres of Mangaung Metropolitan Municipality.

The ecological and wetland study done by Mr. Darius van Rensburg, obtainable under appendix C, also indicated that the ecological value of the proposed site is low.

The Phase 1 Heritage Impact Assessment compiled by Mr Llyod Rossouw, obtainable under appendix C, indicated that the archaeological and paleontological value of the proposed site is low

Impacts associated with the proposed project as indicated in the Impact Assessment:

The likelihood of the expected impacts actually occurring will be small and limited if all the recommended mitigation measures are implemented throughout all the phases of the project.

In conclusion, if all the recommended measures are implemented, the significance of the impacts expected to be associated with the proposed activity will be low.

Discussion on the 'no-go' alternatives:

No environmental impact will occur if the no-go alternative is decided on. The opportunity to create employment opportunities and make a positive contribution to the socio-economic situation of the area will be lost.

Based on the above findings the proposed development should be considered.

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