



GA Environment



QUARRY 6A- FINAL ENVIRONMENTAL IMPACT REPORT

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED MINING OF QUARRY 6A ASSOCIATED WITH THE UPGRADE OF NATIONAL ROAD R573 (MOLOTO ROAD), GAUTENG PROVINCE
DMRE REFERENCE NUMBER: GP 30/5/1/1/2/ (00002) BP

July 2021



Environmental best practice, safety and sustainability

FINAL ENVIRONMENTAL IMPACT REPORT
for

**THE PROPOSED MINING OF QUARRY 6A ASSOCIATED WITH THE UPGRADE OF NATIONAL ROAD R573
(MOLOTO ROAD), GAUTENG PROVINCE**

Prepared for:

South African National Roads Agency SOC Ltd
38 Ida Street, Menlo Park
Pretoria

Submitted to:

Department of Mineral Resources and Energy
Mineralia Building, Cnr De Korte and De Beer Street,
Braamfontein

Prepared by:

GA Environment (Pty) Ltd
P.O. Box 6723
Halfway House,
MIDRAND
1685
Tel. No.: (011) 312 2537
Fax. No.: (011) 805 1950
e-mail: environment@gaenvironment.com

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PROJECT INFORMATION

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Competent Authority: Department of Mineral Resources and Energy

Reference No.: GP 30/5/1/1/2/ (00002) BP

Applicant: South African National Roads Agency SOC Ltd

Environmental Assessment Practitioner: GA Environment (Pty) Ltd.

Compiled by: Kirthi Peramaul




Reviewer: Dirk Prinsloo

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SIGNING OF THE ORIGINAL DOCUMENT

Original	Prepared by	Reviewed by	Approved by
Date: 8th July 2021	Name: Kirthi Peramaul	Name: Nkhensani Khandhela	Name: Nkhensani Khandhela
Version 1	Signature: 	Signature: 	Signature: 

DISTRIBUTION LIST

Name	Organisation	Designation
Martin Boonstra	KBK Engineers	Technical Director
Riaan Oerlemans	SANRAL	Project Manager: Design & Construction
Nkosinathi Mahlaba	Department of Mineral Resources and Energy	DMRE Case Officer

Table of Contents

PART A	17
SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT	17
a) Details of	17
b) Description of the property.	18
c) Locality map	18
d) Description of the scope of the proposed overall activity.....	18
e) Policy and Legislative Context	27
f) Need and desirability of the proposed activities.....	35
g) Motivation for the preferred development footprint within the approved site including a full description of the process followed to reach the proposed development footprint within the approved site.	35
h) Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (In respect of the final site layout plan) through the life of the activity.....	96
i) Assessment of each identified potentially significant impact and risk.....	97
j) Summary of specialist reports.....	101
k) Environmental impact statement.....	106
l) Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr;.....	107
m) Final proposed alternatives.	108
n) Aspects for inclusion as conditions of Authorisation.	108
o) Description of any assumptions, uncertainties and gaps in knowledge.....	109
p) Reasoned opinion as to whether the proposed activity should or should not be authorised..	109
q) Period for which the Environmental Authorisation is required.	111
r) Undertaking	111
s) Financial Provision	111
t) Deviations from the approved scoping report and plan of study.....	111
u) Other Information required by the competent Authority	111
v) Other matters required in terms of sections 24(4) (a) and (b) of the Act.	112
PART B	113
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT	113
c) Composite Map	113
d) Description of Impact management objectives including management statements	113
e) Impact Management Outcomes	125
f) Impact Management Actions.....	127
g) Monitoring of Impact Management Actions.....	130
h) Monitoring and reporting frequency	130
i) Responsible persons.....	130
j) Time period for implementing impact management actions	130
k) Mechanism for monitoring compliance	130

l) Indicate the frequency of the submission of the performance assessment report.	131
m) Environmental Awareness Plan	131
n) Specific information required by the Competent Authority.....	131

List of Figures

Figure 1: Project Locality Map	18
Figure 2: Railway access road north of the site	20
Figure 3: Access to the Site gained from Maroela Road	20
Figure 4: Proposed infrastructure Areas on the Proposed Study Area	21
Figure 5: Quarry and Borrow pit sites identified.....	37
Figure 6: Quarry and Borrow Pit sites where material investigation was undertaken	38
Figure 7: Layout Alternative 1 (KBK Engineers, 2021)	39
Figure 8: Layout Alternative 2 (Preferred) (KBK Engineers, 2021).....	40
Figure 9: Average temperature for Pretoria (weather-atlas)	54
Figure 10: Average Rainfall for Pretoria (weather-atlas)	54
Figure 11: Google Earth elevation profile through the project area (shown in red) from north to south	55
Figure 12: Regional Geology Quarry 6A (Soilkraft cc, 2019).....	56
Figure 13: Gauteng C-Plan of the Study Area	57
Figure 14: Vegetation in relation to the project Area	58
Figure 15: Habitat Units Identified.....	58
Figure 16: Representative photographs of the Rocky Bushveld Habitat unit	60
Figure 17: Representative photo's of the rocky outcrop habitat	60
Figure 18: Representative photo's of the open thornveld habitat unit	61
Figure 19: Representative photographs of the Wetland habitat unit within the northeast (top) and to the northwest of the project area (bottom)	61
Figure 20: Representative photographs of the Modified Thornveld habitat unit associated with the historical agricultural fields	62
Figure 21: Representative photographs of the Modified Thornveld habitat unit associated with the disused quarry.....	63
Figure 22: Terrestrial Ecological Sensitivity Map for Quarry 6A	63
Figure 23: The location of the project area in relation to areas of increased biodiversity importance in terms of the Mining and Biodiversity Guidelines (2012)	64
Figure 24: Quarry 6A EMF Map.....	65
Figure 25: Quarry 6A Agricultural Potential Map	66
Figure 26: Historical aerial photograph dated 1980, showing areas utilised for agricultural purposes and quarrying activities during this time (Field and Form Landscape Science, 2021)	67
Figure 27: Watercourses and the DWS Regulated Area	68
Figure 28: Palaeontological Sensitivity Map (SAHRIS)	69
Figure 29: Ward 87 Demographics (https://wazimap.co.za/profiles/ward-87)	70
Figure 30: Ward 87 Employment and Income Statistics (https://wazimap.co.za/profiles/ward-87)	70
Figure 31: Ward 87 Housing and Service Delivery	71
Figure 32: Environmental Sensitivity Map.....	72
Figure 33: Infrastructure identified on site.....	73
Figure 34: Landcover Map	74
Figure 35: Final Site Layout Map	107
Figure 36: Composite Map.....	113

List of Tables

Table 1: Description of Mine Types	22
Table 2: Listed Activities in terms of NEMA EIA Regulations, 2014 as amended	23
Table 3: Policy and Legislative Context	27
Table 4: Results from the Material Investigation	36
Table 5: Summaries of issues raised by I&APs	45
Table 6: Habitat Units Identified within the Study Area (Field and Form:2020)	59
Table 7: Gauteng Environmental Management Framework Zones	65
Table 8: Palaeontological Sensitivity Index.....	68
Table 9: Impact rating for change in topography	75
Table 10: Impact rating for the removal of Geological material	75
Table 11: Impact Ratings for the loss of floral and faunal habitat	76
Table 12: Impact ratings for the loss of floral species diversity and floral SCC	78
Table 13: Impact Ratings for the Loss of Faunal Species and disturbance to Faunal Communities ...	79
Table 14: Potential Impacts of soil compaction and contamination	80
Table 15: Impact ratings for land capability	81
Table 16: Impact Ratings for surface water resources	82
Table 17: Impact ratings for groundwater resources	83
Table 18: Impact ratings for air quality	84
Table 19: Impact ratings for noise and blasting hazards	85
Table 20: Impact ratings for traffic impacts	86
Table 21: Impact ratings for Visual and Aesthetic Impacts	87
Table 22: Impact Ratings for Cultural and Heritage Impacts	87
Table 23: Impact Ratings for Socio-Economic Impacts	89
Table 24: Impact Ratings for the Waste	89
Table 25: Impact Ratings for Safety	90
Table 26: Project phases in a development	91
Table 27: Assessment Criteria	92
Table 28: Assessment of each identified potentially significant impact and risk	97
Table 29: Summary of Specialist Reports	101
Table 30: DEFF Screening Tool, Summary of discussions regarding the undertaking of Specialist Assessments	103
Table 31: Impacts to be Mitigated in their respective phases	116
Table 32: Impact Management Outcomes	125
Table 33: Impact Management Actions	127
Table 34: Mechanisms for monitoring compliance	130

AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I **Kirthi Peramaul**, an EAP employed by **GA Environment (Pty) Ltd** declare that the information provided in this report is correct and relevant to the activity/ project, that comments from Interested and Affected Parties have been incorporated into this report, that the report has included inputs from Specialists and that all relevant project information was made available to Interested and Affected Parties.

**SIGNATURE OF EAP**8th July 2021**DATE**

The EAP affirmation is attached to **Appendix A**.

LIST OF ABBREVIATIONS / ACRONYMS

CBA	Critical Biodiversity Area
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EAPASA	Environmental Assessment Practitioners Association of South Africa
ESA	Ecological Support Area
CA	Competent Authority
COT	City of Tshwane
DEFF	Department of Environment, Forestry and Fisheries
DFFE	Department of Forestry Fisheries and Environment
DSR	Draft Scoping Report
DEIR	Draft Environmental Impact Report
DWS	Department of Water and Sanitation
GDARD	Gauteng Department of Agriculture and Rural Development
EMPR	Environmental Management Programme
FSR	Final Scoping Report
I&APs	Interested and Affected Parties
NFEPA	National Freshwater Ecosystem Protected Area
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)
PPP	Public Participation Process
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework

GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report.

Term	Definition
Alien Invasive Species	Species of plants, animals or other organisms that are not indigenous to a region and which easily spread and destroy the indigenous plant species, taking over an area and causing biological and socio-economic harm.
Borrow Pit	An area where material usually soil, gravel, sand, or weathered rock, has been dug for use as a natural granular material for use in road construction.
Buffer	A strip of land surrounding a wetland or riparian area in which activities are controlled or restricted
Scoping and EIA Process	An environmental assessment process that is undertaken in line with Listing Notices 1 and 2 the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Competent Authority	An organ of state charged by the National Environmental Management Act (NEMA) with evaluating the environmental impact of an activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity.
Conservation Plan Areas (C-Plan Areas)-	<p>A tool developed by the Gauteng Department of Agriculture and Rural Development (GDARD) to identify sensitive areas. The main purposes of this tool is to:</p> <ul style="list-style-type: none"> • serve as the primary decision support tool for the biodiversity component of the Environmental Impact Assessment (EIA) process; • inform protected area expansion and biodiversity stewardship programmes in the province; and serve as a basis for development of Bioregional Plans in municipalities within the province. <p>Some of the aspects that inform the identification of C-Plan Areas include Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESA's), Watercourses, Ridges, Protected Areas, etc</p>
Critical Biodiversity Area	Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection.
Cultural significance	means aesthetic, architectural, historical, scientific, social, spiritual, linguistic, or technological value or significance.
Development	means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthworks or borrow pits, that is necessary for the undertaking of a listed or specified activity, but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Ecological Support Area	Areas that support the ecological functioning of protected areas or CBAs or provide important ecological infrastructure.
Environmental Assessment Practitioner	individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instruments introduced through regulations.
Environmental Authorisation	This is a decision by a Competent Authority to authorise a listed activity in terms of the National Environmental Management Act (NEMA). The authorisation means that a project, either in totality or partially, can commence subject to certain conditions. The Competent Authority has a right to refuse to grant authorisation for a project in totality or partially.
Environmental Impact Assessment Process:	An environmental assessment process that is undertaken in line with Listing Notice 2 the NEMA EIA Regulations with the aim of obtaining Environmental Authorisation.
Environmental Management Programme:	A programme with set objectives and timeframes that seek to achieve a required end state and describes how activities that have or could have an adverse impact on the environment will be mitigated, controlled and monitored.
Flora	plant life that occurs in a specific geographical region and/habitat.
Fauna	animal life that occurs in a specific geographical region and/habitat.
Heritage Resource	means any place or object of cultural significance.

Term	Definition
Indigenous Vegetation	plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.
Interested and Affected Party	in relation to an application for Environmental Authorisation, this refers to an interested and affected party whose name is recorded in the register opened for that application in terms of regulation 42 of the NEMA EIA Regulations. This party will ideally be interested in the development but also affected by the proposed application and have a certain interest in the application.
Quarry	An open excavation from where rock is obtained, usually by blasting, in order to produce rock aggregate for use in road construction.
Regulated area of a watercourse:	<ul style="list-style-type: none"> • The outer edge of the 1:100-year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam; • In the absence of a determined 1:100-year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act); • 500m radius from the delineated boundary of any wetland or pan.
Threatened or Protected Species	These refers to either plants or animals that are at a threat of Extinction or are protected due to their high conservation value or national importance.
Watercourse	(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, lake or dam into which, or from which, water flows; and (d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks;
Wetland	land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

Appendices

Appendix A: EAP Details & Affirmation

Appendix B: Site Maps

Appendix C: Site Plans

Appendix D: Public Participation

Appendix D1: Notification Letter

Appendix D2: Newspaper Advert

Appendix D3: Site Notice

Appendix D4: I&AP database

Appendix D5: Comments and Response Report

Appendix D6: Focus Group Meetings

Appendix D7: Correspondence with I&APs

Appendix D8: Correspondence with Commentary Authorities

Appendix D9: Knock and Drop Register

Appendix E: Correspondence with the Competent Authority

Appendix F: Specialist Reports

Appendix G: Environmental Management Programme & Management Plans

Appendix H: DEFF Screening Tool

1. IMPORTANT NOTICE

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

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

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

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

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

2. OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

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

- (a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- (b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- (c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- (d) determine the—
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
 - (ii) degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be avoided, managed or mitigated;
- (e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- (f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- (g) identify suitable measures to manage, avoid or mitigate identified impacts; and
- (h) identify residual risks that need to be managed and monitored.

PART A
SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT
REPORT

3. Contact Person and correspondence address

a) Details of

i) Details of the EAP

Name of The Practitioner: Kirthi Peramaul

Tel No.: 011 312 2537

Fax No. : 011 805 1950

e-mail address: environment@gaenvironment.com/ kirthip@gaenvironment.com

ii) Expertise of the EAP.

(1) The qualifications of the EAP

Mrs Peramaul holds a BSc (Hons) degree in Environmental Monitoring and Modelling. She is currently registered with the South African Council of Natural Scientific Professions (SACNASP) as a Professional Natural Scientist (Registration No 400012/18: Environmental Science) and as a Registered Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No 2020/1537). The qualifications are attached to **Appendix A** of this report.

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

(In carrying out the Environmental Impact Assessment Procedure)

Mrs Peramaul is an Environmental Assessment Practitioner with twelve (12) years of professional experience in the water and environmental sector. Kirthi specialises in environmental authorisations, environmental compliance monitoring, environmental management plans, water use authorisation, stakeholder engagement, risk assessments and blue and green drop auditing. She has been involved in projects related to Waste Management, Linear Infrastructure, as well as Mixed-Use developments. Her contribution as an auditor in South Africa's incentive-based regulation programmes (blue and green drop) allowed her to be part of water safety planning (water treatment) and the wastewater risk abatement planning processes of various municipalities within South Africa.

b) Description of the property.

Farm Name:	Remainder of Farm Doornpoort 295JR
Application area (Ha)	603 hectares
Magisterial district:	City of Tshwane Metropolitan Municipality
Distance and direction from nearest town	Approximately 22km north east from the Pretoria City Centre
21 digit Surveyor General Code for each farm portion	T0JR0000000029500000

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

The regional setting of the study area indicating the locality of the proposed Quarry 6A is provided in Figure 1.

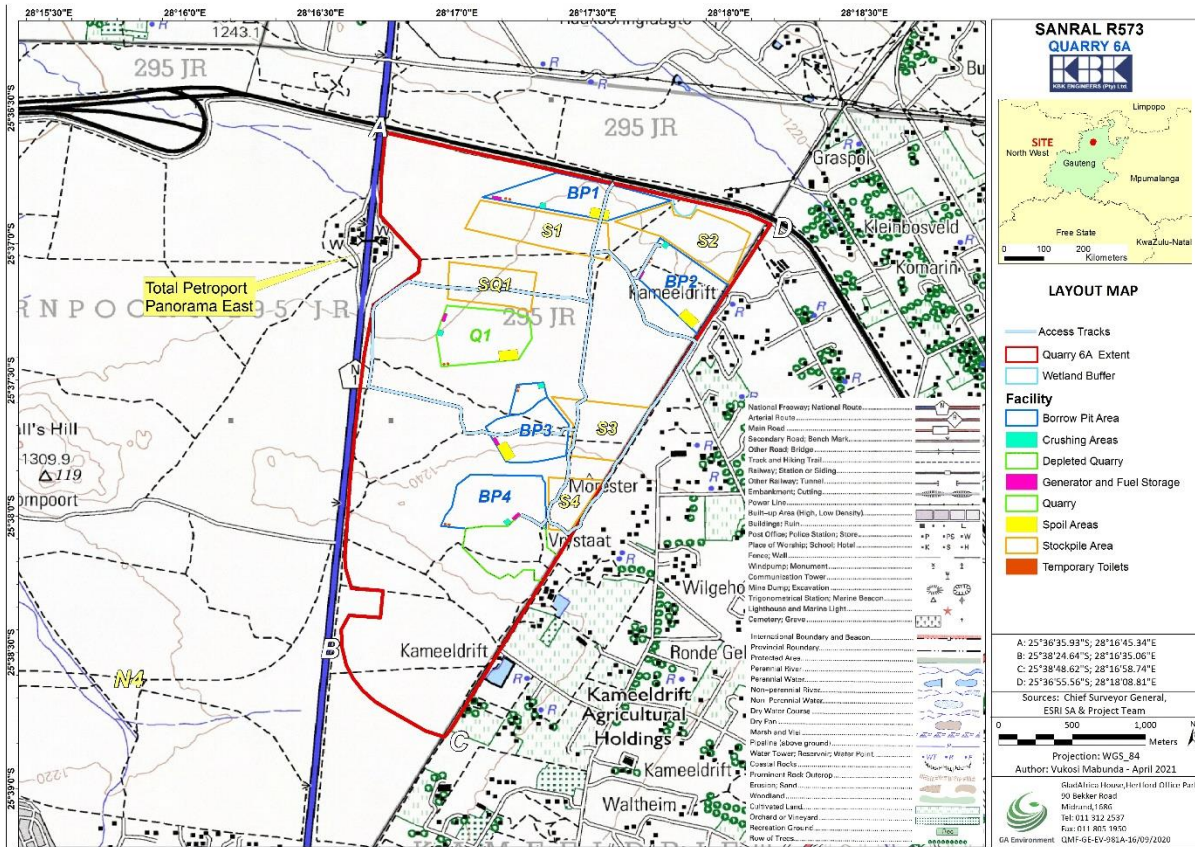


Figure 1: Project Locality Map

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

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

It is noted that in terms of Section 106 of the MPRDA, SANRAL is exempted from applying for a Mining Right to develop a quarry for the purposes of sourcing road building material. However, SANRAL is still

required to obtain Environmental Authorisation in terms of the National Environmental Management Act (107 of 1998).

Project Background

It is the intention of the South African National Roads Agency SOC Ltd to establish various Quarries to provide the necessary construction materials for the proposed upgrading of national road R573-1 (K139) from Baviaanspoort Road in Tshwane (km 0,00) to the Gauteng / Mpumalanga Provincial Border (± 48.00 km). The upgrading of the R573 Moloto Road includes the following projects:

- Upgrading of the entire length of the R573/1 Moloto Road to a 4-lane barrier-divided dual carriageway from Stormvoël Road to the Gauteng border.
- Construction of the southern link between Stormvoël Road and Baviaanspoort Road.
- Construction of the new PWV2 link between the N1/N4 Interchange and the R573/1 Moloto Road.
- Construction of the Moloto/Sefako Makgatho Interchange.
- Construction of the Big Tree Mall Interchange.
- Construction of the De Wagendrift bypass along the R573/1; and
- Various upgrades to local roads and upgrading of intersections to small interchanges (Moepel Overpass; Baviaanspoort Road East extension; Dewar, Sakabuka and Maroela interchanges and road developments).

The SANRAL appointed KBK Engineers to provide engineering services for the proposed development. KBK Engineers appointed GA Environment (Pty) Ltd on behalf of SANRAL as independent Environmental Consultants to undertake the required Environmental approvals for the mining of four Quarries for the purpose of the proposed development. All four Quarries are situated along the R573 Moloto Road and are as follows:

- **Quarry 6A;**
- Quarry 6B;
- Quarry 4 and
- Quarry 5.

This Environmental Impact Report (EIR) serves to present the identified environmental impacts for **Quarry 6A** which is hereafter referred to as the study area. Separate Environmental applications will be submitted for each of the Quarries identified above and will be submitted to the Department of Mineral Resources and Energy (DMRE).

Project Location

The proposed Quarry 6A is located approximately 2.5km to the northwest of the R573 (Moloto Road) roadway, immediately to the northeast of the N1/N4 highway interchange and bordering the N1 highway to the east (**Figure 1**). The site centre geographic coordinates are 25°37'35.67" S, 28°17'08.25" E. The project area is located on the Remainder of the farm Doornpoort 295JR within the City of Tshwane Metropolitan Municipality, Gauteng Province. A Transnet railway line and service road borders the northern boundary of the site. The site can be accessed from the railway service (**Figure 2**) and via Maroela Road through privately owned land (**Figure 3**).



Figure 2: Railway access road north of the site



Figure 3: Access to the Site gained from Maroela Road

Communities in the vicinity of the project area include Doornpoort, Rynoue, Kameeldrift East and Mondustria and Agricultural holdings. The majority of the study area comprises of mostly undeveloped land interspersed with gravel roads and is located within a rural setting characterised by agricultural holdings.

Project Description

The proposed study area where Quarry 6A is located, is considered as a potential source of rock material that can be crushed to produce G1 aggregate and crushed G6 gravel by-products. Approximately 66 000m³ of overburden is to be removed from the Quarry area and stockpiled on site. The Quarry should yield approximately 584 000m³ of unprocessed bedrock material suitable for the production of crushed G1 aggregate and an estimated volume of 114 000m³ of material can be crushed and processed as possible G6 material. The rock material will only be stored temporarily in stockpiles

on site before being crushed and taken off site. The commodity to be mined for the Borrow Pits are gravel and for the Quarry it is aggregates.

It is important to note that the proposed Quarry 6A will include various mining areas that are referred to as Borrow Pits 1, 2, 3, & 4 and Quarry 1. Such referencing has been provided by the Design Engineer for ease of identification of the available material on site. The proposed development of Quarry 6A includes the following proposed infrastructure areas as presented in **Figure 4**:

- **Quarry 6A Borrow Pit 1 (Q6ABP1)** includes a crushing area, a spoil area, a generator and fuel storage area and temporary toilets – 18.74ha;
- **Quarry 6A Stockpile 1 (Q6AS1)**, comprises of a topsoil/ overburden stockpile area – 19.52ha;
- **Quarry 6A Borrow Pit 2 (Q6ABP2)** includes a crushing area, a spoil area, a generator and fuel storage area and temporary toilets – 19.81ha;
- **Quarry 6A Stockpile 2 (Q6AS2)**, comprises of a topsoil/ overburden stockpile area – 17.98ha;
- **Quarry 6A Quarry 1 (Q6AQ1)**, includes a crushing area, a spoil area, a generator and fuel storage area and temporary toilets – 19.46ha;
- **Quarry 6A Quarry Stockpile 1 (Q6AQS1)** comprising a topsoil/ overburden stockpile area – 16.83ha;
- **Quarry 6A Borrow Pit 3 (Q6ABP3)** includes a crushing area, a spoil area, a generator and fuel storage area and temporary toilets – 18.48ha;
- **Quarry 6A Stockpile 3 (Q6AS3)**, comprises of a topsoil/ overburden stockpile area – 15.71ha;
- **Quarry 6A Borrow Pit 4 (Q6ABP4)** includes a crushing area, a spoil area, a generator and fuel storage area and temporary toilets – 19.02ha; and
- **Quarry 6A Stockpile 4 (Q6AS4)**, comprises of a topsoil/ overburden stockpile area – 8.33ha.

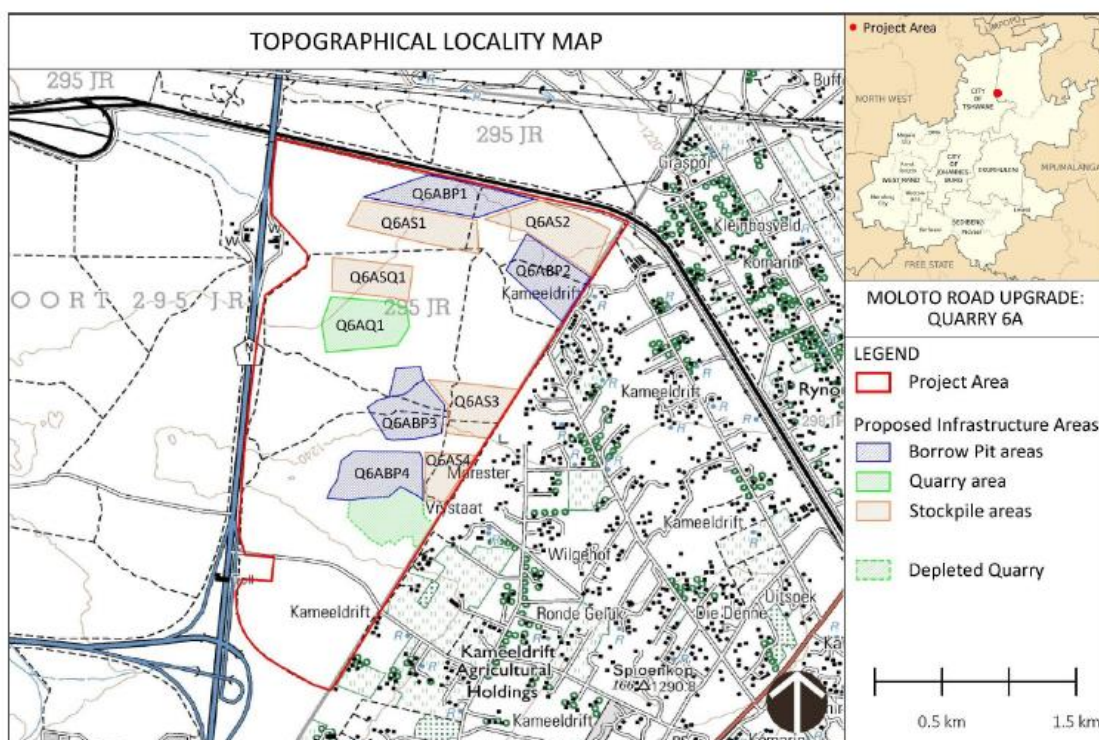


Figure 4: Proposed infrastructure Areas on the Proposed Study Area

For the purposes of the proposed Quarry 6A as depicted in **Figure 4**, Quarry 6A will include four Borrow Pits and one Quarry. In the context of the proposed Quarry 6A, the following terminology applies (**Table 1**).

Table 1: Description of Mine Types

Type of Mine	Description
Quarry	A Quarry can be described as a mining area where rocks are sourced through blasting activities. Such rock is further processed through crushing to produce rock aggregated. The types of material obtained are usually G1 to G3.
Borrow Pit	Material obtained from a borrow pit is usually G4 to G10 which is natural soil and gravel. Such material is usually sourced by an excavator.

The material that will be excavated from the Quarry and Borrow Pits would be processed at the crushing plant which will be situated within the study area. Once processed the material will be stockpiled and transported to the construction sites by haul vehicles. The potential environmental impacts associated with these quarries and borrow pits, crushing areas and spoil areas, generators, fuel storage area and temporary toilets will be assessed in this Environmental study.

(i) Listed and specified activities

In terms of section 24(2) of NEMA, the Minister and or any MEC in concurrence with the Minister may identify activities which require authorisation as these activities may negatively affect the environment. Environmental Impact Assessment (EIA) Regulations were promulgated in December 2014 (as amended) in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998 and consist of the following:

- *Regulation 982* provide details on the processes and procedures to be followed when undertaking an Environmental Authorisation process;
- *Listing Notice 1* (Regulation 983) define activities which will trigger the need for a Basic Assessment process;
- *Listing Notice 2* (Regulation 984) define activities which trigger an Environmental Impact Assessment (EIA) process. If activities from both R 983 and R 984 are triggered, then an EIA process will be required.
- *Listing Notice 3* (Regulations 985) define certain additional listed activities for which a Basic Assessment process would be required within identified geographical areas.

The above regulations were reviewed to determine whether the proposed project will trigger any of the above listed activities, and if so, what Environmental Authorisation Process would be required. The triggered listed activities are presented in **Table 2** will require authorisation in terms of GNR 983 Listing Notice 1, GNR 984 Listing Notice 2 and GNR 985 Listing Notice 3 of the NEMA EIA Regulations (2014), as amended. A Scoping and EIA process will be required to be undertaken in line with all the requirements of the NEMA EIA Regulations, 2014, as amended.

Table 2: Listed Activities in terms of NEMA EIA Regulations, 2014 as amended

NAME OF ACTIVITY (All activities including activities 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.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY Mark with an X where applicable or affected.	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)/NOT LISTED
	201ha	Activity 30 Any process identified in terms of Section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). <p style="text-align: center;">X</p>	Listing Notice 1 (GNR 983) According to the National List of Threatened Terrestrial Ecosystems database (2011), the majority of Quarry 6A, including the northern half and southern portion thereof is located within the original extent of a listed Threatened Ecosystem, namely the Marikana Thornveld Ecosystem (SVcb6). The conservation status of the Marikana Thornveld Ecosystem is Vulnerable (VU) due to irreversible loss of natural habitat and due to the extent of remaining natural habitat in the ecosystem being less than or equal to 60% of the original extent of the ecosystem. This ecosystem has a high risk of undergoing significant degradation of ecological structure, function or composition as a result of human intervention.
	201ha	Activity 15 The clearance of an area of 20 hectares or more of indigenous vegetation <p style="text-align: center;">X</p>	Listing Notice 2 (G.N.R 984) Indigenous vegetation will be cleared for the mining activities, temporary infrastructure and informal access roads or internal tracks.
	100 ha	Activity 12 The clearance of an area of 300 square metres or more of indigenous vegetation	Listing Notice 3 (G.N.R 985) A Critical Biodiversity Area and an Ecological Support Area is situated within the proposed study area. Clearance of indigenous vegetation for the mining

		<p>except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>ii Within critical biodiversity areas identified in bioregional plans; X</p>	<p>activities, temporary infrastructure and informal access roads or internal tracks will be undertaken.</p>
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(ii) Description of the activities to be undertaken

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

Activities associated with the various mining phases

Pre-Mining Phase

Activities associated with the pre-mining phase are provided below:

- The appointed Contractor to develop a method statement for the operation of Quarry 6A
- Determine pre-existing drainage patterns and concentration of flow on the Quarry 6A site
- Site preparation
 - Fencing of Quarry and associated production area.
 - Land clearing.
 - Stripping of topsoil/overburden and temporary stockpiling in areas to be excavated only.

Mining Phase

Activities associated with the mining phase are provided below:

- Excavations
 - The material will be excavated from the Quarry area by the use of an excavator in order to remove required volumes of construction material.
- Processing of Material (crushing and screening)
 - The mined material will be crushed and screened utilising a mobile crushing and screening plant.
- Stockpiling
 - Subsequent to processing all material will be transferred to the demarcated stockpiling area. Specific stockpiles for overburden and topsoil removed during the pre-mining and mining phase, will be stored separately and used as backfilling during the rehabilitation and closure of the borrow area.
- Transferring of material
 - Material required for the upgrade of the R573, will be loaded onto haul vehicles (i.e. tipper trucks) by a front end loader, where the material will then be transported to the necessary construction sites.

Rehabilitation and Closure

The following activities will occur subsequent to the mining phase:

- All infrastructure (fences, site offices), mining equipment (crushers, screens, haul vehicles) will be removed from site.
- All waste/rubble will be removed from site.
- Overburden stockpiles from the mining phase will be used for the filling of the Quarry.
- Site Stabilisation
 - The Quarry area will be graded, revegetated and grassed in order to blend with surrounding environment.
- Closure
 - The site will be rehabilitated and left in an environmentally acceptable state. A closure plan will also be required for the proposed Quarry. The closure plan will ensure that the borrow area is rehabilitated, and that after closure of the area, vegetation establishes effectively.

For the purpose of this report and the impact assessment undertaken, the pre-mining phase will be referred to as the construction phase and the mining phase will be referred to as the operational phase. Such terminology is in line with the specialist studies undertaken.

Access Roads

It is the intention of SANRAL to use the railway maintenance track towards the north of the site as the main haulage route. Should the route not be sufficient for the haulage of material, SANRAL will consider

alternative routes such as Tamboti Road, Maroela Road, along the proposed PWV2 alignment (adjacent to the Kameeldrift police station) as well as additional internal road links. Public roads that will be used for the haulage of material will be maintained as needed during material production. No new access roads will be constructed for the haulage of material to the respective sites as access to site already exists. The potential impacts resulting from the haulage of material to the respective sites has also been addressed in this EIR. Internal access roads within the project footprint will follow existing access tracks. Certain existing access tracks will be required to be widened in order to accommodate the haulage vehicles. The widening of the existing tracks will not exceed 4m. According to the Design Engineers, it is not anticipated that any new access roads greater than 4m will be constructed and only one-way traffic will be applicable to these sections. Vegetation clearance will be required for the internal access roads. Potential environmental impacts associated with the internal access roads have been considered in this report. Refer to **Figure 1** showing the internal existing tracks to be used.

Waste Management

All waste generated during the construction and operational phase of the quarry will be temporarily stored at suitable locations (e.g. in receptacles/skips) and will be removed at regular intervals and disposed of appropriately at a licensed municipal waste site or acceptable disposal facility. The nearest landfill is the Bon Accord Landfill which is situated on Lavender Road. The anticipated waste volumes or quantities do not trigger the need to apply for a Waste Licence.

Stormwater Management

The Quarry and Borrow pits will be free draining. Excavations are free draining which means that the angle of the excavation is such that, for example, rainwater, runs freely off the soil into the veldt. Although some water may collect in depressions, during excavation no water needs to be pumped out. A Stormwater Management Plan shall be compiled by the Contractor prior to the commencement of construction activities.

Fuel Storage

A diesel storage area has been accommodated in the site layout. Even though the layout has accommodated the proposed diesel storage area, the storage can only be confirmed once the Contractor has been appointed. However, should diesel be stored on site, the cumulative capacity will be less than 80m³ and will not trigger the need to undertake a Basic Assessment process.

Site Demarcation

The study area will be temporarily fenced off for the entire duration of the project until the site has been completely rehabilitated.

Water and Sanitation

Sanitation services will be required for onsite personnel during the construction and operational phase of the project. Chemical toilets will be used and serviced regularly by a registered Waste Contractor. Water may be required for dust suppression especially during crushing operations. The appointed Contractor responsible for the operation of the Quarry 6A, will be responsible for ensuring that the relevant permits/authorisations are in place based on their assessment of suitable water sources.

e) Policy and Legislative Context

Table 3: 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 (i.e. Where in this document has it been explained how the development complies with and responds to the legislation and policy context)	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g. In terms of the National Water Act:-Water Use Licences has/has not been applied for).
Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)	<p>The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following: <i>"...everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development"</i>.</p> <p>The State must therefore respect, protect, promote, and fulfil the social, economic, and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate.</p>	<p>The issuing of an environmental authorisation or other permits or licence for any aspect of the proposed Quarry 6A will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and socio- economic environment.</p>
National Environmental Management Act, 1998 (Act No. 107 of 1998)	<p>In order to bring section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) into realisation, the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) was promulgated to serve to <i>'provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain</i></p>	<p>The proposed project will trigger listing activities from Listing Notice 1, Listing Notice 2 and Listing Notice 3 of the EIA Regulations as provided in Table 2.</p>

	<p><i>aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith'.</i></p> <p>Chapter 5 of NEMA outlines the general objectives and implementation of Integrated Environmental Management (IEM), which provides a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for granting of Environmental Authorisations. In order to give effect to the general objectives of IEM, the potential impacts on the environment of listed activities must be considered, investigated, assessed, and reported on to the competent authority.</p> <p>Environmental Impact Assessment (EIA) Regulations were promulgated in December 2014 (as amended) in terms of Section 24(5) and Section 44 of the National Environmental Management Act (NEMA), Act 107 of 1998. In terms of the 2014, EIA Regulations the triggered listed activities fall under Listing Notices 1, 2 and 3 which are further discussed as follows:</p> <ul style="list-style-type: none"> • <i>Listing Notice 1 (Regulation 983) define activities which will trigger the need for a Basic Assessment process;</i> • <i>Listing Notice 2 (Regulation 984) define activities which trigger a Scoping and Environmental Impact Assessment (EIA) process.</i> • <i>Listing Notice 3 (Regulations 985) refers to certain listed activities located in specifically defined geographical areas for which a Basic Assessment process would be required.</i> 	
<p>Department of Environment Forestry and Fisheries Screening Tool</p>	<p>On 5 July 2019, The Department of Environment, Forestry and Fisheries gave Notice of the Requirement to submit a Report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from 4 October 2019.</p>	<p>A copy of the DEFF Screening report is provided in Appendix H of this report.</p>
<p>National Environmental Management Act, 1998 (Act No. 107 of 1998).</p> <p>Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for</p>	<p>Specialist reports are required to be undertaken in line with Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes in terms of Sections 24(5)(A) and (H) and 44 of the National Environmental Management Act (NEMA; Act No 107 of 1998) when Applying for Environmental Authorisation, dated 2020 March 2020</p>	<p>The Terrestrial Biodiversity Assessment, undertaken for the proposed project was undertaken in terms of the Protocol for the specialist assessment and impacts on terrestrial biodiversity.</p>

Environmental Authorisation, dated 2020 March 2020		
National Environmental Management: Waste Act 59 of 2008 (Act No. 59 of 2008)	This Act aims to regulate waste management to protect human health and the environment by putting measures in place to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources. The Applicant shall ensure compliance with this Act by implementing practical measures to avoid or reduce unnecessary generation of waste and where the waste is generated measures such as re-using, recycling and recovery of waste shall be encouraged.	A waste licence is not required for the proposed Quarry 6A. The general principles of responsible waste management will be incorporated in the EMPr to manage waste related activities during construction and operational phase of the project.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	<p>The purpose of this Act is to provide for the:</p> <ul style="list-style-type: none"> • Management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; • The protection of species and ecosystems that warrant national protection; • The sustainable use of indigenous biological resources; • The fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; • The establishment and functions of a South African National Biodiversity Institute <p>Chapter 7 of the NEMBA regulations govern the 'PERMIT SYSTEM FOR LISTED THREATENED OR PROTECTED SPECIES'. In order to remove or relocate any Threatened species or Protected species identified on the site, the relevant permits must be applied for.</p>	According to the Terrestrial Biodiversity Assessment undertaken by Field and Form Landscape Science, the proposed Quarry 6A, is located within two vegetation types as defined by Mucina & Rutherford (2006), namely Marikana Thornveld (Endangered) and Norite Koppies Bushveld (Least Threatened). No threatened or protected species was identified within the study area.
National Forests Act, 1998 (Act No 84 of 1998)	<p>The purpose of the Act is to promote the sustainable management and development of forests and to provide protection for certain forests and trees in terms of:</p> <ul style="list-style-type: none"> • Section 15 (1) of the National Forest Act (Act 84 of 1998), any person wishing to cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree must apply for a license from the Minister or any delegated institution or authority. • Government Notice 38215, Notice of the List of Protected Tree Species under the National Forests Act, 1998 (Act No 84 of 1998) was gazetted in November 2014. 	According to the Terrestrial Biodiversity Assessment undertaken by Field and Form Landscape Science, no protected species were noted within the study area.
National Water Act, 1998 (Act No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) aims to provide for management of the national water resources in order to achieve sustainable use of water for the benefit of all water users. This act requires that the quality of	According to the Wetland Assessment undertaken by Limosella Consulting. The assessment revealed one watercourse was recorded in the north of the

	<p>water resources is protected as well as the integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved, and managed in ways which take into account:</p> <ul style="list-style-type: none"> • Meeting basic human needs of present and future generations; • Promoting equitable access to water; • Redressing the results of past racial discrimination; • Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development; • Providing for the growing demand for water use; • Protecting aquatic and associated ecosystems and their biological diversity; • Reducing and preventing pollution and degradation of water resources; • Meeting international obligations; • Promoting dam safety; and • Managing floods and drought. <p>In pursuit of these objectives, Chapter 4 of the act regulates water use, while Section 21 lists eleven water use types that are regulated [Section 21 (a) – (k)]. Watercourses and wetlands are protected in terms of this section, as both are regarded as water resources. The list of the regulated areas inclusive of the 500m distance, but specific to the delineated boundary are as follows:</p> <ul style="list-style-type: none"> • <i>The outer edge of the 1:100 year flood line and /or delineated riparian habitat whichever is the greatest measured from the middle of a river, spring, natural channel, lake or dam;</i> • <i>In the absence of a determined 1:100 year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to section 144 of the Act);</i> • <i>500m radius from the delineated boundary of any wetland or pan.</i> 	<p>study site. This watercourse is classified as an episodic drainage area and is therefore unlikely to exhibit wetness condition all year long. A seepage wetland was also identified north west of the site. A Water Use Authorisation will be required by the Department of Water and Sanitation (DWS) as the proposed Quarry 6A falls within the DWS regulated area.</p>
<p>National Environmental Management Air Quality Act (Act 39 of 2004) -</p>	<p>The purpose of the act is to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto. Section 32 of the Act relates to the control of dust and Section 34 of the Act relates to the control of Noise.</p>	<p>The principles provided in Section 32 and 34 of the Act has been included into the EMP, in order to manage and minimise dust and noise related activities generated during the construction and operational phase of the project.</p> <p>It is further acknowledged that depending on the volumes of diesel that may be required during the</p>

	<p>National Environmental Management Air Quality Act (Act 39 of 2004- <i>Category 2: Subcategory 2.4: Storage and handling of Petroleum Products</i>)</p> <p><i>National Dust Control Regulations (2013)</i></p>	<p>construction phase of the project, diesel tanks may require that an Air Emission Licence be obtained before installations. According to the Air Quality Act “All permanent immobile tanks liquid storage facilities at a single site with a combined storage capacity of greater than 1000m³” require an Air Emission Licence. It is unlikely that the development will install tanks above the listed activity thresholds 1000m³ thus no Basic Assessment or Scoping/EIA will be triggered. Should this be required an AEL will be lodged with the relevant Competent Authority.</p> <p>Based on the information provided, An Air Emission Licence is not required as the anticipated dust that will be released will be managed through the National Dust Control Regulations (2013).</p>
<p>National Heritage Resources Act, 1999 (Act No. 25 of 1999)</p>	<p>The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following</p> <p><i>Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—</i></p> <ul style="list-style-type: none"> <i>(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;</i> <i>(b) the construction of a bridge or similar structure exceeding 50 m in length;</i> <i>(c) any development or other activity which will change the character of a site—</i> <ul style="list-style-type: none"> <i>(i) exceeding 5 000 m2 in extent; or</i> <i>(ii) involving three or more existing erven or subdivisions thereof; or</i> <i>(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or</i> <i>(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;</i> <i>(d) the re-zoning of a site exceeding 10 000 m2 in extent; or</i> <i>(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,</i> <p><i>must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the proposed development.</i></p>	<p>In terms of Section 38 of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), A Heritage Impact Assessment has been undertaken for the proposed Quarry 6A. The findings of the Heritage Impact Assessment are included under Section (iv 1).</p>

Mineral and Petroleum Resource Development Act 28 of 2002	The purpose of the Act is to regulate the prospecting for and the optimal exploitation, processing and utilization of minerals; to regulate the orderly utilization and the rehabilitation of the surface of land during and after prospecting and mining operations; and to provide for matters connected therewith. In terms of Section 22 of the Act, a Mining Right must be obtained prior to the commencement of any mining activities.	It is noted that in terms of Section 106 of the MPRDA, SANRAL is exempted from applying for a Mining Right to develop a quarry for the purposes of sourcing road building material. However, SANRAL is still required to obtain Environmental Authorisation in terms of NEMA.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA)	SPLUMA is a framework act for all spatial planning and land use management legislation in South Africa. It seeks to promote consistency and uniformity in procedures and decision-making in this field. SPLUMA will also assist municipalities to address historical spatial imbalances and the integration of the principles of sustainable development into land use and planning regulatory tools and legislative instruments.	The site earmarked for development is currently zoned as Agricultural. However, the Quarry 6A is temporary in nature and SANRAL will engage with the City of Tshwane to confirm the requirements for re-zoning.
Gauteng Environmental Management Framework	The Gauteng Department of Agriculture and Rural Development have developed an Environmental Management Framework Tool to streamline the requirements for an Environmental Impact Assessment (EIA) and reduce the need for the undertaking of EIA requirements, a reduction in timeframes for approvals and as a contribution towards reducing the cost of doing business in Gauteng. In this tool, a number of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) listed activities are excluded from the requirement to obtain an Environmental Authorisation (EA). Government Notice 164 in Government Gazette No. 41473 of 2 March 2018 presents a list of activities that are excluded from the need to obtain an Environmental Authorisation as they occur within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework (GPEMF).	Majority of the site falls within Zone 1 (urban development zone), and the area situated with the centre of the site falls within Zone 2 (High Control Zone). The proposed site is not considered for exclusion as the site is characterised by two zones as per the EMF.
Gauteng Conservation Plan (C-Plan)	The Gauteng C-Plan focuses on the mapping of biodiversity priority areas within the Gauteng Province and is compiled by the Gauteng Department of Agriculture and Rural Development (GDARD). The C-Plan was consulted in order to determine the location of areas of increased ecological or conservation importance and sensitivity within the vicinity of the study area. This was undertaken by an investigation of biodiversity priority areas which include Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs).	According to the Gauteng Department of Agriculture and Rural Development (GDARD) Conservation Plan data, the central portion of the study area is associated with a Critical Biodiversity Area (CBA), and a portion of the study area along its northern boundary is indicated to fall within an ESA.
Mining and Biodiversity Guidelines (2012)	The intention of the guideline is to find a balance between economic growth and environmental sustainability (i.e. in the name of sustainable development). The Guideline is envisioned as a tool to “foster a strong relationship between biodiversity and mining which will eventually translate into best practice within the mining sector.” In identifying biodiversity priority areas which have different	The Mining and Biodiversity Guidelines (2012) indicates the central portion of the project area to be located within an area of Highest Biodiversity Importance, with several smaller portions in the

	<p>levels of risk against mining, the Guideline categorises biodiversity priority areas into 4 classes with the following levels of risk for mining attached to them:</p> <ol style="list-style-type: none"> 1. Legally protected areas, where mining is prohibited 2. Areas of highest biodiversity importance, which are at the highest risk for mining 3. Areas of high biodiversity importance, which are at a high risk for mining 4. Areas of moderate biodiversity importance, which are at a moderate risk for mining 	north and south of the project area indicated to fall within areas of High Biodiversity Importance.
City of Tshwane Spatial Development Framework (2012)	<p>The vision of the City is to become the African City of Excellence. The purpose of the Spatial Development Framework (SDF) is to provide a spatial representation of the City's vision and to be a tool to integrate all aspects of spatial planning. According to the SDF (2012) the following shall be addressed to achieve the vision of the City:</p> <ul style="list-style-type: none"> • Addressing social need; • Restructuring of a spatial inefficient City • Promotion of sustainable use of land resources • Strategic direction around infrastructure provision; • Creating opportunities for both rural and urban areas; • Guiding developers and investors as to appropriate investment localities; • Rural Management programmes to improve livelihoods and stimulate employment <p>An implementation mechanism for the for the municipal SDF was developed by the City. One of the mechanisms being the compilation of Regional Spatial Development Frameworks for each of the City's seven regions. The proposed project falls within Region 5 of the city. One of the key opportunities as identified in the regional SDF is transport. The Moloto Road corridor project has been identified as a strategic road link of the region.</p>	The proposed Quarry 6A is for the sourcing of Material for the R573 Moloto Road upgrade. The proposed Quarry 6A will therefore support the strategic objectives and will contribute to improved mobility with the region.
Occupational Health and Safety Act (85 of 1993), Major Hazard Installation Regulations (GNR 629, 30 July 2001).	Any use or ancillary activity that involves the storage or keeping of hazardous substances that may result in an installation being declared a major hazardous installation in terms of occupational health and safety law is not permitted, unless a risk management and prevention plan has been submitted by the owner, and the City has given approval thereto.	It cannot be confirmed within the Environmental scope work if diesel storage will be undertaken on site and if such constitutes a Major Hazardous Installation. It is strongly recommended that SANRAL sought input from Health and Safety specialist with regard to this aspect and the City of Tshwane Fire Brigade Service bylaws are adhered to.

In addition to the above-mentioned legislative requirements, the upgrading of the R573 Moloto Road is a Strategic Infrastructure Project (SIP). SIP's are coordinated by the Presidential Infrastructure Coordinating Commission (PICC). The PICC has identified 18 SIPs to regenerate the South African economy. The upgrading of the Moloto Road projects falls under SIP 1: Unlocking the northern mineral belt with Waterberg as the catalyst, which includes the development of a logistics corridor to connect Gauteng with Mpumalanga. The SIP application has been included with this EIA Application.

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 Quarry 6A will supply construction material for the proposed upgrading of National road R573-1 (K139) from Stormvoël Road in Tshwane (km 0,00) to the Gauteng / Mpumalanga Provincial Border (\pm 48.00 km). The rationale for the proposed upgrade is provided below:

- The R573 Moloto Road is one of South Africa's busiest and most important economic routes connecting Gauteng, Mpumalanga, and Limpopo provinces with an extremely high number of buses and light motor vehicles. The road links small towns and rural settlements with Pretoria and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function (KBK Engineers, 2020).
- The road has been dubbed the "road of death" due to the high number of accidents that has happened on it over the years. According to the media release issued on the 31st July 2018 by Pretoria News, the Moloto road has not been upgraded for many years and has been exposed to increasing traffic over the years. Statistics taken from a period of 29 months, January 2012 to May 2014, show that there were 489 crashes on Moloto Road, resulting in 158 fatalities and 594 serious injuries (iol, 2018).
- In order to address safety, mobility functions and ensure that reasonable access is provided to adjacent properties and areas to enable the future land use development, SANRAL is proposing the upgrade of the R573 Moloto Road.

Large volumes of construction material would be required for the proposed project, hence the development of a local source of material would be highly beneficial. Obtaining the required quality and quantity of material from commercial sources would not be financially viable. Substantial cost savings would result by eliminating the cost of procurement and transportation of large volumes of material from existing commercial sources. Material investigations have also revealed that the proposed study area holds material reserves to meet the project requirements in conjunction with various other sites as provided in **Section 3 (i)** of the report. In addition, the study area was previously mined for the purpose of road materials for the N1 and the proposed site falls within close proximity of the proposed road upgrades. Such will avoid potential risks associated with road safety on the surrounding road networks and carbon emissions as the distance travelled by the haul vehicles will be reduced

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

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

Quarry 6A is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The site is relatively undeveloped with a depleted Quarry towards the south east. The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573.

(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;

According to the design engineers (KBK Engineers), six (6) potential Quarry sites and eight (8) Borrow Pits sites were identified following a geotechnical desktop study (**Figure 5**). As majority

of the R573 Moloto Road is bordered by residences or small holdings (extensively inhabited areas in general), areas for safe reliable quarrying were severely limited. Many of the sites presented in **Figure 5** were eliminated following an environmental screening process which also involved discussions with the landowners. Due to the difficulty in procuring the land, various other sites were identified and investigated by geotechnical drilling (**Figure 6**). The results of the site investigations are presented in **Table 4** below. From the eight sites that were investigated only four of them were feasible. It is important to note that separate environmental Authorisation process is currently underway for each of the preferred sites, highlighted in grey in **Table 4**.

Table 4: Results from the Material Investigation

Site	Material Source	Coordinates	Suitability
Borrow Pit 4	N/A	25° 28' 43.2"S 28° 36' 16.3"E	Material is not suitable for proposed use and was not investigated any further.
Borrow Pit 6	G7 & G9	25° 38' 29.6"S	The site holds significant potential to supply gravel material. However additional provision must be made for excavation aids and material crushing in order to achieve sufficient borrow pit depths to produce the estimated material volumes.
Borrow Pit 6 additional area	G9	28° 17' 09.6"E	
Borrow Pit 7	G7	25° 36' 46.4"S 28° 17' 34.7"E	The site holds potential to supply gravel material. However additional provision must be made for excavation aids and material crushing in order to achieve sufficient borrow pit depths to produce the estimated material volumes.
Borrow Pit 8	N/A	25° 30' 36.3"S 28° 31' 46.0"E.	Material and environmental (i.e. possible wetland) restrictions make this site unsuitable.
Quarry 4	G1 & G7	25° 28' 43.2"S 28° 36' 16.3"E.	Pivotal source of G1 and G7 material produced from crushed rock to service the northern half of the project.
Quarry 5	G5, G6, G7	25° 32' 05.5"S 28° 30' 59.4"E.	This quarry is the only material source proven to hold large volumes of G5 crushed rock material which will be vital. The source should be dedicated to producing crushed G5 material (and G6 by-products).
Quarry 6.4/6B	G1, G5 & G6	25° 36' 31.9"S 28° 15' 31.3"E.	Quarry 6.4/6B is the largest source of G1 material for this project and benefits from G5 and G6 by-products.
Quarry 6.5/6A	G1 and G6	25° 36' 46.4"S 28° 17' 34.7"E.	Quarry 6.5/6A is a viable source of G1 material, with proven supplementary G6 by-products to be produced from crushing overburden materials.

The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573.

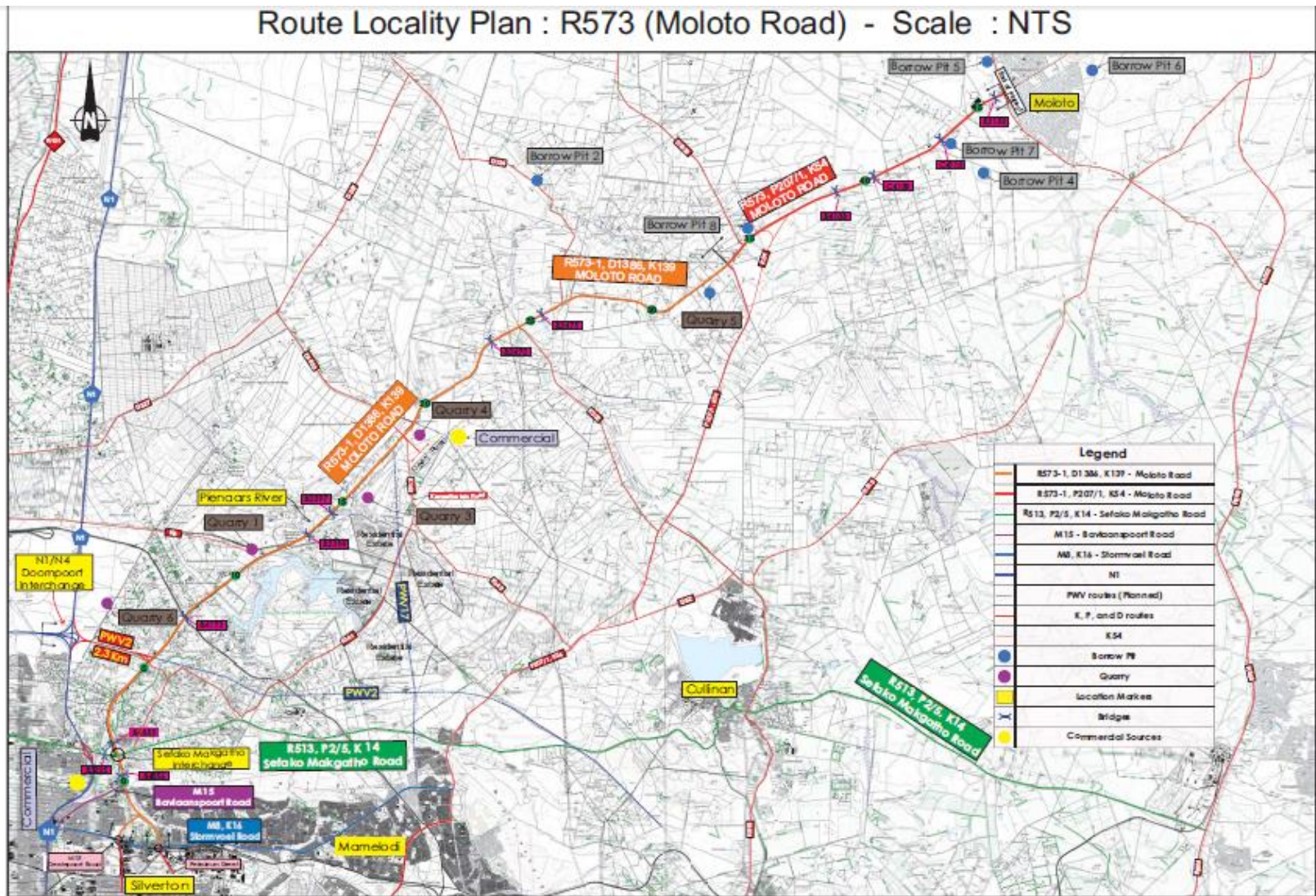


Figure 5: Quarry and Borrow pit sites identified

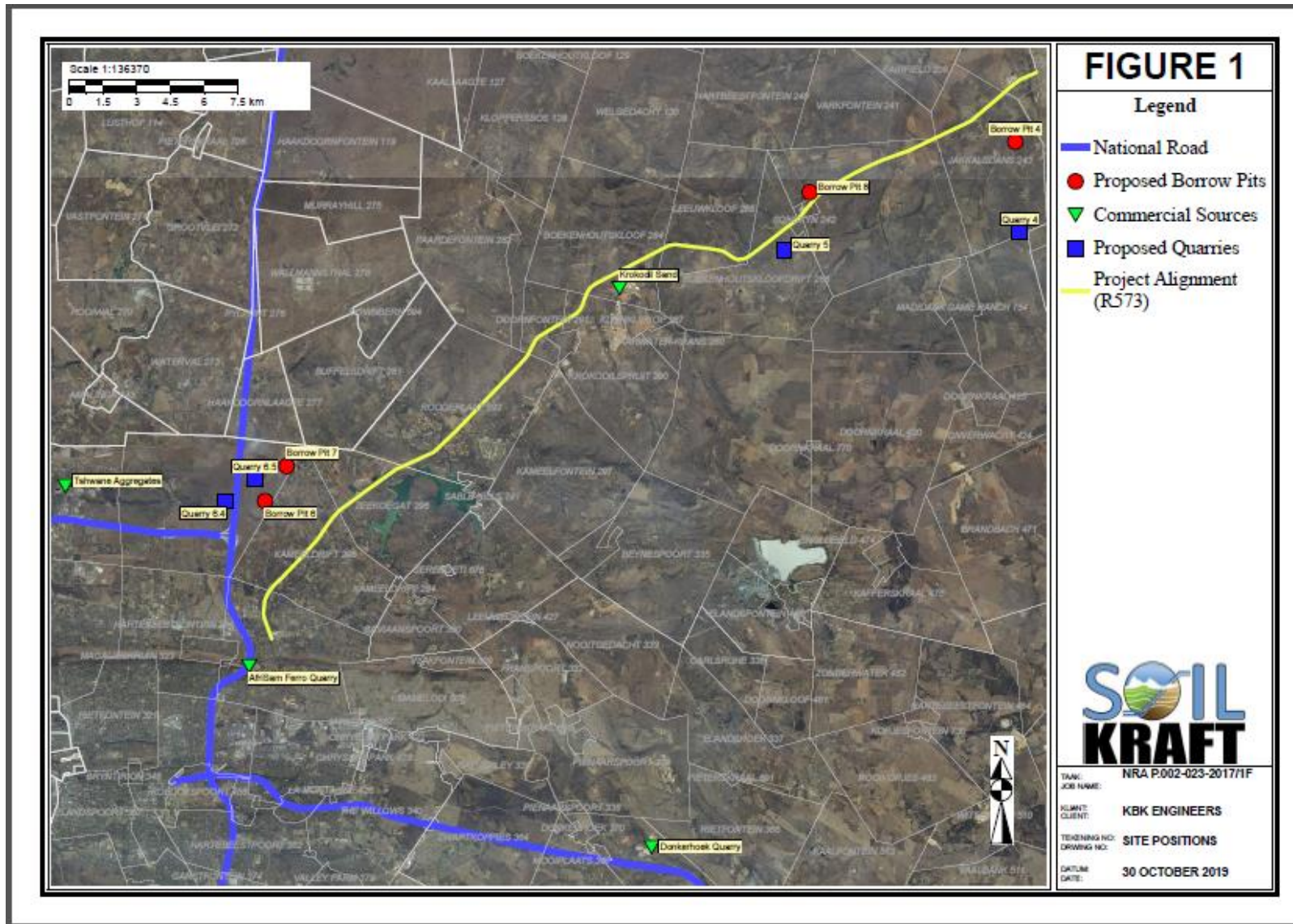


Figure 6: Quarry and Borrow Pit sites where material investigation was undertaken

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

The application for Environmental Authorisation is based on the need for material sources. The need for material sources defines the activity to be undertaken which is mining, therefore no activity alternatives were assessed during the EIA process.

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

Two layout alternatives have been assessed as part of this Environmental Impact Assessment. **Figure 7** shows Layout Alternative 1 and **Figure 8** Layout Alternative 2 (Preferred). An episodic drainage line is situated north of the proposed site. According to the Wetland Assessment undertaken by Limosella, a 16m calculated buffer has been imposed on the drainage line. As presented in **Figure 7**, Alternative layout 1, the stockpiles from the mining activities will be superimposed on the identified drainage line. In **Figure 8**, Layout Alternative 2 (preferred), the layout shows that the stockpiles size has been reduced in order to ensure that the 16m buffer has been accommodated to prevent siltation and disturbance to the drainage line.

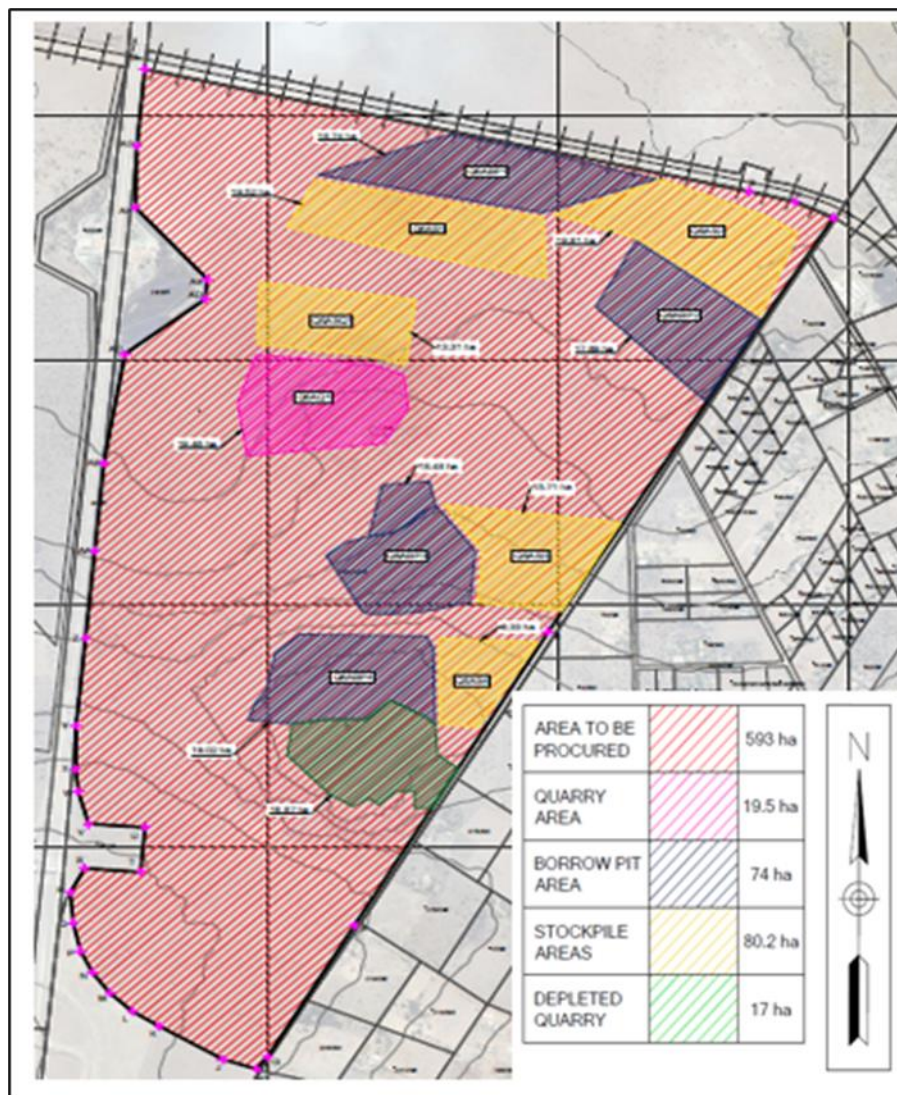


Figure 7: Layout Alternative 1 (KBK Engineers, 2021)

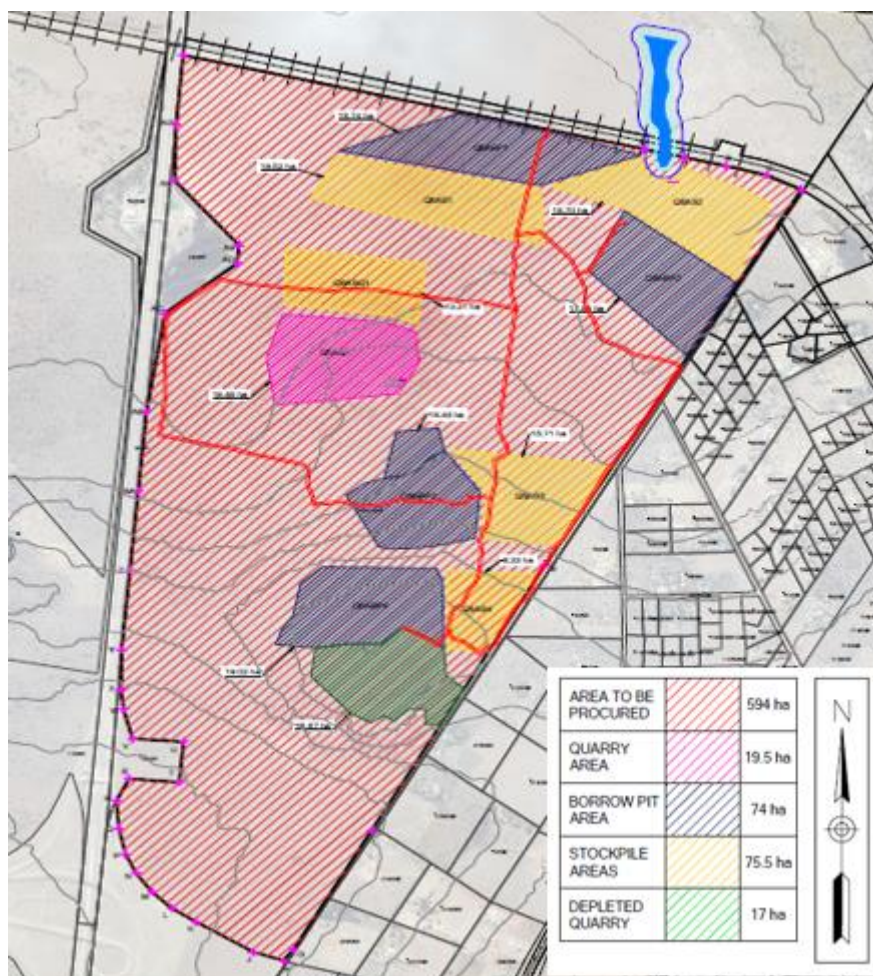


Figure 8: Layout Alternative 2 (Preferred) (KBK Engineers, 2021)

Based on the assessment of the two layout alternatives, Layout Alternative 2 is preferred as it would have a lesser impact on the drainage line.

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

No technology alternatives have been assessed.

(e) the operational aspects of the activity; and

Two options were considered for the operational aspects of the Quarry. These are as follows:

Option 1: Opencast mining using excavators and crushing and screening area on site.

Option 2: Opencast mining using excavators, transporting material for crushing and screening to an area offsite.

The advantage of Option 1 is that less time will be required for the processing of material and the operations of having all facilities on site is cost effective. The operations could potentially have a smaller carbon footprint due to reduced haulage of material resulting in less diesel use. The disadvantage is that there would be a potential increase in noise levels and an increase in dust disturbance.

The advantage of Option 2 is that less noise and dust will be generated on site. The disadvantage is that there are greater financial implications to have crushing and screening offsite as materials will have to be transported off site to be processed.

Based on the assessment of the two options, Option 2 will not be assessed further during the EIA phase of the project due to the substantial increased financial obligations for the transport of material to an offsite crusher.

- (f) the option of not implementing the activity.

The option of not implementing the activity is referred to as the No-Go alternative. The Potential Impacts as discussed in **Section v** would not materialise. The implications of implementing the no-go alternatives are as follows:

- The condition of the R573 will remain, safety and traffic concerns will prevail. The condition of the R573 will continue to deteriorate. The R573 links small towns and rural settlements with the City of Tshwane and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function. As such the poor condition of the road will have an effect on the economy.
- The direct economic benefits associated with the Quarry 6A operation for sourcing of material for the upgrade of the R573 Moloto Road would be lost. Furthermore, any possible indirect economic benefits of the quarry operation (related to the procurement of goods and services and the spending power of employees) would not materialise.
- Construction materials would have to be obtained from commercial sources, there would be other potential negative impacts associated with the movement of haul vehicles over large distances on the surrounding provincial and national road network (e.g. damage to roads from heavy loads, road safety and air pollution). Obtaining the required quality and quantity of material from commercial sources would not be financially viable. Substantial cost savings would result by eliminating the cost of transportation of large volumes of material from existing commercial sources.
- The No-Go alternative assumes that the project as proposed does not go ahead. This alternative would result in no environmental impacts on the natural environment or surrounding communities.

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 NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Scoping and EIA process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations. The purpose of the Public Participation Process is to provide all potential and / or registered Interested and Affected Parties (I&APs hereafter), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Scoping and EIA process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Scoping and EIA process. This Section of the report provides details on the Public Participation Process followed during the Scoping Phase for the proposed project. It must be noted that the initial public participation commenced in July 2018. The project was then placed on hold by the project applicant.

In addition to Chapter 6 of the NEMA EIA Regulations, 2014 as amended, on the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences. A Public Participation Plan was submitted to the DMRE on the 22nd of June 2020. Public Participation for the proposed project commenced on the 6th of July 2020. The Public Participation Plan is attached to **Appendix E**.

The Initial Public Participation process for both Quarry 6A & 6B was combined as both sites are located in close proximity to each other. Hence all comments received from stakeholders (for both Quarry 6A & 6B) have been captured in the scoping report.

a. Identification of Interested and Affected Parties

Interested and Affected Parties (I&APs) were identified through various means from the inception phase of the project. These means included the placement of an advertisement in a local newspaper the placement of Site Notices and the distribution of Notification Letters. Each of these are discussed below.

b. Notification Letters

Regulation 41(2)(b) of the NEMA (1998) EIA Regulations, 2014, as amended requires that written notification be given to various parties who include the following:

- (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- (iv) the municipality which has jurisdiction in the area;*
- (v) any organ of state having jurisdiction in respect of any aspect of the activity;*
- and*
- (vi) any other party as required by the competent authority;*

An example of the Notification Letter that was compiled for the proposed development is attached as **Appendix D1**. The document provided a background on the project, the proposed activities as well as information on how one can register as an Interested and Affected Party (I&AP) on the project in order to be able to be kept abreast of all developments. Notification letters were compiled and distributed to all adjacent landowners on the 27th of July 2018 and yet again on the 6th of July 2020. Knock and Drop Registers were completed for all I&APs that received a notification letter on the aforementioned dates. The knock and drop register is attached to **Appendix D9**. Electronic version of the notification letters were sent to I&APs until the end of the project.

c. Newspaper Advertisement

Regulation 41(2)(c) and (d) of the NEMA (1998) EIA Regulations, 2014, as amended requires that PPP includes the placement of a Newspaper Advertisement to notify all potential I&AP's about the proposed project and to invite them to register as I&APs and provide comments on the project. An advertisement was placed on page 2 of the Pretoria News on the 9th of July 2020 and on Page 4 of the Pretoria North Rekord on the 10th of July 2020. The proof of the placement of the Newspaper Advertisement is attached as **Appendix D2**.

d. Notice Boards/Site Notices

In accordance with the NEMA (1998) EIA Regulations, 2014, as amended, a notice board detailing the proposed activity as well as the contact details of the EAP was placed on site. Site notices presenting the project were erected on site and at visible and accessible locations close to the site on the 27th of July 2018. The locations of the placement of the notice boards are as follows and provided in **Appendix D3**.

- Lalapalm Road (25°38'34.99 S 28°17' 17.53"E)
- Corner of Ficus lane and Lalapalm Road (25°38'42.53"S 28°17'29.65"E)

- Maroela Road (25°38'17.90"S 28°17'43.66"E)
- Corner of Maroela Road and Lalapalm Road (25°38'44.04"S 28°17'34.11E)
- Maroela Road (25°39'21.46"S 28°17'25.10"E); and
- Corner of Karee street and Maroela Road (25°39'54.32"S 28°17'28.40"E)

Site notices were yet again placed on the 6th of July 2020 at the following locations:

- Lalapalm Road (25°38'34.99 S 28°17' 17.53"E)
- Corner of Ficus lane and Lalapalm Road (25°38'42.53"S 28°17'29.65"E)
- Super Spa Zambezi Retail Park (25°41'0.14"S 28°17'50.12"E)
- Kameeldrift police station (25°39'2.20"S 28°18'26.75"E)
- Kameeldrift weg shopping centre (25°39'36.90"S 28°18'41.83"E)
- Corner of Karee street and Maroela Road (25°39'54.32"S 28°17'28.40"E)
- Maroela Road (25°39'21.46"S 28°17'25.10"E);
- Raasblaar Street (25°37'10.29"S 28°18'11.06"E)
- Tambotiweg (25°37'27.38"S 28°17'50.00"E)
- Corner of Tambotiweg and Sekelbos Road (25°38'39.92"S 28°18'31.86"E)

e. Availability of Draft Scoping Report for review

The Public Participation process was undertaken in line with the directions issued by the Minister of Environment, Forestry and Fisheries on the 5th of June 2020, regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences.

The DSR was issued out for public review for a legislated period of at least 30 days from the 20th of November 2020 until the 18th of January 2021. The Draft Scoping report was made available at the Roodeplaat Library for the 30-day review period. The DSR was been made available for public review and registered I&APs were notified via email. The provision of the DSR for review allowed I&APs adequate time to review the details of the project and provide, in writing, comments and concerns relating to the proposed development. All registered I&APs were informed of the availability of the report through various means and proof of the notification has been included in **Appendix D7 and D8**. The following commenting authorities were provided with a copy of the report:

- Gauteng Department of Agriculture and Rural Development.
- City of Tshwane: Roads and Transport Department.
- Provincial Heritage Resource Agency Gauteng (PHRA-G).
- City of Tshwane: Environmental Planning and Open Space.
- South African Heritage Resources Agency.
- Department of Water and Sanitation.
- Gauteng Department of Roads and Transport.

E-mail notifications and telephone calls were utilised to notify all registered I&AP's about the availability of the report.

All comment received during the availability of the Draft Scoping Report is attached to **Appendix D7 and D8**.

f. I&APs Register and Comments & response report

From the onset of the project, a database of persons, organizations and organs of state identified as I&APs or registered as I&APs was opened and is updated as and when required. The I&APs register is included in **Appendix D4**. Comments received from various I&APs have been captured in the

Comments and Response Report. The Comments and Response report is attached as **Appendix D5**.

g. Focus Group Meetings/Public Open Day

No public open days have been held to date with I&APs. However, a focus group meeting was held with the ward councillors of Ward 96 and Ward 87 of the CoT. The minutes of the meeting are attached as **Appendix D6**. A Focus Group meeting was held with the City of Tshwane: Environmental Planning and Open Space department on the 14th of December 2020. The minutes of the meeting are attached as **Appendix D8**.

h. Final Scoping Report

The Final Scoping report was submitted to the DMRE on the 22nd of January 2021. The DMRE accepted the scoping report on the 24th of March 2021 and issued the project with reference number 30/5/1/1/2 (0002) BP. The proof of acceptance of the scoping report is provided in **Appendix E**.

I. Draft Environmental Impact Report

The Draft EIR was circulated for public review and comment for a period of 30 days. The Draft EIR was placed for public comment (in line with the Disaster Management Regulations) from the 28th of May 2021 until the 28th of June 2021, at the Roodeplaas library and on GA Environment's website.

The Draft EIR was also provided to the following Stakeholders:

- Gauteng Department of Agriculture and Rural Development.
- City of Tshwane: Roads and Transport Department.
- Provincial Heritage Resource Agency Gauteng (PHRA-G).
- City of Tshwane: Environmental Planning and Open Space.
- Gauteng Department of Roads and Transport.
- Department of Water and Sanitation.
- Department of Forestry Fisheries and Environment: Forestry Directorate.
- Department of Forestry Fisheries and Environment: Biodiversity Directorate.
- South African Heritage Resources Agency (SAHRA)
- Provincial Heritage Resources Agency Gauteng.
- Wonderboom Airport.
- South African Civil Aviation Authority.
- The local Ward Councillors; and
- All registered I&APs

Comments received during the review of the draft EIR has been incorporated in this Final EIR for review and consideration by the DMRE.

			<ol style="list-style-type: none"> 2. It is unclear as to whether other activities such as the burning of diesel will necessitate the requirement for an AEL. 3. It is not clear whether a major hazard installation licence will be required 4. A social impact report is required 5. Agreements between the project proponent and the land owner 6. Period of the proposed environmental authorisation 	
Lawful occupier/s of the land				
Not Applicable				
Landowners or lawful occupiers on adjacent properties				
Belinda Boshoff	X	27 th July 2018 & 28 th August 2020	Dust and heavy traffic on Maroela Road. Blasting will be a problem with animals on her property.	
Gonda van Ekeren	X	31 st July 2020	When will the upgrading of Moloto Road begin? Will be directly affected by the operations of the Quarry. Will Maroela and Lalapalm Road be tarred. Currently a lot of traffic on these roads, with dust during the winter months and mud during the summer months.	
Adri de Kock	X	31 July 2018	Condition of the existing roads and the current traffic experienced. School children make use of these roads, and with the haulage vehicles this will be a safety problem. Dust and blasting are a concern.	
Rainer Kreft	X	31 st July 2018	The Quarry is a safety and health risk for himself and adjacent landowners. According to the CoT website the road is for residential use and not primary metropolitan distributor.	
Jaap Rademeyer	X	14 August 2018	Requested information regarding the roads to be used to access the Quarry and haulage vehicles, the size of the Quarry, operating times, safety of school pupils, and the number of trucks per day that will be used for haulage.	
Christa Droste	X	3 August 2018	Concerns regarding dust and noise.	
Jurie Wessels/Marie Wessels	X	16 th August 2018 11 th January 2021	Concerns regarding the current condition of Maroela Road. Concerns regarding the current condition of Maroela Road and the increased traffic due the proposed operation of the Quarry.	
Steven Geldenhuys	X	10 th August 2020	Objected the proposed Quarry. Requested details regarding blasting and dust control measures. Increase toll fees on the on the N1 north from the Doornpoort plaza onwards so that more vehicles can make use of this	

		8 th January 2021	<p>national road, rather than spending billions on revamping the R573. The increased stream of cars on the N1 will make up for this deficit in toll fees, and then one could spend a fraction of the proposed budget to expand the on/off routes to Moloto and extended towns. Resides 200m from the proposed Quarry, blasting will have an effect on his infrastructure.</p> <p>Submitted an Appeal against the project. Indicated that there is minimal traffic on the R573 Moloto Road since the COVID 19 outbreak. The nation is suffering from the effects of COVID 19, as is the economy of South Africa and the world. The billions spent on the upgrade of the Moloto road could and should be better spent on more telling problems at the moment, such as putting food on the table of those who have lost their jobs, and continue to lose their jobs "thanks" to the COVID 19 crisis.</p>	
		18 June 2021	<p>Who will pay out the home owners in the area if their homes foundations are cracked and the house is deemed not safe to live in.</p> <p>Concerns regarding dust and noise pollution.</p> <p>Does the government deem it viable to spend millions, if not billions to upgrade a road whose traffic is a fraction of what it was.</p> <p>Why go through the process of listening to the public's comments, where we feel we have a right to object to what is going on around us, when the government does what it wants.</p>	
Mr Zak Labuschagne	X	18 August 2020 & 19 th August 2020	Requested which roads will be used for the haulage of vehicles, and the I&AP database. Number of people to be employed at the Quarry & where will the staff reside, blasting and the lifetime of the Quarry.	
Ms Sonja Scheepers	X	17 August 2020	<p>Strongly objects the proposed Quarry. Due to the following reasons:</p> <ul style="list-style-type: none"> • The environment will ultimately be destroyed. • Questioned the credibility of an EIA as all impacts translate as low. • Landowner consent has not yet been obtained but the EIA process still continues. • No consultation from the deeds office that a National Road is proposed adjacent to the property. • Traffic Pollution, health issues, climate and environmental damages, mist levels and noise that emanates from the R573. 	

		16 th January 2020	<p>Does not approve the proposed development as the development will affect the value of her property and the health of her, her family and the animals. Ms Scheepers is not willing to take responsibility for the damage which will be caused to her property irrespective to the pre-cautions that have been considered.</p> <p>It is unacceptable that she was not consulted by authorities and informed of the road servitude and that a national road will be built adjacent to her property.</p>	
Mr Tom Muller	X	26 August 2020	Concerns regarding the current state of Maroela Road and the potential groundwater impacts.	
Mr Sipiwe Moses Skosana	X	8 th January 2021	Requested information on the haulage route of the Quarry.	
Ms Rhona Brooks	X	12 th January 2021	The condition of the roads surrounding the site is off concern. The roads should be widened and tarred, road signs and also a traffic light to connect Maroela with the Moloto road. The internal roads are used by school children. Blasting shall not be allowed as the property is an agricultural holding.	
Cecile Swart	X	28 June 2021	Not in favour of the proposed Quarry. Concerns regarding dust, noise, traffic, employment seekers, and property value.	
TotalEnergies	X	29 th June 2021	<ol style="list-style-type: none"> 1. How will the CBA be protected; 2. Underground rock blasting- objected the use of blasting as a mechanism to break rocks from the ground. Alternative methods should be employed. 3. Dust Management 4. Underground water 5. Visual and aesthetic impacts 	
Municipal councillor				
Councillor Freddie Pienaar (Ward 87 City of Tshwane)	X	2 nd July 2020	Concerns about blasting and dust. Community upliftment and job creation is vital. How will this be addressed by SANRAL?	
Municipality				
City of Tshwane: Environmental Planning and open space	X	14 th December 2020	<p>A meeting was held with the City of Tshwane: Environmental Planning and open space. The CoT required additional information on the project.</p> <p>The minutes of the meeting is provided in Appendix D8. Comments were received from the CoT Environmental Planning and Open Space on the 27th of January 2021. A summary of the comments made is provided below:</p>	

		<p>22 June 2021</p>	<ul style="list-style-type: none"> • Confirmation regarding the absence or presence of Katdoring-loop traversing the southern section of the proposed development should be provided in the Draft EIA report • A layout plan should be revised to indicate the location of the watercourses in relation to the proposed development should be designed and included in the Draft EIA report. • Clarity regarding whether or not the proposed access roads will traverse the watercourse on the proposed development site should be provided in the Draft EIA report • Should the planned access road(s) traverse the watercourses on the proposed development site, the associated listed activity should be applied for and reflected in the Draft EIA report • Details about such mitigation measures aimed at reducing the potential noise and air pollution should be clearly articulated in the Draft EIA report • All identified specialist reports should be conducted and included in the Draft EIA report. • Clarity regarding use of railway infrastructure for the haulage of the material emanating from the proposed development site should be provided in the Draft EIA report • Proof of the lodgement of wayleave application with Transnet Freight Rail regarding proximity of blasting points to the TRF railway line should be included in the Draft EIA report. • Comments regarding potential aviation-related issues induced by the proposed development should be sourced from the Wonderboom Airport Management as well as the South African Civil Aviation Authority (SACAA) • A layout plan showing the proposed blasting points in relation to the railway infrastructure should be designed and included in the Draft EIA report. • Clarity regarding the potential impacts and associated mitigation measures regarding the blasting operations in close proximity to the national road N1 should be provided in the Draft EIA report. • The Blast Management Plan should be compiled and included in the Draft EIA report. <ol style="list-style-type: none"> 1. Comments regarding the need and desirability of fuel depot on the proposed development site should be provided in the Final Environmental Impact Assessment (EIA) report. 2. Details about the combined quantity of fuel to be stored on the proposed development site should be indicated in the Final EIA report. 	
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			<ol style="list-style-type: none"> 3. Clarity regarding the storage of fuel on the proposed development site when the proposed development site is abutting a fuel station should be provided in the Final EIA report. 4. Layout Alternative 2 which excludes watercourse from the proposed development should be implemented. 5. Implementation of a shade net along the eastern section facing the abutting residential dwelling to alleviate the dust impact should be investigated and comments included in the Final EIA report. 6. Comments regarding potential aviation-related issues induced by the proposed development should be sourced from the Wonderboom Airport Management as well as the South African Civil Aviation Authority (SACAA). 7. The Blast Management Plan should be compiled and included in the Draft EIA report. 8. A Rehabilitation Plan regarding the borrow pits will be provided during the decommissioning phase. 	
City of Tshwane: Roads and Transport Department Transportation Planning Division	X	14 th January 2021	The Draft Scoping Report was reviewed, the Department confirmed that they do not have any comments on the application, however they support the proposed development.	
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA.				
Department of Water and Sanitation	X	29 th March 2020	<p>The following comments were provided by the DWS subsequent to the site visit undertaken on the 24th of March 2021:</p> <ul style="list-style-type: none"> • The need and desirability for placing stockpiles within the watercourse is not known as there is sufficient space on site to accommodate the stockpiles without compromising the watercourse. Therefore, Instream Water Use (IWU) recommends the following: <ul style="list-style-type: none"> • Stockpiles must be moved outside of the watercourse and its scientifically determined buffer zone. • No infrastructure must be placed within the watercourse and its scientifically determined buffer zone. • The buffer zone must be scientifically determined to ensure protection of the watercourse. Should the wetland specialist be of the opinion that 30 m buffer is sufficient to protect the watercourse, a motivation must be submitted to support such opinion. 	

			<ul style="list-style-type: none"> The documentation submitted does not indicate any intention of rehabilitating the site. It must be indicated whether the site will be rehabilitated or not. If yes, a clear rehabilitation plan must be submitted. If no, the proposed activities will be considered as fatally flawed. The risk matrix must be updated as per above points Master layout plan must be updated to show the above changes, all infrastructures (inclusive of stormwater management infrastructure) in relation to delineated watercourses, 1:100 year floodlines and scientifically determined buffer zones. It must be brought to the attention of the applicant that the regulated area of a wetland refers to a 500 m radius from the boundary of any wetland or pan not 500 m from the boundary of the proposed activities / project site. Refer to GN 509 of 2016 for further information about definitions of the regulated areas 	
Transnet	X	19 th August 2020 3 rd December 2020	<p>What will the nearest distances be between the blasting points on site to the railway line, together with all drawings, aerial photos</p> <p>As this is only a notification and not an Application to do any work near the Transnet railway line, Transnet will not comment at this stage. Transnet will only comment once an application is submitted to them to do any work near the railway line.</p>	
City of Tshwane: Transport Department Infrastructure Design, Construction and Maintenance Division	X		No comments received to date	
Communities				
Dept. Land Affairs				
Department of Rural Development and Land Reform	X	25 th August 2020	Confirmed that there are land claims against the property. A 30-day notice shall be given to the department before the project commences.	
Traditional Leaders				
The Ward councillor confirmed that there were no traditional leaders within the ward. GA Environment has requested confirmation of such from COGTA.				
Dept. Environmental Affairs				
Gauteng Department of Agriculture and rural development	X		No comments received to date	
Department of Forestry, Fisheries and Environment-Biodiversity Directorate	X	29 June 2021	1. Provide Clarity to the Directorate: Biodiversity Conservation as to within which CBA does the development site falls, since	

			<p>developments are fatal flawed and not allowed on CBA 1 that is not transformed or disturbed</p> <ol style="list-style-type: none"> 2. Layout Alternative 2 must be recommended as the preferred layout alternative 3. A pre-construction walk-through of the final development footprint must be undertaken in order to locate and identify species of conservation concern that can be translocated 4. If several plant Species of Conservation Concern (SCC) which are protected are identified in the study area, a Search and Rescue Plan to exercise the removal and relocation of them must be developed and included as part of the final report 5. A detailed site Rehabilitation Plan must be developed and all disturbed and cleared areas be rehabilitated with indigenous perennial shrubs and grasses from the local area 6. An Alien Invasive Species Eradication Plan must be developed in order to reduce the establishment and spread of alien plant species within the development footprint. 7. Permits from relevant authorities must be obtained for the removal or disturbance of any TOPs, Red Data listed or provincially protected species 8. Sensitive habitats in close proximity to the development footprint must be avoided or demarcated as No-Go Areas i.e. drainage lines, wetlands, CBA's 	
Department of Forestry, Fisheries and Environment-Biodiversity Directorate	X	2 nd July 2021	<ol style="list-style-type: none"> 1. The Department advised that if any trees species protected by the NFA is encountered in the proposed area, such trees should be clearly marked and may not be destroyed without a licence in terms of the Act. 	
Other Competent Authorities affected				
South African Heritage Resources Agency	X	28 January 2021 02 June 2021	<p>A Phase 1 Archaeological Impact Assessment Report is required for the proposed Quarry.</p> <p>SAHRA Archaeology, Palaeontology and Meteorites Unit has no objections to this proposed development.</p>	
Provincial Heritage Resource Agency-Gauteng	X	14 th January 2021 04 th May 2021	<p>The Department confirmed that they will provide their comments on the Draft EIR on the Heritage Impact Assessment when available.</p> <p>A Heritage Impact Assessment shall be conducted.</p>	

Gauteng Department of Roads and Transport	X		No comments received to date	
OTHER AFFECTED PARTIES				
Wildlife and Environment Society of South Africa			No comments received to date	
INTERESTED PARTIES				

iv) **The Environmental attributes associated with the development footprint 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).

This Section serves to describe the environmental setting of the area identified and will also provide a description of the overall character and other sensitivities that were identified in the surrounding environment

Climate

Pretoria has a humid subtropical climate with long hot rainy summers and short mild winters (Wikipedia, 2020). An average high temperature of 29°C and an average low temperature of 18°C with January being the warmest month (Figure 9). June is the coldest month of the year with an average high temperature of 19°C and an average low temperature of 5°C.

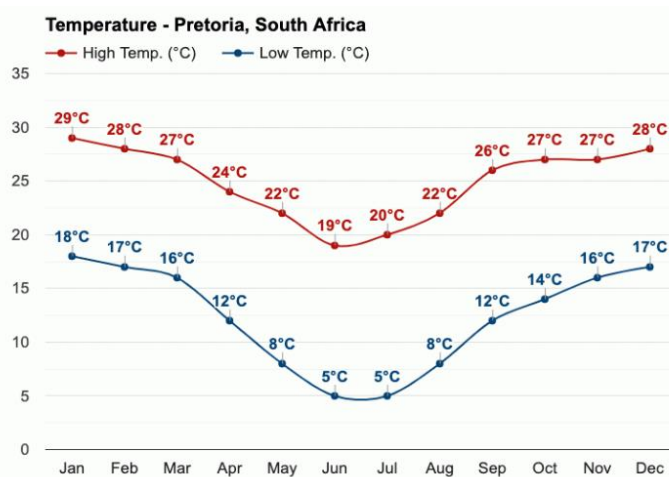


Figure 9: Average temperature for Pretoria (weather-atlas)

Pretoria experiences rainfall throughout the year, as there are approximately 88 rainfall days and 732mm is accumulated. The month with the most rainfall is January with an average of 154mm, and July has been recorded as the month with the least rainfall where 3mm has been recorded (Figure 10).

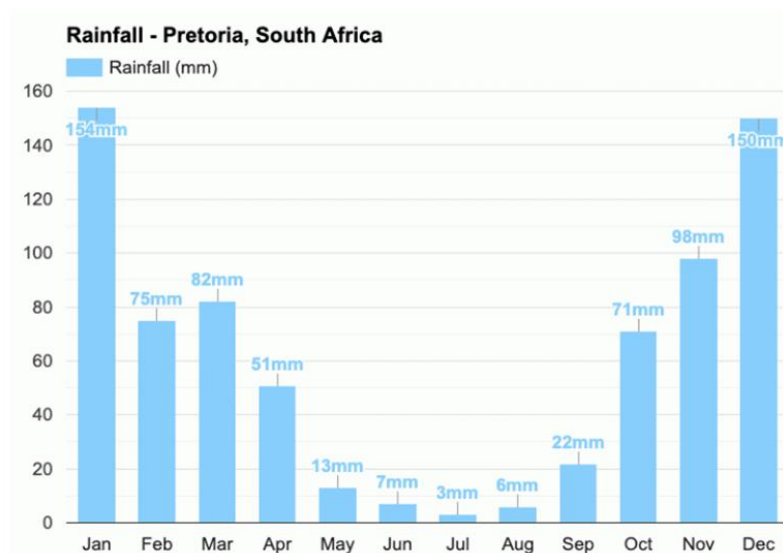


Figure 10: Average Rainfall for Pretoria (weather-atlas)

Topography

The project area is located at around 1 224 metres above mean sea level (m.a.m.s.l.) in the north, sloping slightly upwards in a southern direction to an elevation of around 1 237 m.a.m.s.l. in the south (**Figure 11**).



Figure 11: Google Earth elevation profile through the project area (shown in red) from north to south

From the Google Earth elevation profile illustrated, it can be seen that steeper slopes are located towards the centre of the project area, indicating a low ridge or extensive rocky outcrop in this location, while the northern and southern portions of the project area appear relatively level, with the exception of a prominent rocky outcrop in the vicinity of the existing depleted quarry in the southeast of the project area.

Geology

A Materials investigation was commissioned by KBK engineers as part of the engineering contract. According to the Materials Investigation undertaken by Soilkraft cc (2019), the farm Doornpoort 295 JR is largely underlain by the upper zone of the Rustenburg Layered Suite, Bushveld Igneous Complex. While syenite, diabase and harzburgite features (i.e. dykes) are indicated on the farm, the geology is dominated by the following:

Gabbro Unit (4 Ng1): The majority of the farm is underlain by this unit. Regional information indicates that bedrock materials include gabbro, hyperite and norite with localised pyroxenite and anorthosite.

Ferrogabbro Unit (4 Ng2): Northern parts of the farm host this Unit, which consists of bedrock materials including ferrogabbro and ferrodiorite which contain localised magnetite bands. Lesser constituents listed by regional information include troctolite, magenitite, anorthosite, quartz-gabbro, quartz-diorite and syenite rock. **Figure 12** presents the regional geology of the area. It is important to note that during the geological investigations the proposed site was termed Quarry 6.5 as shown on **Figure 12**.

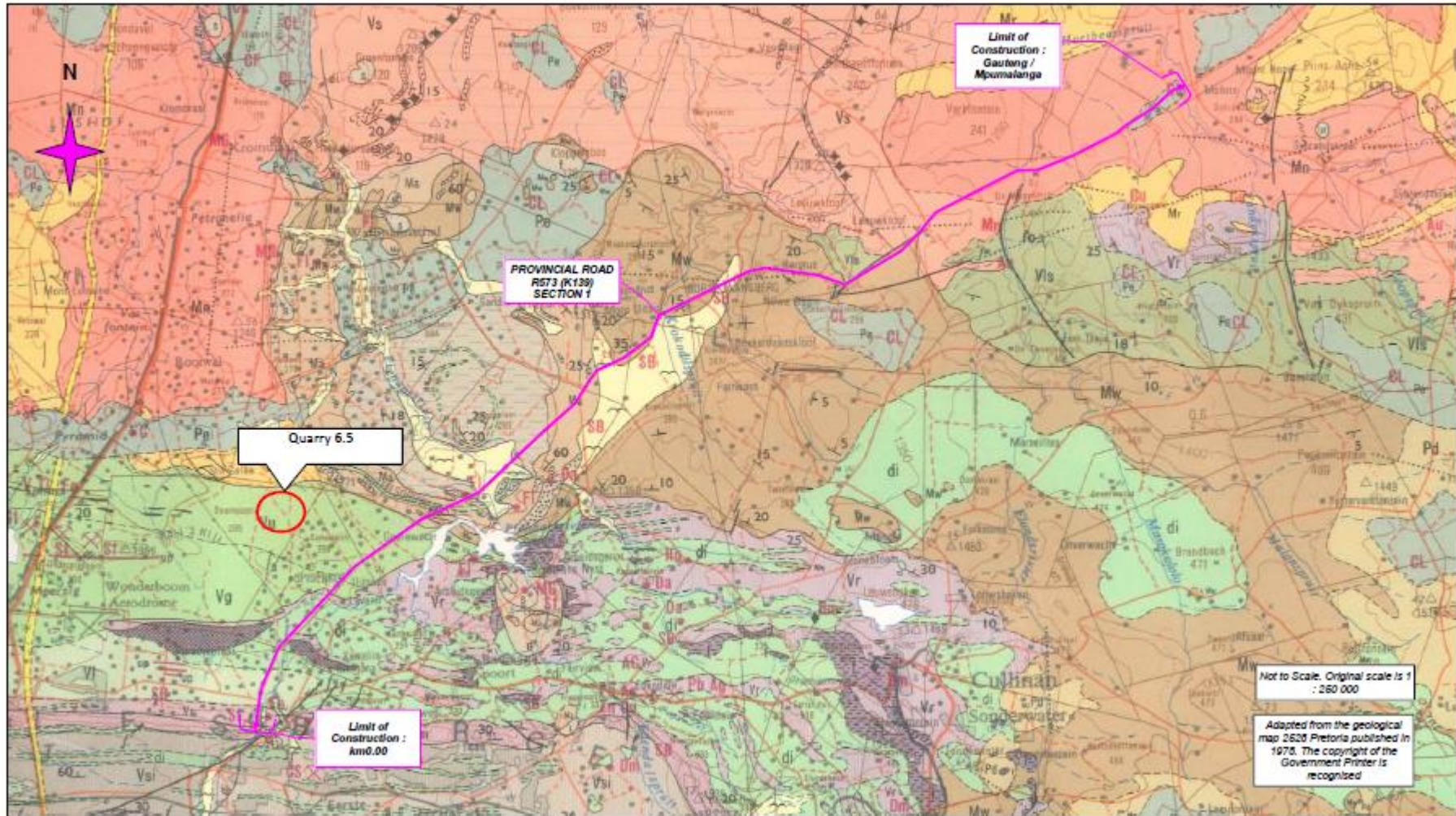


Figure 12: Regional Geology Quarry 6A (Soilkraft cc, 2019)

The Geotechnical Investigation has revealed that potential source of rock material that can be crushed to produce G1 aggregate and crushed G6 gravel by-products.

Regional Vegetation and Conservation Plan Area

This section describes the vegetation present, including each habitat unit associated with the study area.

Conservation Plan Area

The central portion of Quarry 6A is indicated to be associated with a Critical Biodiversity Area (CBA): Important Area (CBA2), due to the presence of primary vegetation and Red Listed bird habitat. This CBA extends westwards into the adjacent property and is likely an important habitat corridor (Field and Form, 2021). (Figure 13).

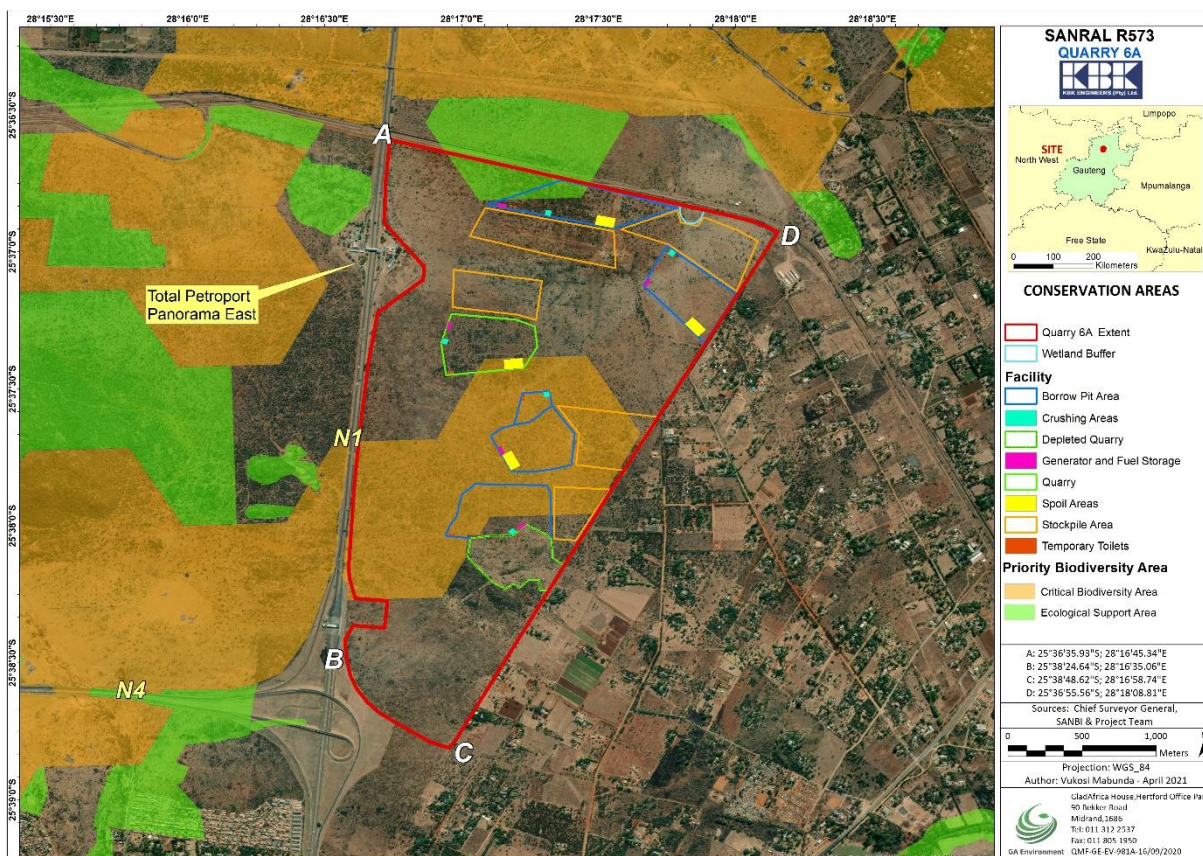


Figure 13: Gauteng C-Plan of the Study Area

A portion of the project area along its northern boundary is indicated to fall within an Ecological Support Area (ESA).

Vegetation types and Habitat Units

The central portion of Quarry 6A is located with the remaining extent of Marikana Thornveld (EN) and Norite Koppies Bushveld (LC) (Figure 14). The threat status of these vegetation types are Least Concern and Endangered, respectively. Both the Norite Koppies Bushveld and Marikana Thornveld are Poorly Protected ecosystems.

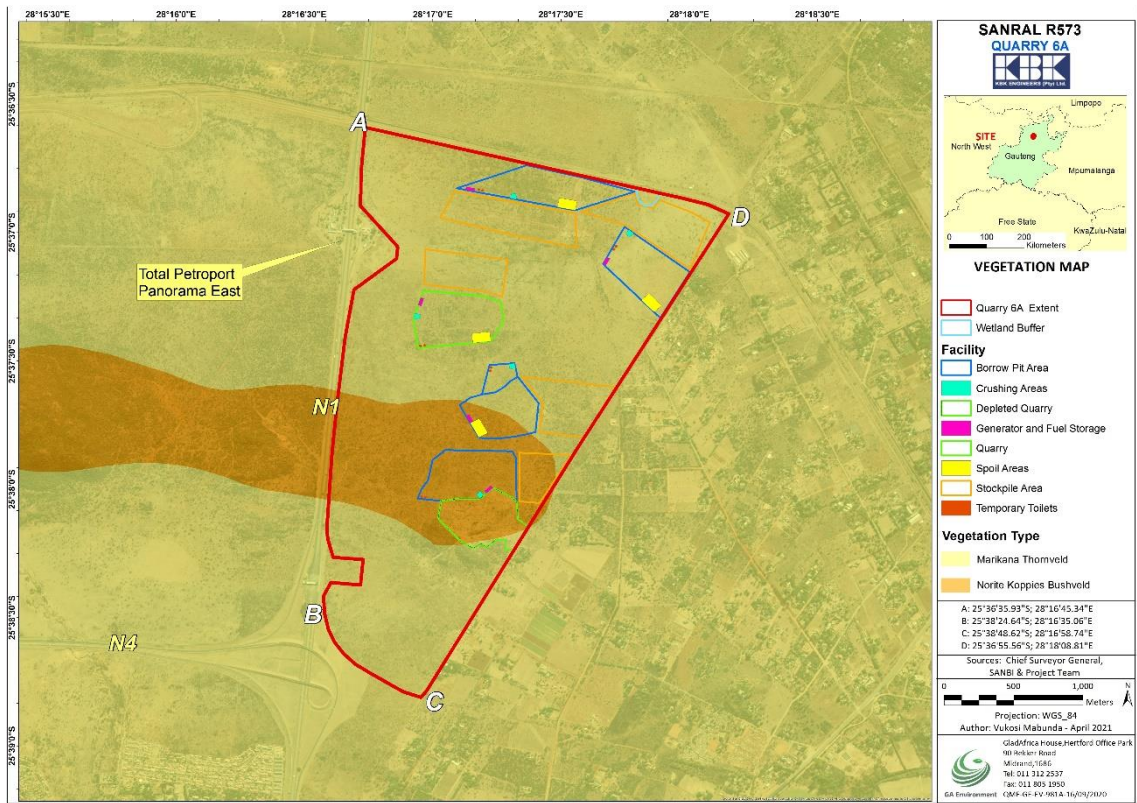


Figure 14: Vegetation in relation to the project Area

The Terrestrial Biodiversity Assessment undertaken by Field and Form Landscape science revealed that the proposed study area is characterised by four habitat units (Figure 15). These habitat units based primarily on floral species composition and vegetation structure, faunal species' habitat provision, the topographical position of the habitat unit in the landscape, as well as the degree of anthropogenic impact and disturbance within the unit.

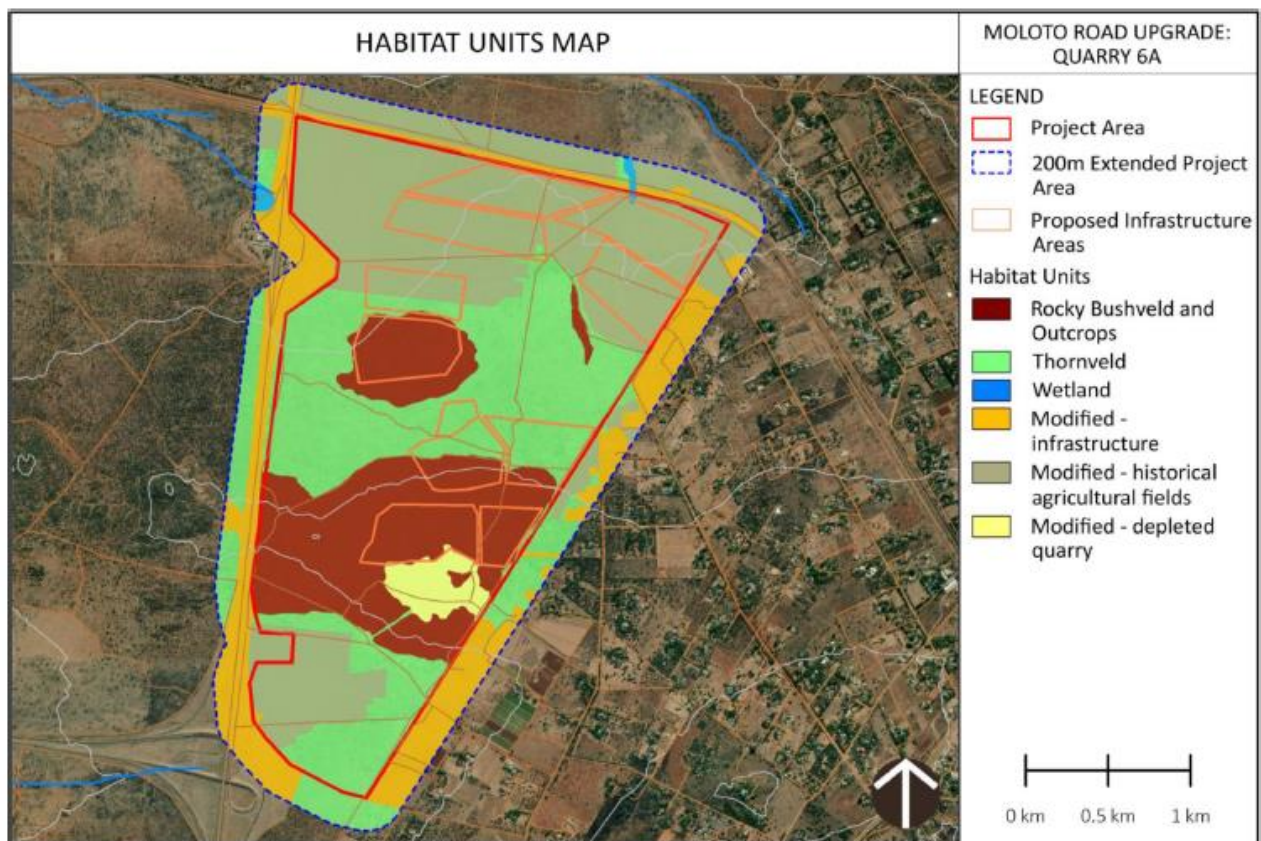


Figure 15: Habitat Units Identified

Table 6 provides a description of each of the habitat units and the sensitivity. The terrestrial biodiversity sensitivity analysis has been compiled by assessing the current ecological condition of each identified habitat unit and its associated biodiversity value. This includes the interaction between each habitat unit's ecological sensitivity to the proposed development and the ecological structure of these habitats. The terrestrial ecological sensitivity map is provided in **Figure 22**.

Table 6: Habitat Units Identified within the Study Area (Field and Form:2020)

Habitat Unit	Sensitivity Class	Description
Rocky Bushveld and Outcrops	High	The central portion of the project area comprises rocky bushveld and rocky slope habitat, mainly associated with the Norite Koppies Bushveld vegetation type, while a prominent rocky outcrop borders the existing depleted quarry within the southeast of project area (Figure 16 & Figure 17). The Rocky Bushveld and Outcrop habitat form important faunal micro-habitats and a likely hotspot for increased diversity through the provision of unique niche habitats, unique floral associations and microclimates. These habitats provide foraging and refuge opportunities as well as act as important ecological features. As such, these habitats provide elevated niche heterogeneity and subsequent higher species richness than adjacent habitats. This habitat is in a good ecological condition, with an intact vegetation structure and a high woody and herbaceous species diversity present. This habitat unit provides niche habitat for certain floral species, and suitable habitat for floral SCC to occur. The habitat unit is located within both CBA: important area, and areas of highest biodiversity importance in terms of the Mining and Biodiversity Guidelines (2012). This habitat unit has a terrestrial ecological sensitivity as high.
Open Thornveld	Medium	The majority of the project area, excluding historically modified areas and the low ridges and rocky outcrops located towards the central portion of the project area, comprises moderate to good condition bushveld vegetation largely representative of the Marikana Thornveld vegetation type (Figure 18). The woody layer is dominated by thornveld species such as <i>Vachellia</i> (<i>Acacia</i>) <i>karroo</i> , <i>V. nilotica</i> subsp. <i>kraussiana</i> , <i>V. tortilis</i> subsp. <i>heteracantha</i> , <i>Senegalia caffra</i> and <i>Dichrostachys cinerea</i> subsp. <i>africana</i> . The vegetation structure and species composition within this habitat unit is largely intact and an overall high floral species diversity is present. Some localised disturbances including grazing impacts and alien invasive species encroachment have been observed, with common alien species including <i>Zinnia peruviana</i> , <i>Tagetes minuta</i> , <i>Gomphrena celosioides</i> and <i>Shkuhria pinnata</i> and prominent listed alien invasive species noted including <i>Cereus jamacaru</i> , <i>Lantana camara</i> and <i>Opuntia ficus-indica</i> . This habitat unit has a terrestrial ecological sensitivity as medium.
Wetland	High	A drainage line of limited extent occurs within the northeast of the project area (Figure 19). This drainage line extends further northwards to eventually drain into the Pienaars River approximately 7km to the northeast of the project area. A seepage wetland is located within the 200m extended project area to the northeast. Overall, the vegetation composition of the Wetland habitat unit is similar to that of the surrounding Marikana Thornveld habitat unit and associated turf soils. This habitat unit has a terrestrial ecological sensitivity as high.
Modified Thornveld (historical agricultural areas)	Medium Low	This habitat unit has been significantly impacted through agricultural activities over an extended period of time, however secondary vegetation has partially established, although the overall species diversity is lower than that of the surroundings. An ESA is indicated to coincide with this habitat unit (Figure 20).
Modified Thornveld (infrastructure areas and depleted quarry)	Low	This habitat unit has been significantly impacted through infrastructural developments and historical quarrying activities over an extended period of time. This habitat unit is of low ecological sensitivity (Figure 21).



Figure 16: Representative photographs of the Rocky Bushveld Habitat unit



Figure 17: Representative photo's of the rocky outcrop habitat



Figure 18: Representative photo's of the open thornveld habitat unit



Figure 19: Representative photographs of the Wetland habitat unit within the northeast (top) and to the northwest of the project area (bottom)



Figure 20: Representative photographs of the Modified Thornveld habitat unit associated with the historical agricultural fields



Figure 21: Representative photographs of the Modified Thornveld habitat unit associated with the disused quarry

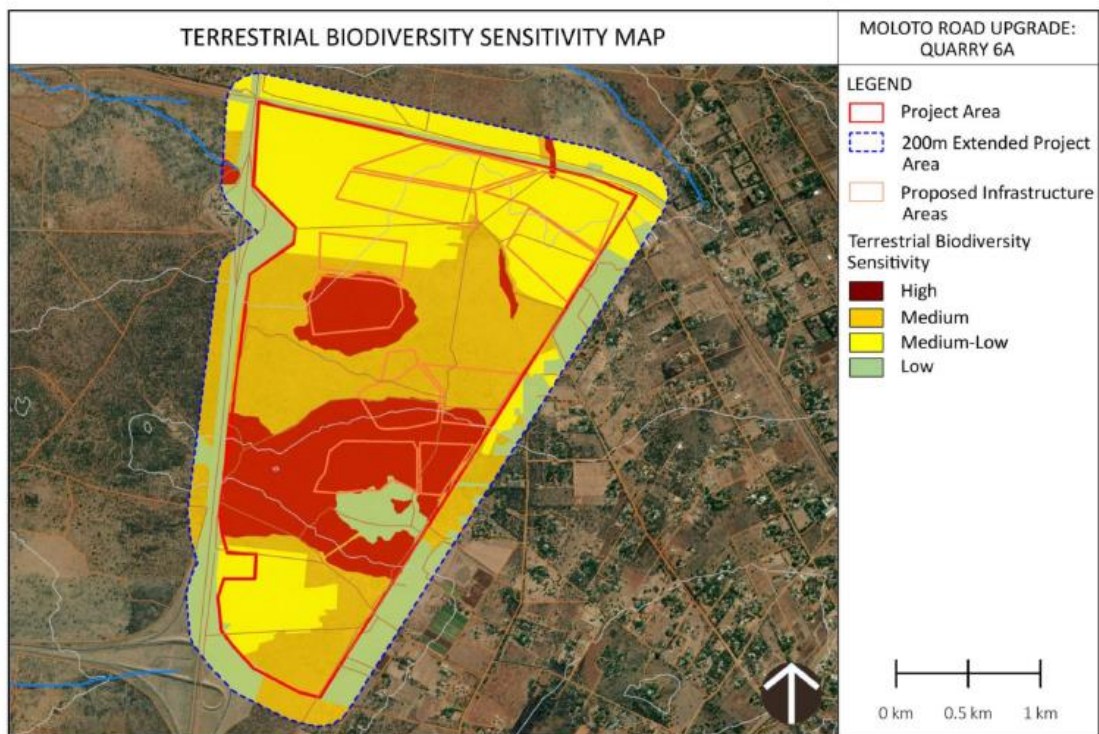


Figure 22: Terrestrial Ecological Sensitivity Map for Quarry 6A

Figure 23 is an indication of the sensitivities in accordance with the Mining and Biodiversity Guidelines. In terms of the Mining and Biodiversity Guidelines (2012), the central portion of the project area is located within an area of Highest Biodiversity Importance, with several smaller portions in the north and south of the project falling within areas of High

Biodiversity Importance. It must be understood based on this Figure that mining activities provides a very high risk due to the potential biodiversity significance and important.

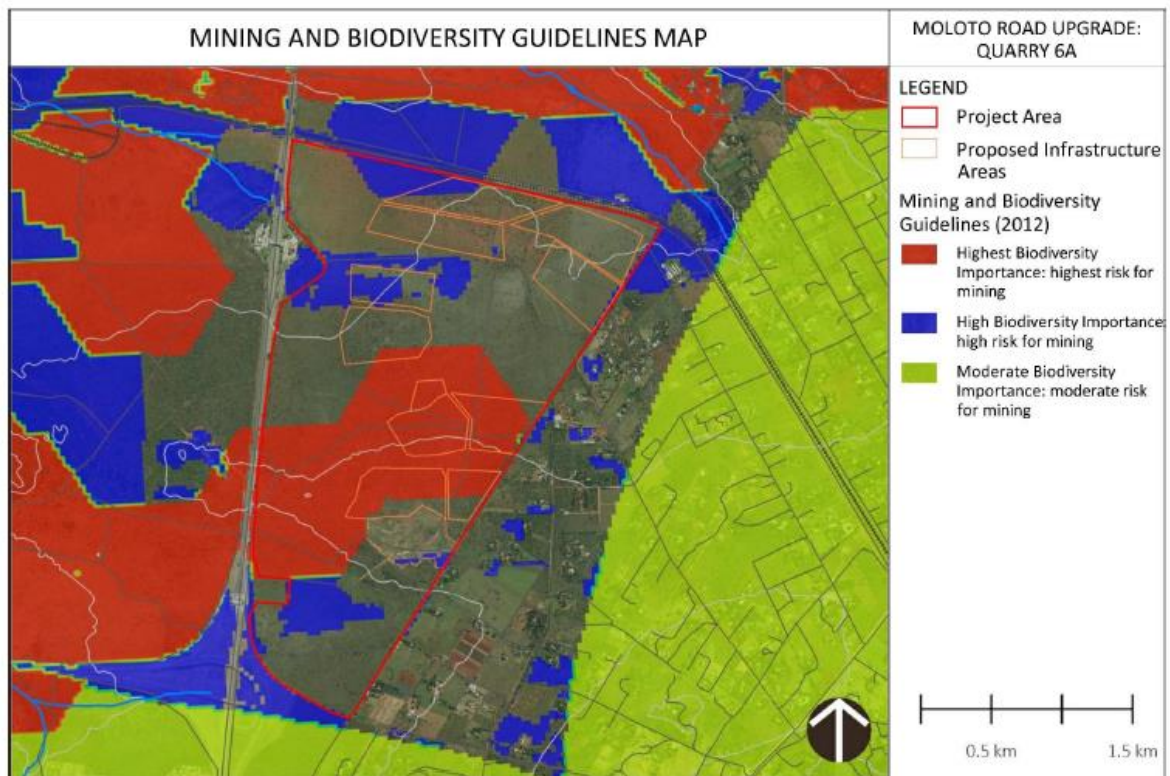


Figure 23: The location of the project area in relation to areas of increased biodiversity importance in terms of the Mining and Biodiversity Guidelines (2012)

Faunal Habitat and Species

Habitat transformation and fragmentation coupled with increased human presence and associated impacts (persecution, hunting, trapping and intensification of land management) have had a negative impact on faunal species composition.

According to the Terrestrial Biodiversity Assessment, Species of Conservation Concern were not encountered during the field assessment, however there is a probability of occurrence of certain SCC species. Seven mammals were identified within the project area based on direct observations and indirect signs, these include, *Sylvicapra grimmia*, *Raphicerus campestris*, *Tragelaphus strepsiceros*, *Canis mesomelas*, *Hystrix africae australis*, *Phacochoerus africanus*, and *Lepus saxatilis*. The rocky bushveld and outcrop habitat (surrounding by thornveld habitat) acts as an important refugia for smaller mammals and increase niche diversity within the project area. Small to medium sized mammals likely to be present within the study area include Namaqua Rock Mouse (*Micaelamys namaquensis*), Tete Veld Rat (*Aethomys ineptus*), Xeric Four-striped Mouse (*Rhabdomys pumilio*), Single-striped Grass Mouse (*Lemniscomys rosalia*), Bushveld Gerbil (*Gerbilliscus leucogaster*), Fat Mouse (*Steatomys pratensis*), Eastern Rock Sengi (*Elephantulus myurus*) and *Mastomys* sp. Southern Lesser Galago (*Galago moholi*) are known to utilise thornveld as well as within the urban landscape of Pretoria. The project area is surrounded by a fence which will limit the movement of larger mammals. No Herpetofauna, Amphibians and reptiles Species of Conservation Concern were noted in the study area.

In terms of avifauna, species recorded are largely associated with bushveld habitats (dominant within the project area and surrounds) and commonly noted species include Dark-capped Bulbul (*Pycnonotus tricolor*), Blue Waxbill (*Uraeginthus angolensis*), Tawny-flanked Prinia (*Prinia subflava*), Karoo Thrush (*Turdus smithi*), Grey Go-Away Bird (*Corythaixoides concolor*) and Red-eyed Dove (*Streptopelia semitorquata*). The interface between the thornveld and the rock outcrop reflected a slight change in species composition with several species such as Cape Robin-chat (*Cossypha caffra*) and Amethyst Sunbird (*Chalcomitra amethystine*) were only reported from this habitat. The largely limited avian habitat diversity within the project area explains the lack of other guilds such as waders, riparian and grassland species which will utilise suitable habitats outside of the project area.

Gauteng Environmental Management Framework

The Gauteng Department of Agriculture and Rural Development have developed an Environmental Management Framework Tool to streamline the requirements for an Environmental Impact Assessment (EIA). In addition to reduce the need for the undertaking of EIA requirements and a reduction in timeframes for approvals and as a contribution towards reducing the cost of doing business in Gauteng. In this tool, a number of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) listed activities are excluded from the requirement to obtain an Environmental Authorisation (EA). Government Notice 164 in Government Gazette No. 41473 of 2 March 2018 presents a list of activities that are excluded from the need to obtain an Environmental Authorisation as they occur within Zones 1 and 5 of the Gauteng Provincial Environmental Management Framework (GPEMF). **Table 7** indicates the various zones of the GPEMF including *Zones 1 and 5*.

Table 7: Gauteng Environmental Management Framework Zones

ZONE	INTENTION
Zone 1: Urban development zone	The intention with this zone is to streamline urban development activities in it and to promote development infill, densification and concentration of urban development, in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas. The study area falls with this zone.
Zone 2: High control zone (within the urban development zone)	This zone is sensitive to development activities. Only conservation should be allowed in this zone. Related tourism and recreation activities must be accommodated in areas surrounding this zone
Zone 3: High control zone (outside the urban development zone)	This zone is sensitive to development activities and in several cases also have specific values that need to be protected. Conservation and related tourism and recreation activities should dominate development in this zone.
Zone 4: Normal control zone	Intention This zone is dominated by agricultural uses outside the urban development zone. Agricultural and rural development that support agriculture should be promoted
Zone 5: Industrial and large commercial focus zone Intention	The intention with Zone 5 is to streamline non-polluting industrial and large-scale commercial (warehouses etc.) activities in areas that are already used for such purposes and areas that are severely degraded but in proximity to required infrastructure. The study area also falls with this zone.

According to **Figure 24**, majority of the site falls within Zone 1 (urban development zone), and the area situated with the centre of the site falls within Zone 2 (High Control Zone). The intention of Zone 2 is provided in **Table 7**. The proposed site is not considered for exclusion as the site is characterised by two zones as per the EMF.

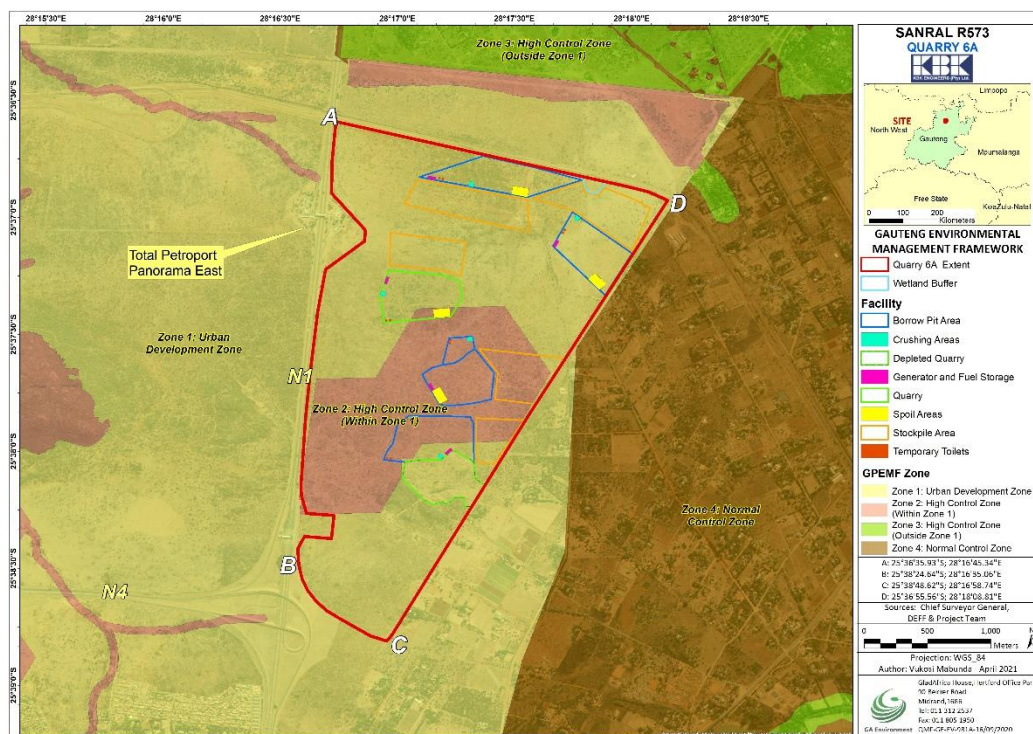


Figure 24: Quarry 6A EMF Map

Agricultural Potential

Agricultural Potential Areas are based on four main pillars which are Agricultural Hubs, Important Agricultural Sites, Existing Agriculture and Remaining high Potential Agricultural Land. According to the Gauteng Agricultural Potential Atlas IV (GAPA IV) and as presented in **Figure 25**, fragmented portions of the site fall within High Potential Agricultural Land (HPAL) area.

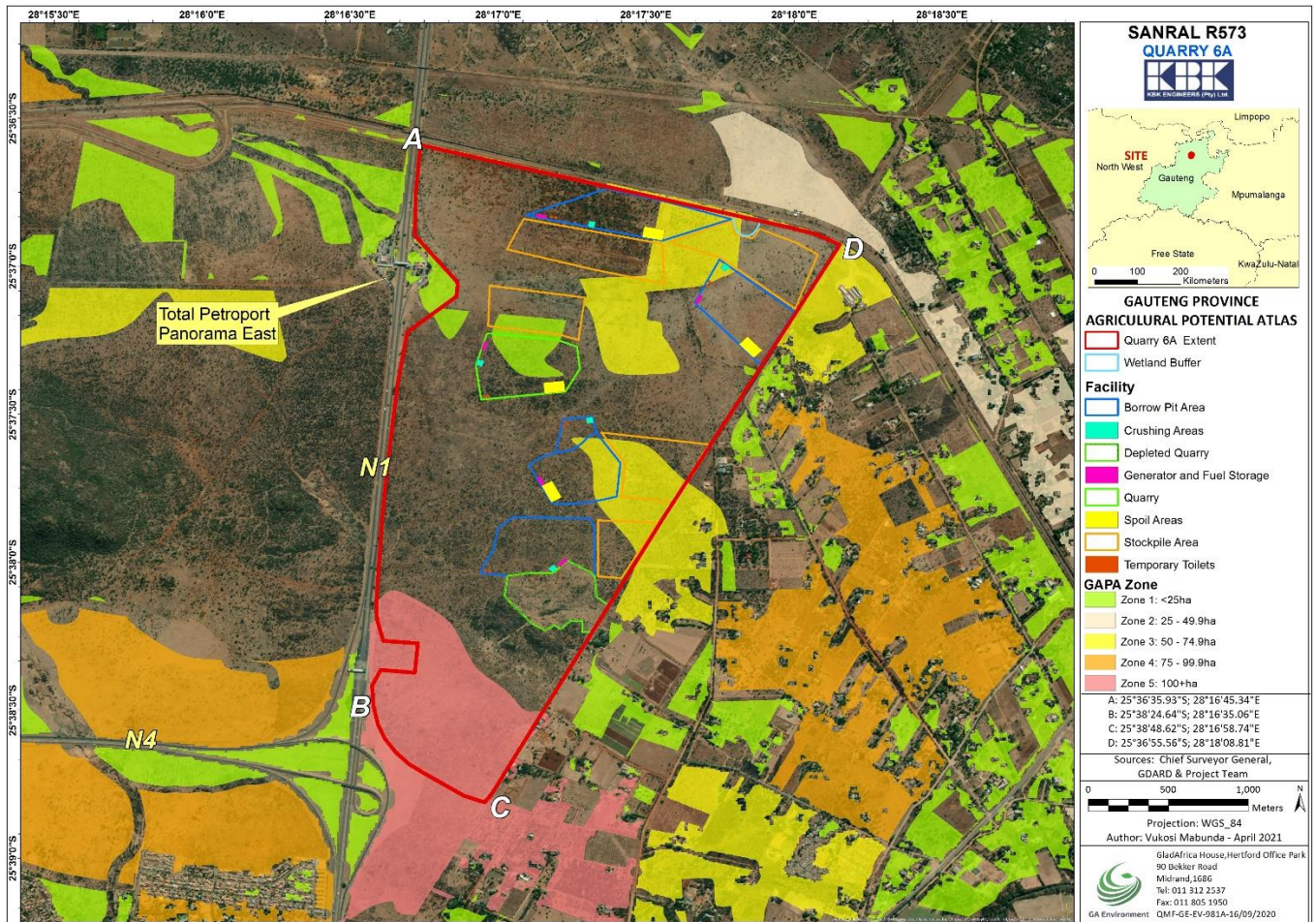


Figure 25: Quarry 6A Agricultural Potential Map

Historical aerial photograph, dated 1980, which indicates agricultural practices within the north and southwest of the site and the use of the quarry as shown in **Figure 26**. Currently no crops are being grown within the study area, however cattle farming is evident.



Figure 26: Historical aerial photograph dated 1980, showing areas utilised for agricultural purposes and quarrying activities during this time (Field and Form Landscape Science, 2021)

Wetland and Aquatic Assessment

A Wetland Assessment was undertaken by Limosella consulting. The proposed study area falls within the Quaternary Catchments A23B and A23E, which forms part of the Limpopo Water Management Area. The study revealed one small watercourse which was recorded in the north of the study site as presented in **Figure 27**. According to the historical imagery, this watercourse has been impacted by anthropogenic activities such as the railway and road crossing and as a result only a small section remains on the study site with several changes in the hydrology. This watercourse is classified as an episodic drainage area and is therefore unlikely to exhibit wetness condition all year long.

The north eastern section of the study area also falls within 500m of a seepage wetland. A 16m buffer has been recommended by the specialist. The mining activities proposed for the site has been adjusted to ensure that mining activities is undertaken out of the 16m buffer (**Figure 27**). A buffer zone is defined as a strip of land surrounding a wetland or riparian area in which activities are controlled or restricted.

Since mining activities will be undertaken within the DWS regulated area a Water Use Authorisation has been logged with the DWS. The process is currently on-going and a site visit was undertaken with the department on the 24th of March 2021. The minutes of the meeting/site visit is provided in **Appendix D8**.

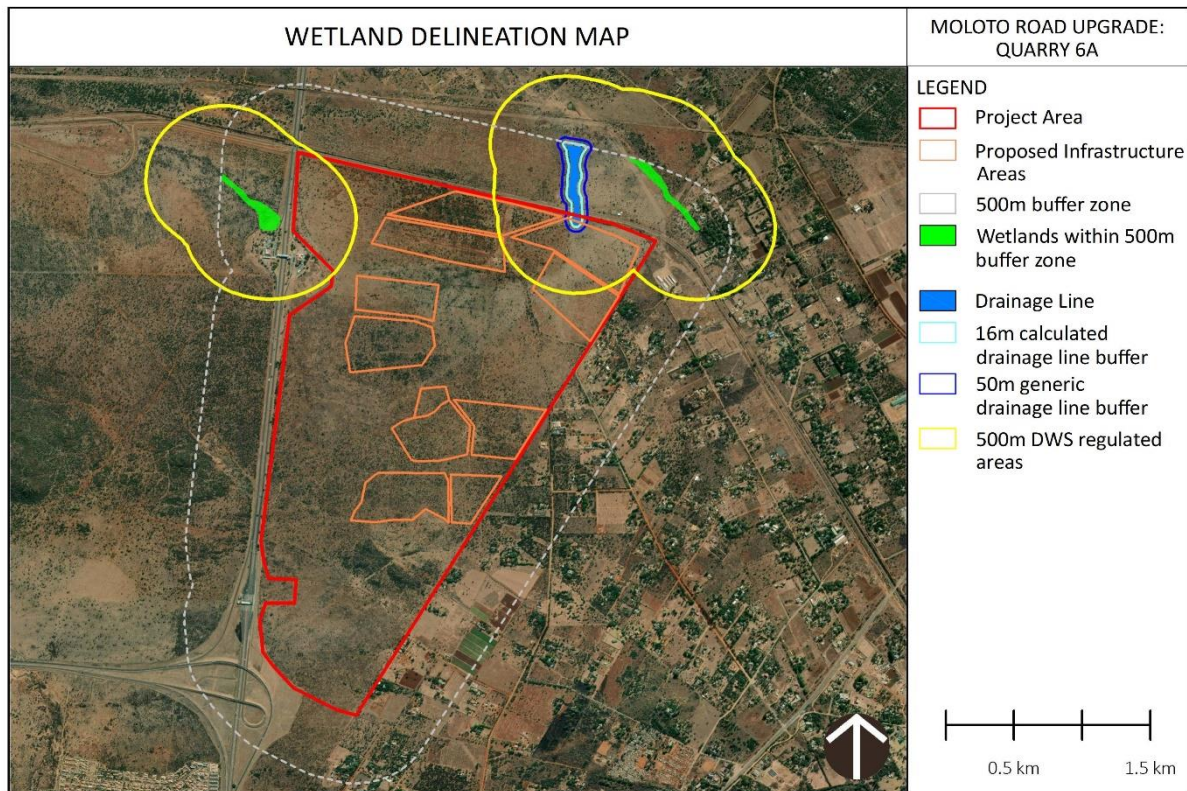


Figure 27: Watercourses and the DWS Regulated Area

An Aquatic Assessment was undertaken by Limnology for the various R573 Moloto Road Upgrade projects, including Quarry 6A. According to Limnology, Quarry 6A is not located near aquatic ecosystems suitable for the SASS 5 protocol. There are wetlands present, but these are nonperennial. SASS 5 monitoring could not be undertaken for the sake of sampling as such sampling will not provide adequate impact prediction and monitoring.

Potential impacts on the watercourse have been assessed as part of this EIR. A Wetland Rehabilitation Plan has been compiled by Limosella and is attached to **Appendix G**.

Heritage and Palaeontological Features

The Palaeontological sensitivity map as provided on the South African Heritage Resources Information System (SAHRIS) was consulted to verify the Palaeontological sensitivity of the proposed study area (**Table 8 and Figure 28**). In terms of the Palaeontological Sensitivity Map, the site sensitivity is insignificant/zero and no palaeontological studies are required.

Table 8: Palaeontological Sensitivity Index

Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.



Figure 28: Palaeontological Sensitivity Map (SAHRIS)

A Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk. The report is attached to **Appendix F**. According to the information taken from this report, the cultural landscape qualities of the region essentially consist of a rural setup. The human occupation in the study area is made up of a pre-colonial element consisting of limited Stone Age occupation and an extensive Late Iron Age occupation, as well as a much later colonial farmer component, which eventually gave rise to large-scale urban development. The study revealed that no sites, features or objects of cultural historic significance have been identified within the study area.

Socio-Economic

The proposed study area is situated within the City of Tshwane Metropolitan Municipality. The Metropolitan covers an area of 6360km² with a population of 3 275 152. The study area is situated with ward 87 of the Municipality. Ward 87 covers an area of 50.2km² with a population of 29 931.

According to the 2011 census, the population of Ward 87 was 29 931. Of these 7% were coloured, 42% black and 49% white as depicted in **Figure 29**. Of the total population 69% were between the ages of 18 and 64 with 50% of the population consisting of males (Census, 2011).

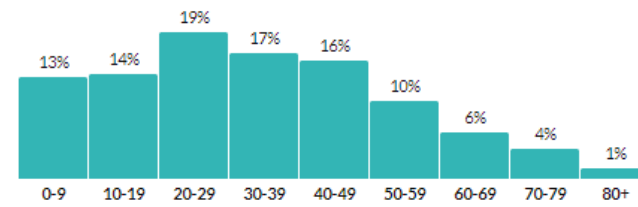
Age

32

Median age

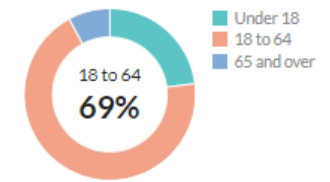
about 10 percent higher than the figure in Gauteng: 28
 about 1.3 times the figure in South Africa: 25

Population by age range



Source: Census 2011

Population by age category



Source: Census 2011

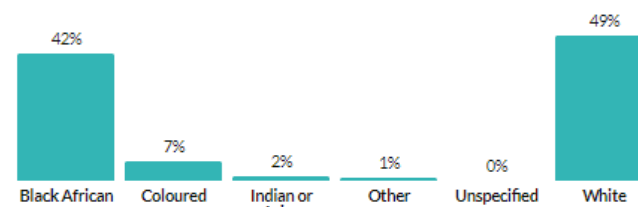
Population

29 931

People

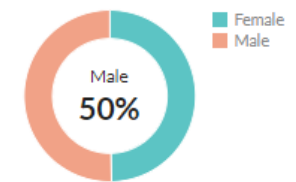
Gauteng: 12,272,263L
 South Africa: 51,770,560L

Population group



Source: Census 2011

Sex



Source: Census 2011

Figure 29: Ward 87 Demographics (<https://wazimap.co.za/profiles/ward-87>)

a) Employment

In 2011, 60.3% of the community members within Ward 87 were employed with 77% of these employed in the formal sector. The average annual income is R 117 000 which is double of the average annual income of Gauteng which is R 57 500 as presented in **Figure 30** below.

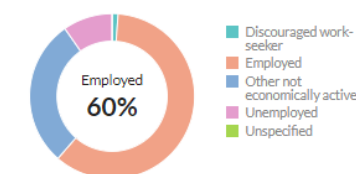
Employment

60.3%

Employed

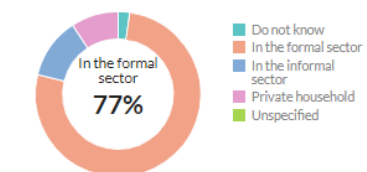
about 20 percent higher than the rate in Gauteng: 50.59%
 about 1.5 times the rate in South Africa: 38.87%

Population by employment status



* Universe: Individuals 15 and older
 Source: Census 2011

Sector of employment



* Universe: Workers 15 and older
 Source: Census 2011

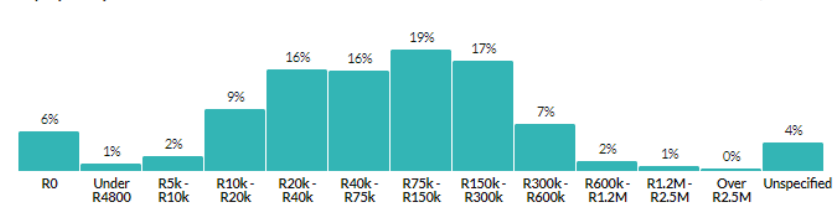
Annual income

R117 000

Average annual income

about double the amount in Gauteng: R57 500
 more than double the amount in South Africa: R30 000

Employees by annual income



* Universe: Employed individuals
 Source: Census 2011

Figure 30: Ward 87 Employment and Income Statistics (<https://wazimap.co.za/profiles/ward-87>)

b) Service Delivery

Ninety-two (92%) of households obtain water from a regional or local service provider, 4% from a borehole, and the remainder from other sources (**Figure 31**).

Water

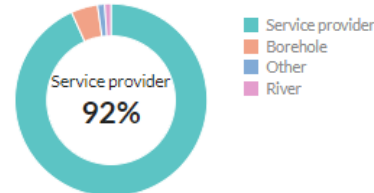
92%

Are getting water from a regional or local service provider

about the same as the rate in Gauteng: 93.52%
about 20 percent higher than the rate in South Africa: 76.89%

Population by water source

Chart Options



Source: Census 2011

Toilet facilities

87.2%

Have access to flush or chemical toilets

about the same as the rate in Gauteng: 85.69%
about 1.4 times the rate in South Africa: 62.52%

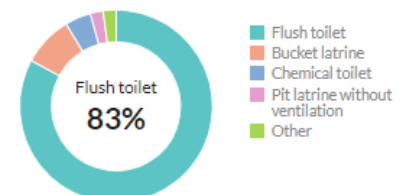
0.8%

Have no access to any toilets

about two-thirds of the rate in Gauteng: 1.19%
less than a fifth of the rate in South Africa: 5.22%

Population by toilet facilities

Chart Options



Source: Census 2011

Figure 31: Ward 87 Housing and Service Delivery

Approximately 87.2% have access to flush or chemical toilets whilst 0.8% of the population have no access to toilets.

(b) Description of the current land uses.

The study area, which is approximately 603 hectares (ha) in extent and comprises of mostly undeveloped land interspersed with gravel roads and is located within a rural setting characterised by agricultural holdings. Historical disturbances within the project area comprises of agricultural fields located within the northern portion of the study area, and an existing, depleted quarry of 16.78ha in extent located within the southeast. The proposed study area is situated on privately owned land and is used for grazing and cattle farming. The road infrastructure within the area is poorly developed and comprises of unsurfaced roads. The Roodeplaats dam is situated approximately 18km east of the proposed study area with the N1 that borders the site to the east.

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

Refer to the sensitivity map (**Figure 32**) which shows sensitive environmental features within the study area.

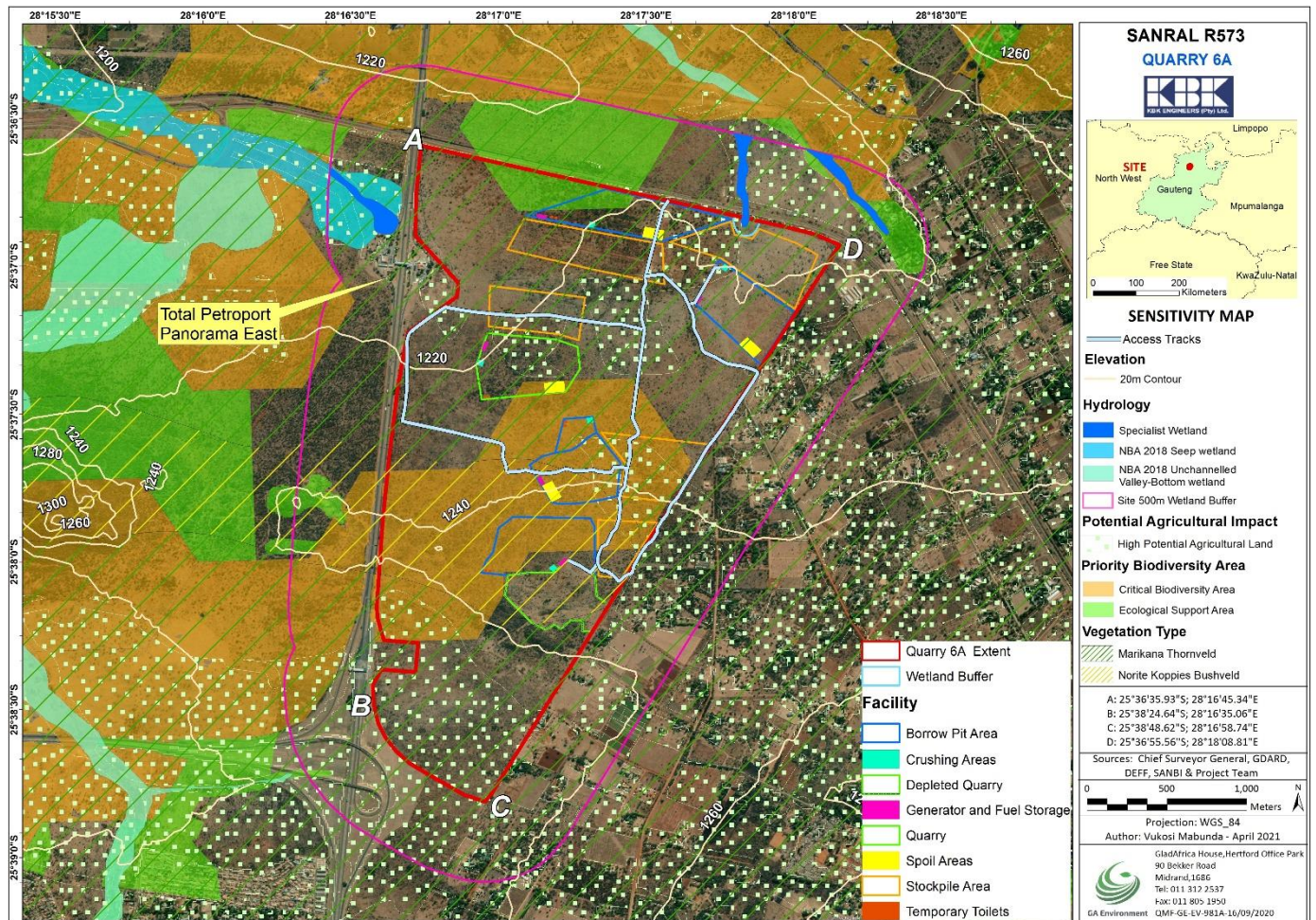


Figure 32: Environmental Sensitivity Map

No infrastructure was identified on site other than water holes for cattle, a kraal and existing fencing (**Figure 33**).



Figure 33: Infrastructure identified on site

(d) Environmental and current land use map.
(Show all environmental, and current land use features)

Figure 34 shows the landcover of the current Quarry 6A site and the surrounding land cover. The area east and south of the site is dominated by an urban/built up area. The area towards the north and east as well as on site are characterised woodland and thicket bushland, bush clumps and high fynbos. On site, the remains of an existing quarry is evident with pockets of wetland towards the north and further south.

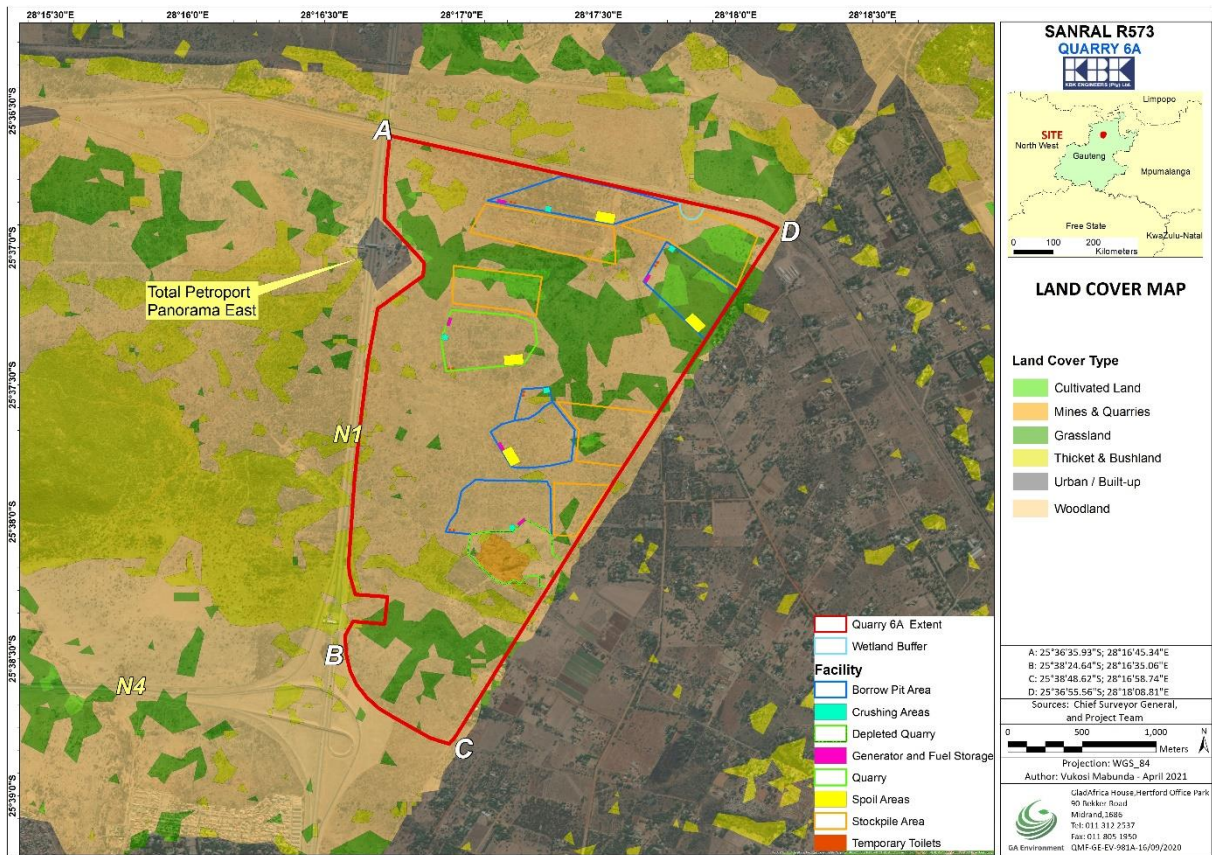


Figure 34: Landcover Map

- 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).

A list of potential impacts and impact ratings is provided in this section. The methodology for determining and ranking the potential impacts are provided in **Section VI**.

1. Impact 1: Change in Topography

Description of the Impact

There will be minimal impact on topography during the construction phase. During the operational phase, there will be a localised change in topography due to the excavation of rock material. It is anticipated that the proposed mining activities will cover an area of approximately 350 hectares. The approximate depth of the Quarry and Borrow Pit will be between 2m and 8m. **Table 9** presents the impact ratings for change in topography.

Table 9: Impact rating for change in topography

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	1 Short term	1 Low	3 Negligible	2 Probable	Y	Low	4-6 Low	4-6 Low
Operational	Negative	1 Site	2 Medium	2 Medium	4-5 Low	4 Definite	Y	Low	8-10 Medium	4-6 Low

Cumulative Impact

The proposed mining activities will alter the topography of the study area and contribute to the cumulative impact as mining activities are present locally. The establishment of additional projects in the area could impact on current topography.

Mitigation measures

- The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint.
- Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations.
- Once localised backfilling is complete, the Quarry shall be shaped as free draining.

2. Impact 2: Removal of Geological Material

Description of the Impact

During the operational phase of the Quarry, geological material will be removed for use as road construction material. This will alter the current underlying geology. It is anticipated that approximately 698 000m³ of material will be removed from the Quarry 6A. **Table 10** provides the impact ratings for the geological impact.

Table 10: Impact rating for the removal of Geological material

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	1 Short term	2 Medium	4-5 Low	2 Probable	Y	Low	4-6 Low	4-6 Low
Operational	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	Low	12-16 High	8-10 Medium

Cumulative Impact

The proposed mining activities will alter the geology of the study area and contribute to the cumulative impact as mining activities are present locally.

Mitigation Measures

- The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint.
- Local depressions within the Quarry pit area shall be backfilled with available material as part of the wider shaping operations.

- Once localised backfilling is complete, the Quarry shall be shaped as free draining.

3. Impact 3: Loss of floral and faunal habitat

Description of Impact

Loss of floral and faunal habitat will take place during the construction phase of the project and continue during the operational phase, mainly as a result of direct clearing of vegetation and rocky habitat prior to excavation of source material. Indirect loss of floral and faunal habitat is also likely to occur as a result of edge effects such as alien vegetation proliferation and encroachment, potential erosion and a decline in faunal refugia, food resources and habitat connectivity. These aspects are likely to result in the loss of and deterioration of CBA: Important Area habitat as well as habitat associated with remnant Endangered Marikana Thornveld vegetation and the Vulnerable Marikana Thornveld Listed Threatened Ecosystem, within which the majority of the project area is located. **Table 11** provides the risk rating for loss of floral and faunal habitat.

Table 11: Impact Ratings for the loss of floral and faunal habitat

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	12-16 High	8-10 Medium
Operational	Negative	1 Site	3 Long term	3 High	6-8 Moderate	4 Definite	Y	High	12-16 High	12-16 High

Cumulative Impact

Development within the project area will lead to direct loss of a significant portion of an intact CBA area, the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- All CBA areas falling outside of the approved development footprint should remain strictly off limits for development and construction and operational personnel and vehicles. These areas should be clearly demarcated on site and access prohibited as a strict No-Go zone.
- Where areas of increased (high and medium) ecological sensitivity can be avoided, these areas should also be off limits to construction vehicles and workers.
- The development footprint areas should be kept as small as possible, and not exceed the proposed development footprint areas (including quarrying, borrow pit and stockpiling).
- Existing access roads should be utilised as far as possible to avoid additional vegetation clearance. No areas should unnecessarily be cleared of natural vegetation and the loss of indigenous vegetation should be limited as far as possible.
- Any new access roads should be carefully planned to avoid areas of increased ecological sensitivity and faunal movement corridors and ecological connectivity between rocky areas should be considered and maintained.
- The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity as far as possible. Only essential quarries and borrow pits should be constructed, preferably in areas of low ecological sensitivity. Should reduction of the number of quarries or alternative locations for stockpiling be considered, location of these should be positioned outside of areas within increased (medium or high) ecological sensitivity.
- A phased approach to quarrying and development activities should be implemented, commencing with infrastructure located within low or medium-low sensitivity areas. A phased approach will also allow faunal species to disperse from the disturbance area.

- Prior to site clearance a detailed search for faunal and floral SCC, and protected tree species should be undertaken in the appropriate season within the development footprint areas. If such species are recorded, a rescue and relocation plan must be developed for approval by the relevant authorities approved and implemented accordingly.
- No natural areas on adjacent properties may be disturbed in any way.
- Dust suppression measures should be implemented during dry or windy conditions.
- Construction vehicles should be restricted to travelling on designated roadways and preferably making use of existing access roads. Vehicle access beyond the designated project footprint areas should be prohibited.
- Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible.
- No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed.
- Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan.
- A rehabilitation plan for the extent of the project area and all areas impacted by the quarrying activities and associated infrastructure must be developed and approved by the relevant authorities for implementation. This rehabilitation plan should consider all disturbed areas and be based on the following principles:
 - The future, post-mining land use of the project area should be taken into consideration.
 - Prior to commencement of site clearance, all available topsoil and upper soil layers, including remaining rocks, containing the seed bank and must be removed and stockpiled separately in such a way to prevent degradation, for use in rehabilitation.
 - Site restoration/ rehabilitation should take place concurrently/ progressively and as areas for rehabilitation become available.
 - When backfilling open voids, the surrounding topography needs to be considered and no large surface depressions should remain post-closure.
 - The rehabilitation surface should be sloped and shaped in such a way to be free draining and to prevent erosion.
 - Sloping of sidewalls should be done to a degree which will support vegetation establishment.
 - Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support adequate vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary amelioration requirements.
 - Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Marikana Thornveld and Norite Koppies Bushveld vegetation types (refer to Section 5.5 and Appendices A and B). The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include as many species as possible.
 - It is recommended that woody tree and shrub species indigenous to the area be planted within the project area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site nursery (if time frames will allow for this) or bought from local indigenous tree cultivators.
 - The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem.
 - Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area.
- Ecological corridors linking sensitive faunal habitats to the larger area along the site boundary must be maintained during the construction and operational phases to ensure faunal movement patterns are not completely restricted.

4. Impact 4: Loss of floral Species diversity and Floral SCC

Description of Impacts

During the operational phase, Loss of floral species diversity may take place during the construction and operational phases of the project as a result of clearing of vegetation for site establishment. During the construction phase of the project, the loss of species diversity and floral SCC can result from the following activities:

- Ongoing excavation of source material from quarries and borrow pits and increasing development footprint areas leading to ongoing loss of habitat and a decrease in floral species diversity.
- Ongoing stockpiling and associated increased disturbance footprint within the project area.
- Ongoing disturbance within the project area and surrounds due to increased human activity and movement of operational vehicles.

- Disturbance beyond the project footprint areas, leading to loss of habitat with increased floral diversity and species with limited representation in the region.
- Illegal harvesting of floral species with a limited representation within the project area or region.
- Accidental fires due to increased human activity.
- Dust generation from unpaved roads impacting on floral species diversity.
- Ongoing proliferation of alien and invasive floral species may outcompete certain floral species.
- Failure to undertake ongoing alien and invasive plants species management during the operational phase of the project.

The impact ratings for the loss of floral species diversity and floral SCC is provided in **Table 12**.

Table 12: Impact ratings for the loss of floral species diversity and floral SCC

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+H)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	4 Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium
Operational	Negative	2 Local	4 Permanent	3 High	9-10 High	4 Definite	Y	High	12-16 High	12-16 High

Cumulative Impacts

Development within the project area will lead to direct loss of a significant portion of an intact CBA area, the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- A walkdown of the development footprint must be undertaken by an ecologist within the appropriate season prior to commencement of construction. Should any SCC be identified to fall within the proposed construction footprint but will not necessarily be impacted on, these SCC shall be clearly marked, and the areas barricaded as a no-go zone. Should the species be impacted on, if such species are recorded, a rescue and relocation plan must be developed for approval by the relevant authorities approved and implemented accordingly.
- All permanent and temporary project infrastructure should avoid areas of increased ecological sensitivity as far as possible.
- Any fires made by construction workers, if unavoidable, should be restricted to designated areas, where accidental spread thereof can be avoided.
- The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered.
- Prior to site clearance a search and rescue plan must be compiled and implemented for any floral SCC and protected tree species deemed to have an increased (high or medium) probability of occurrence. Furthermore, a detailed search for any faunal SCC should also be conducted prior to construction.
- All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high or medium probability of occurring in the project area.
- Should floral SCC be confirmed from the project area, the loss of such species must be actively avoided and floral SCC and habitat for these species should ideally be conserved in situ (GDACE 2006). If this is not possible (due to the location of the resource to be extracted, the size or habit of the species), the following are applicable:
 - Floral SCC should be removed/ rescued from the project footprint and relocated to suitable, similar habitat in the vicinity of the project area under the supervision of a suitably qualified botanist, with prior approval from GDARD to do so.
 - According to the specialist's personal communication with GDARD dated February 2020, only threatened (Red Listed) and Orange listed species indicated for the Gauteng Province (GDARD, 2017) require removal/ rescue. GDARD indicated that relocation of floral species listed as protected

- in terms of the TNCO (No. 12 of 1983) but not of national or provincial conservation concern in Gauteng, is not required.
- Should protected tree species in terms of the National Forests Act (Act No 84 of 1998) such as *Sclerocarya birrea subsp. caffra* or *Pittosporum viridiflorum* be encountered within the project area during any of the proposed project's development phases, a permit for the removal or destruction of these species has to be obtained from DEFF.
 - Should any other floral species listed as being of conservation concern in the Gauteng Province, but not recorded during the current field assessment, be encountered during any development phase of the proposed project, these species must also be rescued and relocated, with prior approval from GDARD to do so. If the species is nationally threatened or listed a NEMBA TOPS species, a permit also has to be obtained from DEFF (previously Department of Environmental Affairs (DEA)).
 - Prior to site clearance, a description of the rescue and relocation process and procedures must be submitted to GDARD for approval. This description must also include a map of the current location of floral SCC to be relocated, a map indicating where the plants will be relocated to and details of how the long-term survival of the plants once relocated will be ensured. If approved by GDARD, the rescue and relocation procedure must be implemented.
 - Any fires made by construction workers, if unavoidable, should be restricted to designated areas, where accidental spread thereof can be avoided.
 - No harvesting of firewood or collection of floral species from natural areas surrounding the project footprint should be allowed by construction workers.

5. Impact 5: Loss of faunal species and disturbance to faunal communities

Description of Impacts

Loss of faunal species will likely take place during the construction and operational phases of the project as a result of clearance of vegetation, and ongoing disturbance within the project area and surrounds due to increased human activity, movement of operational vehicles and activities associated with the continued functioning of the borrow pit and quarry sites. Disturbance to faunal communities will occur during both the construction and operational phases of the project. Elevated levels of disturbance will likely result in local faunal species moving away from the area and a subsequent localised decline in biodiversity (as certain species are more sensitive to disturbances). **Table 13** provides the impact ratings for loss of faunal species and disturbance to faunal communities.

Table 13: Impact Ratings for the Loss of Faunal Species and disturbance to Faunal Communities

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	Local	Permanent	3 High	9-10 High	3 Highly probable	Y	High	12-16 High	8-10 Medium
Operational	Negative	Local	Permanent	3 High	9-10 High	4 Definite	Y	High	12-16 High	12-16 High

Cumulative Impacts

Development within the project area will lead to direct loss of a significant portion of an intact CBA area, the loss of ecological resources and is likely to diminish local and regional biodiversity and available habitat, associated with the region over time.

Mitigation Measures

- Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. Excavation should preferably commence with infrastructure located within low or medium-low sensitivity areas and phasing should focus on a single quarry/ borrow pit at a time in order to limit the extent of active disturbance, including areas subjected to blasting, at any time.
- No areas should be cleared of natural vegetation if not required for construction and operational purposes of the quarries and borrow pits.

- The location and extent of areas of increased ecological importance and sensitivity, identified during the field assessment, should be considered during the pre-construction and planning phases of the project.
- All permanent and temporary project infrastructure should avoid areas of increased ecological sensitivity as far as possible.
- Natural corridors between rocky bushveld outcrop areas, should be considered and maintained to facilitate faunal movement through the project area. This will allow ecological connectivity between areas of increased ecological sensitivity to be maintained. To achieve this, development footprints should remain restricted, CBA areas outside of the development footprint areas should be designated as No-Go areas and the positioning of any new access roads should be carefully considered and located outside of areas of increased ecological sensitivity as far as possible.
- Where areas of increased (high and medium) ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers.
- All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques.
- Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible.
- No wild animals may under any circumstance be handled, removed or be interfered with by construction workers.
- Hunting, killing and collection of fauna is prohibited.
- Any snares or traps found on or adjacent to the site must be removed and disposed of.
- Prior to commencement of the proposed project, a detailed search for faunal SCC should be undertaken and the necessary relocation steps followed if the proposed project places such species at risk, with approval from the relevant authorities.
- If faunal SCC are noted within the project area at any time during the construction phase, quarrying activities must stop, and the relevant authorities must be notified.
- Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats.
- Disturbance to sensitive habitats must be avoided and the project footprint must be clearly demarcated.
- Only essential quarries and borrow pits should be constructed, preferably in areas of low ecological sensitivity.
- No wild animals may under any circumstance be handled, removed or be interfered with by construction workers or any personnel.
- In order to reduce noise pollution, proper maintenance of equipment and vehicles is required, and the implementation of low noise techniques is recommended.
- A phased approach to the excavation activities will allow faunal species to move away from an area prior to blasting being undertaken. Blasting design must be optimised to reduce the area of disturbance.

6. Impact 6: Soil compaction and contamination

Description of Impacts

During the construction and operational phased, heavy equipment traffic could potentially result in soil compaction. The mining activities on site will also result in the loss of the original spatial distribution of the natural soil forms and horizon sequences as the removal of topsoil and subsoil within the project footprint will be undertaken for the establishment of the Quarry. The loss of topsoil could potentially result in a decrease in the rehabilitation and future land use potential of land that has been disturbed. Pollution of soils as a result of ad-hoc spills. Contamination sources are generally unpredictable and often occur as incidental spills or leaks from operational activities **Table 14** presents the impact ratings for soil compaction and contamination

Table 14: Potential Impacts of soil compaction and contamination

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly	Y	Low	8-10 Medium	4-6 Low

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Cumulative Impacts

Other activities that may contribute to the cumulative impact on the soils include overgrazing and associated poor land-management practices. With the expected soil degradation occurring, a decline in the overall soil quality and health, may hinder the soil suitability for the end land use after project closure.

Mitigation measures

- A stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration.
- Topsoils should be excavated and stockpiled separately from the subsoils to be used during the rehabilitation.
- Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility.
- All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site.
- Ensuring that the development is kept within the Construction footprint.

7. Impact 7: Impact of Land Capability

Description of Impacts

Currently the proposed study area is being used for cattle farming. The establishment of a Quarry will result in social urban impact due to the transformation of land from agricultural to mining as well as the loss of land for cattle farming. During the operational and construction phase of the project, topsoil will be removed. As topsoil has a high concentration of organic matter and microorganisms and provides the environment for where most of the Earth’s biological soil activity occurs, the removal of topsoil will alter the land capability status. **Table 15** presents the impact ratings associated with land capability.

Table 15: Impact ratings for land capability

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Other activities that may contribute to the cumulative impact on the soils include overgrazing, and associated poor land-management practices. With the expected soil degradation occurring, a decline in the overall soil quality and health, may hinder the soil suitability for the end land use after project closure. The establishment of additional projects in the area could impact on existing land uses.

Mitigation Measures

- Reinstatement and rehabilitation of disturbed land.
- Take necessary steps to prevent negative impact on surrounding land by ensuring that the development is kept within the Construction footprint.

- The property earmarked for the Quarry shall be acquired by SANRAL through the SANRAL land acquisition process.
- Closure planning to incorporate measures to achieve future land use plans.

8. Impact 8: Impact on surface water resources

Description of Impacts

During the construction and operational phase of the Quarry, changing the quantity and fluctuation properties of the watercourse by for example obstructing water flow could potentially occur through the compaction of soil, clearing of vegetation and changing runoff patterns through free draining of quarries and borrow pits. Construction and maintenance activities will result in earthworks and soil disturbance as well as the disturbance of natural vegetation. This could result in the loss of topsoil, sedimentation of the watercourse and increase the turbidity of the water. Hydrocarbon spillages from vehicles and mining machinery could also result in hydrocarbon concentrations in surface runoff.

In addition, the moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity.

Table 16 provides the impact ratings for surface water resources.

Table 16: Impact Ratings for surface water resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Expected to be low given that activities remain on existing disturbed footprint and do not encroach onto the delineated wetland or buffer. Construction activities may result in low cumulative impact to the water courses within the local catchments and beyond by contributing to loss of wetland zonation through changed water flow patterns. Sedimentation of the watercourse could potentially change hydrological zonation and result in the loss of specialised habitats.

Mitigation measures

- The footprint of activities should remain outside the delineated watercourse boundaries and buffer zones.
- Effective stormwater management should be a priority during the construction and operational phase. This should be monitored as part of the EMP.
- The following measures should be included in the Borrow Pit Development Plan compiled by the successful Contractor:
 - Site personnel and ECOs should monitor and report on the status of quarry outlets in terms of their effect on sedimentation and erosion, with particular attention to outlets close to the watercourse. Fixed point photography should be used to report on the status of outlets.
 - Where water needs to be pumped out, the outlet needs to be monitored for scouring, erosion or sedimentation.
 - If sedimentation is seen to be a problem, steps must be taken to control deposition by, for example, placing hay bales or sand bangs between the outlet and the watercourse.
 - Where scouring or erosion are observed during monitoring, rehabilitation as set out in the Rehabilitation and Monitoring Plan should be implemented.
 - Berms can also be constructed to control stormwater to prevent erosion and sedimentation.
- Sediment traps should be installed between the watercourse and works area.

- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.
- Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.
- Where rehabilitation is required the accompanying rehabilitation plan should be followed.
- Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas.
- Implement an Alien Plant Control Plan as part of the contractor's method statement.
- Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards.
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish.
- Rehabilitate or revegetate disturbed areas.
- Monitoring should be done to ensure that sediment pollution is timeously dressed.
- Sloping of quarry walls, post impact must be done with a slope of 1:3 to 1:4- if not feasible this needs to be highlighted to DWS during the application process eg should a stepped bench approach be required.

9. Impact 9: Impact on ground water resources

Description of Impacts

During the construction and operational phases, potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the Quarry. In addition, the impact on the geology during the mining operations could potentially disturb the flow patterns of the groundwater. It is anticipated that the proposed quarry will be approximately between 2m and 8m deep. **Table 17** provides the impact ratings for groundwater resources.

Table 17: Impact ratings for groundwater resources

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Poor land-management practices may contribute to the cumulative impact on ground water resources.

Mitigation measures

- Water level readings in the core locations where standpipes were established shall be taken prior to the commencement of constructions activities.
- Excavations shall not be deeper than the groundwater depth as advised by the geotechnical investigations.
- Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination.
- Effective stormwater management should be a priority during the construction and operational phase.
- Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean up requirements to ensure correct clean up procedure.

10. Impact 10: Impacts on Air Quality

Description of Impacts

During the construction phase of the project, the activities that will most likely generate emissions are excavations, earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be the haulage of material and vehicular entrainment on unsurfaced dust roads, and the public roads, blasting, crushing and handling of material. These emissions will have an impact on air quality on site as well as the surrounding areas. Borrow pit 2 is situated approximately 40m west from the nearest residential development, stockpile area 3 is approximately 95m and stockpile 4 is situated approximately 210 m. These sites are within close proximity of the residential area and could potentially have an impact on air quality. **Table 18** provides the impact ratings for Air Quality.

Table 18: Impact ratings for air quality

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+H)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Additional emissions from other vehicles could contribute to impacts on the ambient air quality of the region.

Mitigation Measures

- Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions.
- Air quality to be monitored (baseline and during construction) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors.
- Dust monitoring should be implemented around aggregate crushing plants, in particular where these are located in proximity to sensitive receptors in order to monitor if dust levels are exceeding standards and to identify additional dust suppression measures. If it becomes evident that dust emissions from aggregate crushing and screening and extraction of borrow or quarry material are resulting in an impact to sensitive receptors within the Project Area then additional dust suppression measures (and wind breaks if feasible) will need to be considered around these crushing, screening and extraction activities.
- Consideration should be given to scheduling aggregate crushing and hauling activities outside of dry and windy conditions where sensitive receptors may be affected, if feasible.
- The Contractor shall produce method statements for activities with the potential to generate dust emissions.
- The Contractor shall document any air quality / dust complaints raised by communities and record them on a grievance register sheet. Any dust related grievances raised shall be investigated.
- Dust suppression must be considered as part of the design and location of borrow pits, quarries and aggregate crushing plants, and other measures will be implemented to restrict dust-related impacts.
- If the use of watering techniques on exposed open earthworks is not feasible and if it becomes evident that dust emissions from these exposed areas are resulting in an impact to local residents then the use of surface binding agents shall be considered.
- Restrict the project footprint to only what is required.
- Stockpiles shall be protected from wind erosion.
- Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution.
- Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order.
- An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust monitoring results shall be discussed in this committee

11. Impact 11: Noise and Blasting Hazard

Description of Impacts

Activities undertaken during the construction/establishment of the Quarry will generate noise and could potentially affected the adjacent community. These include site establishment and fencing, and vehicle movement. During the

operational phase, noise and vibration will be generated from the blasting and crushing activities undertaken. Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the proposed quarry. Blast hazards include ground vibration, air blast, fly rock, blast fumes and dust. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. During the operational phase noise could also be potentially generated as a result as a result of haulage vehicles, mechanical noise from plant and machinery. Sensitive receptors include residents of Kameeldrift East residents, Rynoue and Roodeplaat, the Transnet operations situated towards the north of the site, the N1 highway and the Petroport. Borrow pit 2 is situated approximately 40m west from the nearest residential development, with stockpile area 3 is approximately 95m and stockpile 4 is situated approximately 210 m. **Table 19** provides the impact ratings for noise and blasting hazards.

Table 19: Impact ratings for noise and blasting hazards

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	8-10 Medium

It should also be noted that noise pollution (disturbance and nuisance) will have different impacts on the different receptors because some are very sensitive to noise while others are not. For example, workers would not expect a noise free working environment and so they will be less sensitive to environmental noise pollution at work. However, neighbouring residents may be sensitive to additional noise and so any change to ambient noise levels because of operation-related noise may have a negative impact on them and their anticipated residential experience. The South African National Standard (SANS) guidelines for noise (SANS 10103, 2008) provides a guideline for estimating community response to an increase in general ambient noise level caused by an intruding noise. In general, an increase of 3 dBA or less will not cause a response from a community; an increase of 3 to 5 dBA may elicit background noise levels to increase. No quantification of the current ambient noise levels for the site were undertaken, however given the rural nature of the site, it is assumed that the SANS limits for rural areas (45 dBA during the day and 35 dBA during the night) would be applicable. The current ambient noise levels surrounding the project area include a combination of sources such as roads, agricultural holdings, and the operation of the Transnet railway line.

Cumulative impacts

The generation of additional noise could contribute to impacts on the ambient noise level experienced in proximity to the site.

Mitigation Measures

- Prior to the commencement of construction activities, baseline monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site. Daily noise monitoring shall be undertaken at sensitive receptors when construction activities occur within 1 km of the receptor, and at mining and crushing area.
- Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements.
- Undertake excavations and crushing only after 07:00 in the morning and before 18:00 in the evening in consultation with adjacent landowners. Sensitive receptors shall be notified of the timing and duration of the construction related activities and the potential noise nuisance it may cause.
- The Contractor shall compile a method statement that describe all measures that will be implemented to control and minimise noise and impacts on biodiversity, people and livestock.
- The Contractor will be required to develop a grievance protocol to manage and address any noise complaints received. Respond to all noise related grievances received and implement mitigation measures.
- A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to 'wear and tear'.
- The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision.
- The excessive idling of stationary trucks will be prevented.

- The Contractor shall implement a blast management plan as per the blast design prior to the implementation of blasting on site.
- A monitoring programme for the recording of blasting operations shall be implemented. The elements of the programme shall include the following:
 - Weather conditions at time of the blast.
 - Video recording of the blast.
 - Fly rock observations.
 - Ground vibration and air blast results.
- The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock and limiting air-blast and noise to acceptable levels.
- The size of explosive charges used for blasting (if required) should be optimised so as to balance breaking capacity against minimising any vibration impact and fly-rock.
- Survey potentially affected structures prior to and after blasting. Pre-mining photographic crack survey shall be undertaken.
- Adjacent landowners and businesses must be notified well in advance about blasting activities and appropriate precautionary measures must be taken.
- Noisy activities (e.g., blasting) are not to be scheduled around critical times (e.g., school exams, religious services/celebrations). Local leaders, school principals, healthcare workers and religious leaders are to be consulted regarding times that may be negatively affected by noise.
- All blast related complaints shall be recorded and closed out by the Contractor.
- According to Transnet blasting within closer than 500m from a railway will require special permission. The Transnet railway line is situated approximately 1km north from the proposed blasting site. The Contractor shall however ensure that Transnet is informed of the proposed blasting activities.
- Blasting will also be undertaken approximately 480m from the N1 highway. The Contractor shall ensure that SANRAL and the Total Petroport Panorama (east and west) is notified of the proposed blasting activities.
- An Environmental monitoring committee shall be established. Such committee shall include the adjacent landowners. The dust monitoring results shall be discussed in this committee.
- An emergency response plan shall be developed taking into consideration sensitive receptors such as the Transnet railway line, Total Panorama underground storage tanks, adjacent boreholes, and residential areas.
- The appointed Contractor shall be responsible to reimburse residents for damages resulting from blasting activities through the grievance procedure

12. Impact 12: Traffic Impacts

Description of Impacts

The R573 Moloto road currently experiences significant traffic volumes. During the construction phase of the project, an increase in the traffic volumes is expected due to the movement of heavy construction vehicles and trucks. During the operational phase on the project, haul trucks would undertake regular trips to and from site to transport the material that has been sourced from the mining activities. **Table 20** provides the impact ratings for traffic impacts.

Table 20: Impact ratings for traffic impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Future development within the region could result in a cumulative impact on road traffic.

Mitigation Measure

- Movement of haulage vehicles shall be restricted to off peak traffic times.
- Implementation of a traffic complaints procedure.
- A traffic management plan shall be compiled and implemented by the Contractor.
- The number of haulage vehicles shall be controlled per day.

13. Impact 13: Visual and Aesthetic Impacts

Description of Impacts

In terms of the aesthetics, the mining activities will impact on the localised sense of place. During the construction phase of the project it is anticipated that construction vehicles in the area as well as excavations will have a potentially negative impact on the surrounding land use. The placement of stockpiles could result in visual intrusion on the adjacent landowners. **Table 21** provides the impact ratings for visual and aesthetic impacts.

Table 21: Impact ratings for Visual and Aesthetic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	8-10 Medium
Operational	Negative	2 Local	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	8-10 Medium

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time.

Mitigation Measures

- Develop material stockpiles only in areas designated on the site plan.
- Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works.
- Control visual intrusion by screening of the site where possible, e.g., screen fencing and earth bunds shall be used where topographically feasible
- Reinstatement and rehabilitation of disturbed areas with vegetation as per the rehabilitation plan or as soon as possible.

14. Impact 14: Cultural and Heritage Impacts

Description of Impacts

The proposed establishment of the Quarry will require removal of topsoil and vegetation during the construction phase and excavations during the operational phase. During the course of such operations it is possible that undiscovered cultural heritage material, including fossils could be unearthed. **Table 22** provides the impact ratings for cultural and heritage impacts.

Table 22: Impact Ratings for Cultural and Heritage Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

While the broader area towards the west of the site is largely undeveloped, future development within could result in a cumulative loss of heritage resources over time.

Mitigation Measures

- Known sites should be clearly marked in order that they can be avoided during construction activities.
- The contractors and workers should be notified that archaeological sites might be exposed during the construction activities.
- Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible.
- All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken.
- Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site.
- Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1).
- If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments and charcoal/ash concentrations) or palaeontological remains are found during the proposed activities, SAHRA must be alerted immediately, and a professional archaeologist or palaeontologist, based on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of significance a Phase 2 rescue operation might be necessary.
- If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow.

15. Impact 15: Socio Economic Impacts

Description of the Impacts

The construction phase of the Quarry 6A will have the following negative impacts:

- Temporary loss of existing land use through clearance of mining areas.
- Temporary use of local road network by delivery and haul vehicles.
- Damage to existing infrastructure eg fences, water hole etc.
- Population influx due to job seekers to the area which could pose a number of risks to the local community.

The operational phase of the Quarry 6A will have the following impacts:

- The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area.
- Proposed development would create a number of local employment and business opportunities during operation.

- Opportunity for skills development and on site training.

Table 23 provides the impact ratings for Socio-Economic Impacts

Table 23: Impact Ratings for Socio-Economic Impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Positive	2 Local	2 Medium	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium Positive	1-3 No Significance

Cumulative Impacts

Construction Phase: Depending on the number of other projects in the area, and the number of labourers may exacerbate the risks.

Operational Phase: Potential cumulative impacts linked to employment and business opportunities would depend on other construction projects being implemented in the same timeframe.

Mitigation Measures

- Employment and procurement opportunities provided to identified communities.
- The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract.

16. Impact 16: Increase in Waste

Description of Impacts

During the construction phase, waste will be generated through the clearance of vegetation, fencing of the site and site establishment. During the operational phase of the Quarry building and domestic waste will be generated. Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area. The potential of incidental spillages that may occur on site will result in contaminated soil which is treated as hazardous waste e.g., chemicals, oils, soil contaminated by spillages, diesel rags. **Table 24** provides the impact ratings for waste.

Table 24: Impact Ratings for the Waste

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential cumulative impacts will depend on the number of projects within the region at the same time.

Mitigation Measures

- A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility.
- Adequate storage facilities for general and hazardous waste.
- Waste receptacles with lids (i.e. weather and vermin proof) for management of waste on site.
- Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill.
- General waste shall be disposed at a landfill at least weekly, or more frequently if required.

17. Impact 17: Safety

Description of Impacts

Criminal activity within the proposed site is rife. The proposed mining activities could serve as an attraction for criminal activity. In addition, the construction and operational activities that will be required for Quarry 6A may have health and safety implications for the personnel that will be working on the project. **Table 25** provides the impact ratings for Safety.

Table 25: Impact Ratings for Safety

Project phase	Nature of impact	Extent	Duration	Intensity	Consequence (E+ D+I)	Probability	Reversibility	Loss of resources	Significance (C X P)	Significance
									Without Mitigation	With Mitigation
Construction	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low
Operational	Negative	1 Site	3 Long term	2 Medium	6-8 Moderate	3 Highly probable	Y	Low	8-10 Medium	4-6 Low

Cumulative Impacts

Potential safety impacts related to criminal activity will depend on construction projects with the same timeframe.

Mitigation Measures

- Access control to the Quarry must be strictly controlled at the entrance, providing access only to approved persons.
- The security fence shall be monitored regularly for vandalism.
- Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project.
- With the exception of the project team members, no persons should be allowed to enter the construction site area.
- The site and crew are to be managed in strict accordance with the OHS Act.
- The contractor must ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of soil, accidents to employees and limiting casual access to the construction site for workers, use of hazardous substances and materials, etc.
- The Contractor must ensure that lists of all emergency telephone numbers / contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.
- The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. The contact details of this emergency centre, including police and ambulance services must be available at prominent locations around the construction site.
- A Health and Safety Officer as well as an independent firm must be appointed to audit the site's compliance with the OHS Act during construction.

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).

In accordance with the NEMA EIA regulations (Government Notice R.982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998)), as amended the Environmental Assessment Practitioner (EAP) is required to assess the significance of potential impacts in terms of the following criteria as outlined in Appendix 1:

- cumulative impacts;
- nature, significance and consequences of the impact and risk;
- extent and duration of the impact and risk;
- probability of the impact and risk occurring;
- the degree to which the impact and risk can be reversed;
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be avoided, managed, or mitigated.

Activities within the framework of the proposed development and their respective construction and operational phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

Construction phase:

This phase refers to all the pre-construction and construction related activities on site, until the contractor leaves the site.

Operational phase:

This includes all post construction activities, including the operation and maintenance of the proposed development.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure. The methodology that will be used comprises of the following four steps:

- Step 1: Identification of positive and negative impacts of the project;
- Step 2: Identification of the significance rating of the impact before mitigation;
- Step 3: Identification of the mitigation measure and the mitigation efficiency; and
- Step 4: Identification of the significance rating of the impact after mitigation;

Activities that will be undertaken to give effect to the proposed development gives rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into the following phases discussed in **Table 26**.

Table 26: Project phases in a development

PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR	
Status Quo	The study area as it currently exists.
Construction Phase	All activities on site up to the start of construction, not including the transport of materials, but including the initial site preparations. This also includes the impacts that would be associated with planning.
Operational Phase	This phase will include, excavations, stockpiling of material, haulage of material.
The activities arising from each of the relevant phases have been included in the impacts assessment tables. The assessment endeavours to identify activities that would require environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.	

Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations (2006) and integrated environmental management series published by the Department of Environmental Affairs and Tourism (DEAT) currently Department of Environment, Forestry and Fisheries (DEFF). In addition to this, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations as amended, Appendices 1 and 2 that an Impact and Risk Assessment process be undertaken for the Basic Assessments and Environmental Impact Reporting. Acronyms have been used in some of the tables to abbreviate some aspects of the assessment criteria. The Assessment Criteria is based on the following:

- Nature of impact;
- Extent (**E**);
- Duration (**D**);
- Intensity (**I**);
- Consequence (**C**); *this will be a combination of Extent (E)+Duration (D) + Intensity (I)*
- Probability (**P**);
- Determination of significance (with or without mitigation); *and is a combination of consequence (C)x Probability (P)*;
- Reversibility of impact; and
- Irreplaceable loss of resources will be defined as loss of resource for the purposes of the Impact Assessment Tables

Each of these is explained in **Table 27**.

Table 27: Assessment Criteria

ASSESSMENT CRITERIA	SCORING
a) Nature of Impact	
This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, how and whether the impact is positive or negative	Scoring does not apply, impact will either be positive or negative
b) Extent (E)	
The physical and spatial size of the impact. This is classified as:	
i) Site The impact could affect the whole, or a measurable portion of the site.	1
ii) Local The impacted area extends only as far as the activity, e.g. a footprint of the specific activity	2
iii) Regional The impact could affect areas such as neighbouring farms, transport corridors and the adjoining towns.	3
iv) National The impact could have an effect on South Africa.	4
c) Duration (D)	
The lifetime of the impact; this is measured in the context of the lifetime of the proposed project.	
i) Short term The impact will either disappear with mitigation or will be mitigated through natural processes (less than 1 year).	1
ii) Medium term The impact will last up to the end of the phases, thereafter it will be entirely negated (1 to 10 years).	2

<p>iii) Long term The impact will continue or last for the entire operational life of the development but will be mitigated by direct human action or by natural processes thereafter.</p>	<p>3</p>
<p>iv) Permanent Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient, thus beyond decommissioning.</p>	<p>4</p>
<p>d) Intensity (I)</p>	
<p>Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as:</p> <p>i) Low The impact alters the affected environment in such a way that the natural processes or functions are not affected.</p> <p>ii) Medium (Moderate) The affected environment is altered, but function and process continue, albeit in a modified way.</p> <p>iii) High Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.</p>	<p>1</p> <p>2</p> <p>3</p>
<p>e) Consequence of Impact (C)</p>	
<p>The anticipated consequence of the impact is determined using the following formula: Consequence = Duration + Extent + Intensity</p> <p>Consequence is rated as:</p> <p>i) Negligible An acceptable impact on natural systems, patterns or processes.</p> <p>ii) Low A small impact on natural systems, patterns or processes, where the environment continues to function but in a modified manner and for which mitigation is desirable but not essential</p> <p>iii) Moderate A substantial alteration of natural systems, patterns or processes, where environmental functions and processes are altered such that they temporarily or permanently cease. Mitigation will be required.</p> <p>iv) High A serious alteration of natural systems, patterns or processes. Impacts may result in the irreversible damage to irreplaceable aspects if mitigation measures are not implemented.</p> <p>v) Very High Very high impact on natural systems, patterns or processes, where environmental functions and processes are altered such that could permanently cease, even with mitigation.</p>	<p>3</p> <p>4-5</p> <p>6-8</p> <p>9-10</p>

		11-12																																																																		
f) Probability (P)																																																																				
<p>This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:</p> <p>i) Improbable The possibility of the impact occurring is very low, due either to the circumstances, design or experience.</p> <p>ii) Probable There is a possibility that the impact will occur to the extent that provisions must be made.</p> <p>iii) Highly probable It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.</p> <p>iv) Definite The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.</p>		1	2	3	4																																																															
h) Significance of impact with or without mitigation																																																																				
<table border="1"> <thead> <tr> <th colspan="2">Score</th> <th colspan="6">Significance = Consequence x Probability</th> </tr> </thead> <tbody> <tr> <td rowspan="4">Probability</td> <td>4</td> <td>Definite</td> <td>4</td> <td>8</td> <td>12</td> <td>16</td> <td>20</td> </tr> <tr> <td>3</td> <td>Highly probable</td> <td>3</td> <td>6</td> <td>9</td> <td>12</td> <td>15</td> </tr> <tr> <td>2</td> <td>Probable</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> </tr> <tr> <td>1</td> <td>Improbable</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td></td> <td></td> <td></td> <td>Negligible</td> <td>Low</td> <td>Moderate</td> <td>High</td> <td>Very High</td> </tr> <tr> <td></td> <td></td> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td colspan="2"></td> <td colspan="6">Consequence</td> </tr> </tbody> </table>								Score		Significance = Consequence x Probability						Probability	4	Definite	4	8	12	16	20	3	Highly probable	3	6	9	12	15	2	Probable	2	4	6	8	10	1	Improbable	1	2	3	4	5				Negligible	Low	Moderate	High	Very High				1	2	3	4	5			Consequence					
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<p>Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. To determine significance of the potential impact/risk, the consequence is multiplied by probability.</p> <p>The classes are rated as follows:</p> <p>i) No significance</p> <p>The impact is not substantial and does not require any mitigation. Score 1-5</p> <p>ii) Low</p> <p>The impact is of little importance but may require limited mitigation. Score 4-6</p>		1-3	4-6																																																																	

<p>iii) Medium (Moderate)</p> <p>The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels. Score 8-10</p>	8-10
<p>iv) High</p> <p>The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Score 12-16</p>	12-16
<p>v) Fatal Flaw</p> <p>The impact presents a fatal flaw and the entire development option or entire project proposal is unacceptable. Score 20</p>	20
<p>g) Reversibility of impact (R)</p>	
<p>The extent to which the impacts are reversible</p> <p>(i) Yes The impact is reversible within two years after construction.</p> <p>(ii) No The impact is reversible within 2 to 10 years after construction.</p>	
<p>g) The degree to which the impact can cause irreplaceable loss of resources</p>	
<p>(i) Low The impact results in the loss of resources but the natural, cultural and social processes/functions are not affected.</p> <p>(ii) Medium The loss of resources occurs but natural cultural and social processes continue, albeit in a modified manner.</p> <p>(iii) High The impact results in irreplaceable loss of resource.</p>	

In order to maintain consistency, all potential impacts that have been identified during the EIA process will be listed in impact assessment tables. The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance of impacts will be determined by considering consequence and probability.

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)

The proposed Quarry 6A will have a moderate to low impact (after mitigation) on the receiving environment. The negative impacts associated with the proposed development are provided below:

- Loss of floral habitat and species diversity.
- Loss of faunal habitat and species diversity.
- Potential loss of land capability and soil contamination.
- Potential ground and surface water contamination.
- Potential increase in noise levels.
- Potential increase in dust levels.
- Visual intrusion and loss of aesthetic value.
- Increase of traffic on local roads.

- Loss and cultural and heritage resources.
- Increase in waste.

The above-mentioned impacts are expected during the operational phase of the project. However, with the application of mitigations measures as provided in the EMPr the potential impacts can be minimised or avoided. Apart from the negative impacts, the proposed project will have positive impacts. These positive impacts are as follows:

- The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area.
- Proposed development would create a number of local employment and business opportunities during operation.
- Opportunity for skills development and on-site training.

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).

Mitigation measure for the proposed Quarry 6A have been provided in **Table 31 & Table 32** of the EMPr report.

ix) Motivation where no alternative sites were considered.

Not applicable as alternatives were considered and provided in **Section 3i** of the report.

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

Quarry 6A is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573.

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

(Including (i) a description of all environmental issues and risks that are 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.)

Please refer to **Section vi** regarding the Methodology used in determining the significance of environmental impacts.

i) Assessment of each identified potentially significant impact and risk

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

Table 28: Assessment of each identified potentially significant impact and risk

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation 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, ablation, 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	SIGNIFICANCE if mitigated
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	<ul style="list-style-type: none"> Change in topography of landscape and drainage pattern due to the excavation of rock material. The impact on topography is permanent. 	Topography	Construction	Low	<ul style="list-style-type: none"> Control through the limiting of the footprint of the proposed mining activities Mining activities shall be demarcated in order to restrict the excavation footprint. Control through the appropriate rehabilitation measures 	Low
			Operational Decommissioning and Closure	Medium		Low
Excavations, Reshaping of the Quarry pit, resurfacing	<ul style="list-style-type: none"> Geological material will be removed from the Quarry. Such impact is unavoidable and permanent. 	Geology	Construction	Low	<ul style="list-style-type: none"> Control through the limiting of the footprint of the proposed mining activities Mining activities shall be demarcated in order to restrict the excavation footprint. Control through the appropriate rehabilitation measures 	Low
			Operational Decommissioning and Closure	High		Medium
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	<ul style="list-style-type: none"> Loss of floral and faunal habitat will take place during the construction phase of the project and continue during the operational phase, mainly as result of direct clearing of vegetation and rocky habitat prior to excavation of source material 	Fauna and Flora	Construction	High	<ul style="list-style-type: none"> Restrict project footprint as per the layout plan. Prevention of the disturbance of the ecosystem Apply mitigation measures provided by the Ecological Specialists Control through the rehabilitation of disturbed areas 	Medium
			Operational	High		High
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	<ul style="list-style-type: none"> During the operational phase, Loss of floral species diversity may take place during the construction and operational phases of the project as a result of clearing of vegetation for site establishment. During the construction phase of the project the loss of species diversity and floral SCC can result from ongoing excavation of source material from quarries and borrow pits and increasing development footprint areas leading to ongoing loss of habitat and a decrease in floral species diversity 	Flora	Construction	High	<ul style="list-style-type: none"> Restrict project footprint as per the layout plan. Prevention of the disturbance of the ecosystem Apply mitigation measures provided by the Ecological Specialists Control through the rehabilitation of disturbed areas 	Medium
			Operational	High		High
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	<ul style="list-style-type: none"> Loss of faunal species will likely take place during the construction and operational phases of the project as a result of clearance of vegetation, and ongoing disturbance within the project area and surrounds due to increased human activity, movement of operational vehicles and activities associated with the continued functioning of the borrow pit and quarry sites. 	Fauna	Construction	High	<ul style="list-style-type: none"> Restrict project footprint as per the layout plan. Prevention of the disturbance of the ecosystem Apply mitigation measures provided by the Ecological Specialists Control through the rehabilitation of disturbed areas 	Medium
			Operational	High		High
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	<ul style="list-style-type: none"> Loss of the original spatial distribution of the natural soil forms and horizon sequences. Potential disturbance on soil includes compaction owing to vehicle traffic and increased surface runoff from the compacted areas; Soil pollution may emanate from petroleum hydrocarbon contamination owing to vehicle and machinery break-down; 	Soils	Construction	Medium	<ul style="list-style-type: none"> Control through the appropriate stripping and stockpiling measures Control of the mining footprint Control through the implementation of a Stormwater Management Plan 	Low
			Operational Decommissioning and Closure	Medium		Low
	<ul style="list-style-type: none"> Social urban impact due to the transformation of land 	Land Capability	Construction	Medium		Low

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation 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, ablation, 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	SIGNIFICANCE if mitigated
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	<ul style="list-style-type: none"> The land capability status will be alternated The commissioning of a Quarry on the proposed site can result in loss of land use for cattle and game farming; 		Operational Decommissioning and Closure	Medium	<ul style="list-style-type: none"> Implementation and management through a rehabilitation and closure plan 	Low
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	<ul style="list-style-type: none"> Changing the quantity and fluctuation properties of the watercourse by for example obstructing water flow. Changes in sediment entering and exiting the system. The moving of soil and vegetation resulting in opportunistic invasions after disturbance and the introduction of seed in building materials and on vehicles. Invasions of alien plants can impact on hydrology, by reducing the quantity of water entering a watercourse, and outcompete natural vegetation, decreasing the natural biodiversity; Surface water runoff due to mining activities can result in soil erosion and impact surface water quality. The compaction of soil and the clearing of vegetation during the operational and construction phase will result in increased surface runoff and soil erosion. Hydrocarbon spillages from vehicles and mining machinery could result in hydrocarbon concentrations in surface runoff. 	Surface water resources (drainage line, wetland and wetland)	Construction	Medium	<ul style="list-style-type: none"> Control through the implementation of a stormwater management plan Control through design measures such as a free draining quarry Implementation and management through a rehabilitation and closure plan 	Low
			Operational Decommissioning and Closure	Medium		Low
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	<ul style="list-style-type: none"> Potential contamination of groundwater due to spillages and leaks of hazardous substances, improper stormwater management, and fuel/oil leaks from vehicles during the operation of the Quarry; Impact of the geology during the mining operations could potentially disturb the flow patterns of the groundwater. 	Groundwater Resources	Construction	Medium	<ul style="list-style-type: none"> Control through the implementation of a stormwater management plan Control through design measures such as a free draining quarry Manage all hazardous substances Implementation and management through a rehabilitation and closure plan 	Low
			Operational Decommissioning and Closure	Medium		Low
Vegetation clearance and stockpiling, Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	<ul style="list-style-type: none"> During the construction phase of the project, the activities that will most likely generate emissions are excavations, earthworks, removal of topsoil and vegetation clearance, and vehicle movement on haulage routes and public roads. In terms of the construction phase, the main sources of particulate emissions would be the haulage of material and vehicular entrainment on unsurfaced dust roads, and the public roads, blasting, crushing and handling of material. 	Air Quality	Construction	Medium	<ul style="list-style-type: none"> Control through frequent dust suppression Control through dust monitoring and recording Speed control measures on traffic 	Low
			Operational Decommissioning and Closure	Medium		Low
Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	<ul style="list-style-type: none"> Activities undertaken during the construction/establishment of the Quarry will generate noise and could potentially affected the adjacent community; Noise and vibration will be generated from the blasting and crushing activities undertaken. Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the proposed quarry. Blast hazards include ground vibration, air blast, fly rock, blast fumes and dust. 	Noise and blasting hazard	Construction	Medium	<ul style="list-style-type: none"> Noise Control through the maintenance of vehicles and equipment Control through the implementation of a blast management plan 	Medium

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation 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, ablation, 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	SIGNIFICANCE if mitigated
	<ul style="list-style-type: none"> Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. Noise generation as a result of haulage vehicles Removal of existing infrastructure during rehabilitation and closure could result in noisy activities Close proximity of blasting to sensitive receptors (N1 highway, Petroport) 		Operational Decommissioning and Closure	Medium		Low
Haulage of Material and transportation	<ul style="list-style-type: none"> Increase in traffic on the local road networks to due haulage; 	Traffic	Construction	Medium	<ul style="list-style-type: none"> Control through the implementation of a traffic management plan Implementation of a traffic complaints procedure 	Low
			Operational Decommissioning and Closure	Medium		Low
Material Stockpiles, excavations, Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	<ul style="list-style-type: none"> During the construction phase of the project it is anticipated that construction vehicles in the area as well as excavations will have a potentially negative impact on the surrounding land use; The placement of stockpiles could result in visual intrusion on the adjacent landowners; 	Visual aesthetic and	Construction	Medium	<ul style="list-style-type: none"> Control visual intrusion by screening where possible Implementation and management through a rehabilitation and closure plan 	Medium
			Operational Decommissioning and Closure	Medium		Medium
Vegetation Clearing, Excavations, Construction of infrastructure	<ul style="list-style-type: none"> During the mining activities, it is possible that undiscovered cultural heritage material, including fossils could be unearthed 	Cultural Heritage and	Construction	Medium	<ul style="list-style-type: none"> Prevent through the reporting and evaluation of any archaeological heritage resource found on site 	Low
			Operational Decommissioning and Closure	Medium		Low
Clearance of vegetation, construction of infrastructure	<p>Construction Phase</p> <ul style="list-style-type: none"> Temporary loss of existing land use through clearance of mining areas; Temporary use of local road network by delivery and haul vehicles; Damage to existing infrastructure eg fences, water hole etc Population influx due to job seekers to the area which could pose a number of risks to the local community <p>Operational Phase</p> <ul style="list-style-type: none"> The mining of the Quarry will result in road material for the upgrading of the R573 and upgrades of local link roads resulting in road safety, improved access, and promotion of future land use development in the area; Proposed development would create a number of local employment and business opportunities during operation; Opportunity for skills development and on site training 	Socio-Economic	Construction	Medium	<ul style="list-style-type: none"> Control access to site from fencing and access gate; Control through the implementation of a traffic management plan Implementation of a traffic complaints procedure Control through the recruitment process is conducted through the community structures established for the contract. Establish platform for community engagement and complaints management procedure 	Low
			Operational Decommissioning and Closure	Positive		Insignificant
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	<ul style="list-style-type: none"> The Clearing of site will result in waste generation (vegetation); Building and domestic waste will be generated during the operation of the Quarry Littering and improper waste storage may attract vermin resulting in a negative visual appeal of the area; Improper disposal of hazardous waste (e.g. chemicals, oils, soil contaminated by spillages, diesel rags). 	Waste	Construction	Medium	<ul style="list-style-type: none"> Control through implementation of a waste management plan 	Low
			Operational Decommissioning and Closure	Medium		Low
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	<ul style="list-style-type: none"> The Quarry activities could server as an attraction for criminal activity. 	Safety	Construction	Medium	<ul style="list-style-type: none"> Control access to site from fencing and access gate; remedy through awareness training and signage 	Low
			Operational	Medium		Low

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation 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, ablation, 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	SIGNIFICANCE if mitigated
			Decommissioning and Closure		<ul style="list-style-type: none"> Appointment of Health and Safety officer to independently monitor safety compliance on site 	

The supporting impact assessment conducted by the EAP in **Section V**.

j) Summary of specialist reports.

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

Table 29: Summary of Specialist Reports

LIST OF STUDIES UNDERTAKEN	RECOMMENDATIONS OF SPECIALIST REPORTS	SPECIALIST RECOMMENDATIONS THAT HAVE BEEN INCLUDED IN THE EIA REPORT (Mark with an X where applicable)	REFERENCE TO APPLICABLE SECTION OF REPORT WHERE SPECIALIST RECOMMENDATIONS HAVE BEEN INCLUDED.
<p>A Terrestrial Biodiversity Assessment was undertaken by Field and Form Landscape Science.</p>	<ul style="list-style-type: none"> No areas should be cleared of natural vegetation if not required for construction and operational purposes and development footprint areas should be kept as small and compact as possible. The loss of indigenous vegetation should be limited where possible. No natural areas on adjacent properties may be disturbed in any way. The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity as far as possible. Only essential quarries and borrow pits should be constructed, preferably in areas of low ecological sensitivity. Where possible, ecological connectivity between areas of increased ecological sensitivity should be considered and maintained. Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers Construction vehicles should be restricted to travelling on designated roadways and preferably making use of existing access roads. Vehicle access beyond the designated project footprint areas should be prohibited. Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible, and existing roads and tracks should be used during construction and operations as far as possible, particularly where site access is through adjacent properties Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area. A rehabilitation plan must be developed for the quarries, borrow pits and associated infrastructure areas such as stockpiles Backfilling of excavations, sloping of sidewalls to a degree which will support vegetation establishment and rehabilitation/ revegetation should take place progressively and as areas become available. The formation of ecological corridors linking sensitive faunal habitats to the larger area must be maintained during the construction and operational phases to ensure faunal movement patterns are not completely restricted The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered, if time frames allow for this. Prior to site clearance a search and rescue plan must be compiled and implemented for any floral SCC deemed to have an increased (high or medium) probability of occurrence. Furthermore, a detailed search for any faunal SCC should also be conducted prior to construction. The loss of floral SCC must be actively avoided and floral SCC and habitat for these species should ideally be conserved in situ). Natural corridors between the quarry sites should be maintained to facilitate faunal movement through the project area. This will allow ecological connectivity between areas of increased ecological sensitivity to be maintained. Where areas of increased ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers. All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible. No wild animals may under any circumstance be handled, removed or be interfered with by construction workers. Hunting/killing/collection of fauna is prohibited. Any snares or traps found on or adjacent to the site must be removed and disposed of. Should any faunal SCC be noted within the project area, quarrying activities must stop, and the relevant authorities must be notified. Input must be provided by a suitably qualified ecologist. Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats 	<p>X</p>	<p>Section V</p>
<p>Heritage Impact Assessment undertaken by Dr Johnny van Schalkwyk</p>	<ul style="list-style-type: none"> Known sites should be clearly marked in order that they can be avoided during construction activities. The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken; Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site; and 	<p>x</p>	<p>Section V</p>

	<ul style="list-style-type: none"> Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). 		
Wetland Assessment undertaken by Limosella Consulting	<ul style="list-style-type: none"> The footprint of activities should remain outside the delineated watercourse boundaries and buffer zones. Effective stormwater management should be a priority during the construction and operational phase. This should be monitored as part of the EMP. The following measures should be included in the Borrow Pit Development Plan compiled by the successful Contractor: <ul style="list-style-type: none"> Site personnel and ECOs should monitor and report on the status of quarry outlets in terms of their effect on sedimentation and erosion, with particular attention to outlets close to the watercourse. Fixed point photography should be used to report on the status of outlets. Where water needs to be pumped out, the outlet needs to be monitored for scouring, erosion or sedimentation. If sedimentation is seen to be a problem, steps must be taken to control deposition by, for example, placing hay bales or sand bangs between the outlet and the watercourse. Where scouring or erosion are observed during monitoring, rehabilitation as set out in the Rehabilitation and Monitoring Plan should be implemented. Berms can also be constructed to control stormwater to prevent erosion and sedimentation. Sediment traps should be installed between the watercourse and works area. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. Where rehabilitation is required the accompanying rehabilitation plan should be followed. Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. Implement an Alien Plant Control Plan as part of the contractor's method statement Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. Rehabilitate or revegetate disturbed areas Monitoring should be done to ensure that sediment pollution is timeously dressed 	X	Section V
Aquatic Assessment undertaken by Limnology	<ul style="list-style-type: none"> Sloping of quarry walls, post impact must be done with a slope of 1:3 to 1:4- if not feasible this needs to be highlighted to DWS during the application process eg should a stepped bench approach be required. 	X	Section V

Specialist reports have been attached to **Appendix F**.

In addition to the Specialist Studied undertaken, according to Regulation 16(1)(v) of the NEMA EIA Regulations 2014, as amended, an Application for Environmental Authorisation must be accompanied by a 'the report generated by the national web based environmental screening tool. The custodian of this report is the Department of Environment, Forestry and Fisheries. The results of the tool are indicated in the Report attached as **Appendix H**.

Page 8 of 15 of the DEA Screening Report indicates that certain Specialist Assessments must be undertaken for the proposed development Quarry 6A. There is however an allowance of the EAP to motivate for the reasons for not including certain assessments in the assessment report. **Table 30** presents these Specialist Assessments/ Studies as well as the motivations behind the EAP's decision of the recommendations behind the undertaking of certain Specialist Assessments/ Studies. The Table also provide reasons for specialist's studies that have not been undertaken.

Table 30: DEFF Screening Tool, Summary of discussions regarding the undertaking of Specialist Assessments

No	Specialist Assessment	EAP Motivation
1	Agricultural Impact Assessment	<p>The proposed Quarry 6A will be constructed within an area that has already been disturbed by cattle grazing, existing rehabilitated quarry and land previously used for agriculture towards the north of the site. The study area is associated with a Critical Biodiversity Area (CBA), and a portion of the study area along its northern boundary is indicated to fall within an ESA. The central portion of the project area comprises rocky bushveld and rocky slope habitat, mainly associated with the Norite Koppies Bushveld vegetation type, while a prominent rocky outcrop borders the existing depleted quarry within the southeast of project area.</p> <p>According to the DEFF screening tool the northern portion of the site has a very high to high sensitivity, with the southern showing a medium sensitivity. Based on the desktop and site assessment undertaken by the EAP it has been noted that the northern section of the site was historically used for agricultural purposes. The site is characterised by a CBA and an ESA as well as rocky outcrops. A depleted Quarry is situated on the southern section of the site. Currently livestock farming is being undertaken on site, however the landowner has been consulted in terms of this EIA process and consent was given to commence with the process. SANRAL will commence with a land acquisition process only once all the relevant authorisations have been received. According to the Terrestrial Biodiversity assessment undertaken approximately 150 hectares of the study area falls within a Rocky Bushveld and Outcrop habitat unit. Such a habitat unit is sensitive in terms of it faunal and floral characteristics. Based on the above, the EAP suggests that an Agricultural Impact Assessment is not required.</p>
2	Archaeological and Cultural Heritage Impact Assessment	<p>The Archaeological and Cultural Heritage theme sensitivity is not shown of the DEFF screening tool. However, in terms of Section 38 (1) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) a Heritage Impact Assessment is required for Quarry 6A. A Heritage Impact Assessment has been undertaken. The report is attached to Appendix F.</p>

3	Palaeontology Impact Assessment	The Palaeontological sensitivity map as provided on the South African Heritage Resources Information System (SAHRIS) was consulted to verify the Palaeontological sensitivity of the proposed study area. In terms of the Palaeontological Sensitivity Map, the site sensitivity is insignificant/zero and no palaeontological studies are required.
4	Terrestrial Biodiversity Impact Assessment	According to the DEFF screening tool, the Terrestrial Biodiversity has a very high sensitivity. A Terrestrial Biodiversity Assessment has been undertaken. The report is attached to Appendix F .
5	Aquatic Biodiversity Impact Assessment	According to the DEFF screening tool, the aquatic biodiversity theme is low, however an aquatic assessment was undertaken for the entire R573-1 project which includes Quarry 6A. An Aquatic Assessment has been undertaken. The report is attached to Appendix F .
6	Hydrology Assessment	The proposed project will not impact on any perennial water courses; hence a hydrological assessment is not required.
7	Noise Impact Assessment	The Quarry will be located in area where the noise level are low. The proposed quarry will generate noise through the construction and operational activities. Blasting will be undertaken approximately 900m from the housing plots situated towards the east of the site. However, the noise generated on site will managed through the EMP. Hence a noise impact assessment will not be required.
8	Traffic Impact Assessment	A Traffic Impact Assessment has been commissioned by KBK Engineers for the upgrade of the R573 Moloto Road. In terms of Quarry 6A, a Traffic Impact Assessment will not be required as the appointed Contractor as traffic issues will be managed through a Traffic Management Plan.
9	Geotechnical Assessment	A Geotechnical Investigation has been commissioned by KBK Engineers in order to determine and assess the material quality on site. A Geotechnical Assessment has been commissioned by KBK Engineers. The report is attached to Appendix F .
10	Climate Impact Assessment	The proposed Quarry 6A will generate emissions through its direct operations and through its value chain. The direct emission will be through the emission of combustion of diesel in equipment and haulage vehicles. Indirect operations will be haulage purchased goods and services e.g., diesel, and capital goods e.g., equipment fleet. The Contractor will use generators on site, hence imported electricity would not be required which is a major contributor to Green House Gas Emissions. Bearing in mind that the proposed operations will be temporary, and the site will be rehabilitated by SANRAL once the construction is completed. A closure certified will be obtained from the DMRE, a Climate Change assessment will not be required.
11	Health Impact Assessment	The proposed mining operations will generate fugitive dust emissions from mining operations and vehicle tailpipe emissions, vehicle

		entrained dust from paved and unpaved roads. In terms of dust, non-toxic and environmentally friendly dust suppression measures will be undertaken on site and on haulage roads to prevent vegetative dust. Regular dust monitoring will be undertaken on site during the construction and operational phases. Ongoing community forum meetings will be held by the Contractor and the adjacent communities to present the findings of the monitoring. Considering the long-term viability of the Quarry, the surfacing of the haulage routes will be undertaken as a control measure for dust. The mitigation measures for dust will be included in the EMPr. A health impact assessment will therefore not be required.
12	Socio-Economic Assessment	In terms of land use change, it is not anticipated that the Quarry will lead to a drastic land use change as the proposed activities is temporary and rehabilitation will be undertaken once the mining activities have been concluded. A section towards the central portion of the site was previously used a Quarry, since then the Quarry has re-vegetated. The main objective for the mining of Quarry 6A is for material sources for the upgrade of the R573 Moloto Road. The proposed road will also relieve the traffic pressure on surrounding link roads. There is a likelihood of temporary employment during the construction & Operational phase of the project. In addition, the proposed Quarry 6A is situated on privately owned land, and land acquisitions are currently underway with the landowner and SANRAL. It is the opinion of the EAP that a Socio-Economic Assessment is not deemed necessary.
13	Ambient Air Quality Impact Assessment	Dust generation during the construction and operational phase of the project will managed according to the dust suppression measures provided in the approved EMPr. Dust outfall monitoring will also be undertaken. The EAP therefore suggests that an Ambient Air Quality Assessment is not necessary.
14	Air Quality Impact Assessment	Dust generation during the construction and operational phase of the project will managed according to the dust suppression measures provided in the approved EMPr. Dust outfall monitoring will also be undertaken. The EAP therefore suggests that an Air Quality Assessment is not necessary.
15	Plant Species Assessment	According to the DEFF screening tool, the plant species theme has a medium and low sensitivity. However, since the biodiversity theme has a very high sensitivity, a Terrestrial Biodiversity Assessment has been commissioned. A Terrestrial Biodiversity Assessment (Fauna and Flora) has been undertaken. The report is provided in Appendix F .
16	Animal Species Assessment	According to the DEFF screening tool, the animal species theme has a medium sensitivity. However, since the biodiversity theme has a very high sensitivity, a Terrestrial Biodiversity Assessment has been commissioned.

		A Terrestrial Biodiversity Assessment (Fauna and Flora) has been undertaken. The report is provided in Appendix F .
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k) Environmental impact statement

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

A summary of the significance of the potential environmental impacts associated with the proposed Quarry 6A is already provided in **Table 28**. The impact assessment confirmed that certain proposed activities (without mitigation) are expected to have impacts of high significance rating in relation to terrestrial biodiversity.

Sensitive Environmental features were assessed, and the findings are as follows:

- The proposed project area, which is 603 hectares (ha) in extent, comprises mostly undeveloped land interspersed with gravel roads and is located within a rural setting characterised by agricultural holdings. Historical disturbances within the project area are evident from historical aerial imagery and comprises of agricultural fields located within the northern portion of the project area, and an existing, depleted quarry of 16.78ha in extent located within the southeast. Currently certain portions of the land are used for cattle farming. The proposed project area is currently privately owned land, and SANRAL will enter into an agreement with the landowner for the acquisition of the land.
- From a heritage perspective no sites, features or objects of cultural significance were identified.
- According to the Wetland Assessment undertaken by Limosella Consulting, one small watercourse was recorded in the north of the study site. The watercourse signature is clear on historical imagery, however this watercourse has been impacted by anthropogenic activities such as the railway and road crossing. and as a result, only a small section remains on the study site with several changes in the hydrology. This watercourse is classified as an episodic drainage area and is therefore unlikely to exhibit wetness condition all year long. A seepage wetland was also identified north east of the site, the mining activities proposed towards the northern boundary of the site will fall within a 500m radius of this seepage wetland. The layout of the Quarry has been designed in manner that a stockpiles and mining activities will be situated out of the 16m buffer around the episodic drainage line.
- In terms of the Aquatic Assessment undertaken by Limnology, the proposed site includes ephemeral systems with stagnant water, hence an aquatic impact assessment method (including aquatic macroinvertebrates and fish population assessment methods) could not be undertaken.
- According to the Terrestrial Biodiversity Assessment, it is evident that large portions of the habitat provided within the project area are largely intact and supported by the increased ecological sensitivity assigned to the project area, as well as the increased probability of floral and faunal SCC to occur. This includes the extent of a Rocky Bushveld and Outcrop habitat unit of high ecological sensitivity, as well as intact Thornveld vegetation of medium ecological sensitivity. The proposed quarry and borrow pit project will have long term negative impacts on faunal and floristic communities through the complete transformation and loss of floral communities and faunal habitats within the development footprint as well as impacts extending outside of the footprint such as increased edge effects and disturbance to fauna in adjacent properties. The loss of these habitats within an urban matrix exacerbates the impacts associated with the loss of habitat, as remaining habitat within this rapidly transforming landscape become increasingly important zones of conservation.

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**

Figure 35 provides a Site layout plan of the preferred alternative.

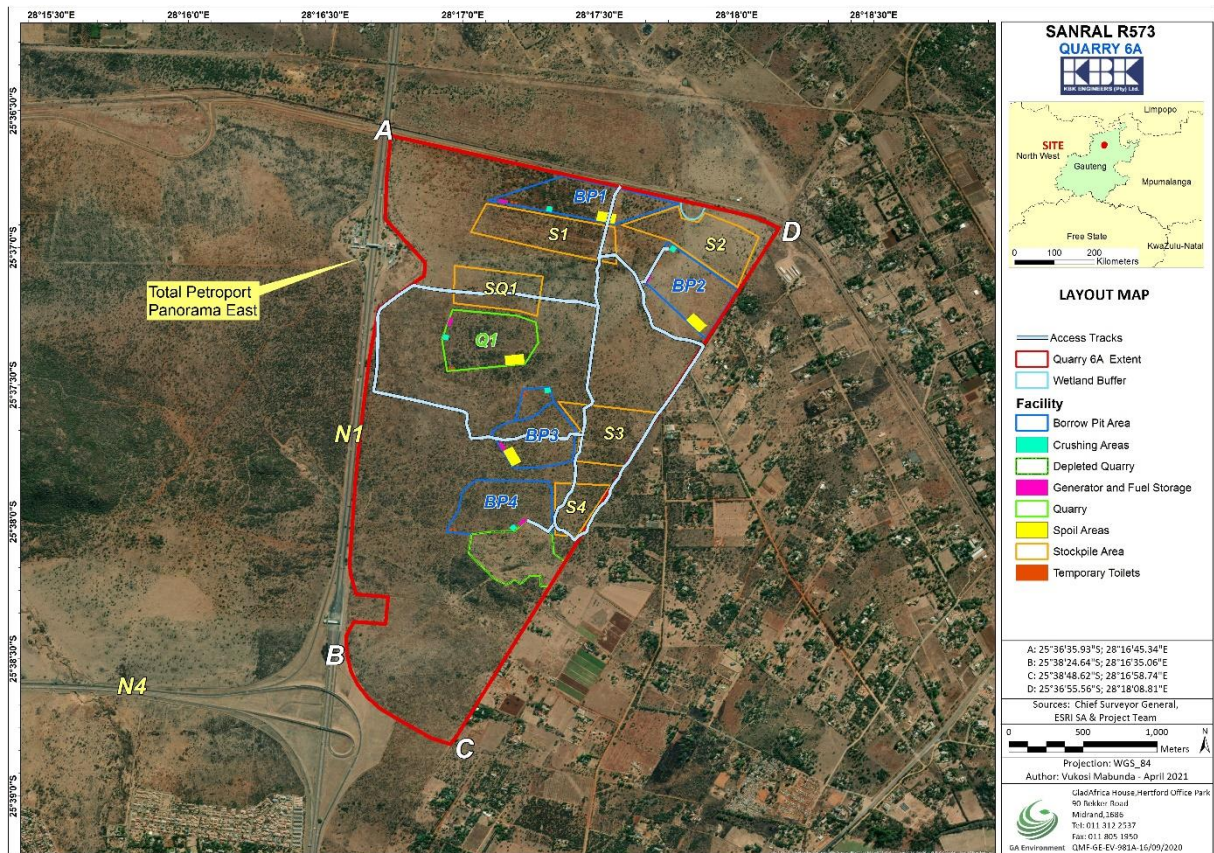


Figure 35: Final Site Layout Map

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

A summary of the positive and negative have been provided in **Section (vii)**.

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

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

The objectives of the EMPr are as follows:

- To ensure compliance with applicable legislation and/or guidelines.
- To ensure that the roles and responsibilities of the various parties involved in the implementation of the EMPr are clearly outlined.
- To reduce adverse environmental impacts as a result of the project activities.
- To ensure continuous improvement in terms of the environmental performance of the project.

The following environmental management objectives are recommended for the proposed Quarry 6A development and associated infrastructure:

- Alien plant monitoring should take place after construction, throughout the lifecycle of the Quarry, as well as post closure of the Quarry.
- Monitor soils so as to avoid unnecessary erosion and implement erosion control measures to preserve the quality of the soil for rehabilitation.
- Development planning must restrict the area of impact to minimum and designated areas only.
- Monitor and prevent contamination and undertake appropriate remedial actions.
- Limit the visual and noise impact on receptors.
- Avoid impact on possible heritage finds.
- Promote health and safety of workers.
- Limit dust and other emissions to within allowable limits.

m) Final proposed alternatives.

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

Quarry 6A is considered to be adequately sized to allow for stockpiling of material, establishment of the Contractors camp, and crushing equipment. The site is relatively undeveloped with a depleted Quarry towards the south east. The material testing undertaken by the geotechnical specialists revealed that the site will provide a viable source of material for the upgrade of the R573. In terms of the preferred lay out alternative, Site Layout Alternative 1 was preferred as the layout was designed whereby the stockpiles are situated out of the 16m calculated buffer for the drainage line.

n) Aspects for inclusion as conditions of Authorisation.

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

The following aspects have been noted by the EAP for inclusion as conditions of the Environmental Authorisation for Quarry 6A:

- An Environmental Management Programme (EMP) for the construction and operational phases must be implemented for the duration of the proposed project. The EMPr is attached to **Appendix G**.
- The Contractor shall consult the ECO prior to confirming the layout of the internal access roads.
- Implementation of the EMPr for the entire life-cycle (i.e. construction, operation, rehabilitation and closure) of the project is considered to be vital in achieving the appropriate environmental management standards as detailed for this project.
- SANRAL is not negated from complying with any other statutory requirements that is applicable to the undertaking of the activity. All necessary permits, licences and approvals must be obtained prior to the commencement of construction.
- SANRAL must appoint a suitably experienced Environmental Control Officer (ECO) for the construction ,operational and rehabilitation phases of the development that will have the responsibility to ensure that the mitigation / rehabilitation measures and recommendations are implemented and to ensure compliance with the provisions of the EMPr.
- Due to the ecological sensitivity of the site, prior to site clearance a search and rescue plan must be compiled and implemented for any floral SCC deemed to have an increased (high or medium) probability of occurrence. Furthermore, a detailed search for any faunal SCC should also be conducted prior to construction by a suitably qualified ecologist.
- Accurate blasting management plans and blasting charge calculations should be developed and/or calculated to ensure that good blasts are achieved without overcharging of the blast holes which will result in the generation of excessive noise and elevated levels of blasting emissions.
- All development activities must be monitored to ensure that the footprint areas do not exceed approved areas.
- All declared alien plants must be identified and managed in accordance with the Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1994), and the implementation of a monitoring programme in this regard is recommended. The Alien Invasive Species Management Plan and the Erosion and Soil Management Plan must be implemented for the duration of the project. The respective plans are attached to **Appendix G**.
- Air quality to be monitored (baseline and during construction and operation) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors.
- Prior to the commencement of construction activities, baseline noise monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site.
- Stormwater Management Plan shall be compiled to describe the design measures that ensure contaminated water is kept separate from clean water run-off through a system of berms, trenches, and erosion protection measures.
- Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner and the Provincial Heritage Resource Agency-Gauteng so that an investigation and evaluation of the finds can be made.
- All adjacent residents shall be informed of the Quarry 30 days prior to site establishment.
- A public complaints register must be available on site to record any issues of concern from the public regarding the project.

- Implementation of the environmental awareness education to the contractor's during and prior to construction and
- Develop a comprehensive Rehabilitation and Closure Plan prior to the decommissioning and closure of the proposed quarry operation.

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

(Which relate to the assessment and mitigation measures proposed)

The following assumption and limitations have been identified for the proposed Quarry 6A development:

Assumptions

- The report has been compiled based on the assumption that KBK Engineers has provided all required information to undertake a complete and accurate assessment.
- The EAP and specialists have identified all possible impacts based on the information provided and these have been assessed and rated accordingly.
- Due to the complexity of natural ecosystems and seasonality of species, it is possible that some aspects pertaining to terrestrial biodiversity, including certain floral species, may have been overlooked during the field assessment, however all effort was made by the consultants to gather and convey accurate information, although the possibility exists that additional information with regard to the project area may come to light at a later stage. It is also important to note that the majority of floral SCC are also known to be extremely seasonal and only flower during specific periods of the year. Prior information on potential threatened flora that may occur in the project area was however known and special emphasis was placed in searching for such species during the field assessment.

Uncertainties

The EMPr that forms part of this EIR provides an assessment of impacts and mitigation measures based on the specialist assessment, site visits, and public participation process. As the impact assessment is a predictive tool, the applicant shall ensure that the require monitoring of the project is undertaken to determine the validity and accuracy of the predictions made. The EMPr shall be improved and refined regularly to ensure that management measures are effective to avoid, minimize and mitigate impacts; and that corrective action is being undertaken to address shortcomings

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.

It is the reasoned opinion of the EAP that the project shall be authorised due to the following reasons:

- As provided in **Section 3 iv 1**, the proposed mining activities will lead to a total loss of terrestrial floral communities and associated faunal habitat within the extent of the proposed development footprint. The main concern is the Rocky Bushveld and Outcrop habitat (**Figure 22**). Sections of the Rocky Bushveld and outcrops which is 167 hectares are characterised by a CBA, earmarked as the highest biodiversity importance in terms of the Mining and Biodiversity Guidelines (2021) as well as a high Control Zone (Zone 2) in terms of the Gauteng Environmental Management Framework (GEMF). This zone is sensitive to development activities. According to the GEMF, only conservation should be allowed in this zone. Based on the above environmental sensitivities and the strategic importance of the project, the EAP recommends that all mitigation measures provided by the Terrestrial Biodiversity Specialists be adhered to in order to ensure that the impacts remain as a medium risk. The proposed project area was previously used for mining activities in the early 2000's. Natural vegetation re-establishment is currently taking place within the depleted cover, although species diversity remains lower than that of the surrounding areas. It is important that rehabilitation is undertaken to the uttermost effective level, hence a comprehensive rehabilitation and Closure Plan prior to the decommissioning and closure of the proposed quarry operation shall be compiled and submitted to the DMRE for approval.
- Should the mitigation measures and monitoring programmes proposed in this document be implemented on site, no fatal flaws could be identified that were deemed so severe as to prevent the activity from continuing.
- The R573 Moloto Road is a National Road which would like together Gauteng, Mpumalanga and Limpopo provinces, economic hubs which will play a role in economic development and upliftment. The R573 Moloto Road upgrade will also facilitate the safe and efficient movement of people and goods and services as well as

an important catalyst for the development of the Moloto Corridor. The R573 Moloto Road upgrade will serve as an impetus to improve feeder road networks while facilitating sustainable economic growth along the entire corridor. In order to address safety, mobility functions and ensure that reasonable access is provided to adjacent properties and areas to enable the future land use development, SANRAL is proposing the upgrade of the R573 Moloto Road. The material required for the proposed project is for the upgrade of the R573 Moloto Road for the use of the local communities, and other commuters.

- Should the proposed Quarry 6A not be authorised, then material from commercial sources will need to be sourced which would not be financially viable due to the required quality and quantity of material;
- The expected long-haul distances from commercial sources could potentially result in a larger carbon footprint and further deterioration to the R573.

Although the proposed development has been assessed to pose significant negative environmental or social impacts that cannot be mitigated to acceptable levels, there are significant positive socio-economic impacts that will emanate from the proposed project, and the development will contribute towards economic growth in line with the countries 'Strategic Infrastructure Projects. The areas of high sensitivity include Rocky bushveld and outcrops which have been identified by the geological investigations as an important source of G1 material (crushed-unweathered rock) which is scarce around the Moloto Road area. The G1 material would be used as the top layer of the road.

It must be noted that there are certain sensitivities on site that are unavoidable. In order to protect biodiversity and conserve sensitive environments during development, steps that should be followed are to firstly avoid, then minimize, then repair or restore, and finally compensate for, or offset (if possible) the negative effects of any development on biodiversity. Thus, where the impact is unavoidable, the impacts must be minimized and the unavoidable and unforeseen impacts restored or rehabilitated.

ii) Conditions that must be included in the authorisation

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

Conditions to be included in the authorisation have already been presented in **Section P** above.

(2) Rehabilitation requirements

It is the recommendation of the EAP that disturbed areas are rehabilitated to a condition fit for grazing and the resumption of ecological function after project closure. Rehabilitation shall be undertaken in line with a comprehensive rehabilitation and Closure Plan to be developed prior to the decommissioning and closure of the proposed quarry operation. The Terrestrial Biodiversity Assessment provided principals for the rehabilitation plan. These principals are provided as follows:

- The future post-mining land use of the project area should be taken into consideration.
- Prior to commencement of site clearance, all available topsoil and upper soil layers containing the seed bank and must be removed and stockpiled separately in such a way to prevent degradation, for use in rehabilitation.
- Site restoration/ rehabilitation should take place concurrently and as areas for rehabilitation become available.
- When backfilling open voids, the surrounding topography needs to be considered and no surface depressions should remain post-closure.
- The rehabilitation surface should be sloped and shaped in such a way to be free draining and to prevent erosion.
- Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support adequate vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary amelioration requirements.
- Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Marikana Thornveld and Norite Koppies Bushveld vegetation types (refer to Section 5.5 and Appendices A and B). The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include as many species as possible.
- It is recommended that woody tree and shrub species indigenous to the area be planted within the project area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site nursery (if time frames will allow for this) or bought from local indigenous tree cultivators.
- The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem.
- Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area.

- Backfilling of excavations, sloping of sidewalls to a degree which will support vegetation establishment and rehabilitation/ revegetation should take place progressively and as areas become available.

q) Period for which the Environmental Authorisation is required.

Environmental Authorisation is required for 10 years.

r) Undertaking

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

The undertaking is provided in **Appendix A**.

s) Financial Provision

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

SANRAL is exempted from having financial provision to be held by DMRE in the form of a bank guarantee. However, budget will be set aside by SANRAL to ensure that this area is rehabilitated and left in a manner that is environmentally safe. This has been confirmed by the DMRE in a meeting held on the 15th of October 2020. The minutes of the meeting are attached to **Appendix E**.

i) Explain how the aforesaid amount was derived.

Refer to the comment provided in **Section U**, under financial provision.

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).

Refer to the comment provided in **Section U**, under financial provision.

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

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

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

Not Applicable, given that the impact assessment methodology used to determine the significance of potential environmental impacts did not deviate from the plan of study outlined in the Final Scoping Report.

ii) Motivation for the deviation.

Not Applicable.

u) Other Information required by the competent Authority

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

(1) Impact on the socio-economic conditions of any directly affected person.

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

The proposed Quarry 6A will be utilised for the upgrades of the R573 Moloto Road and associated link roads. The R573 Moloto Road is one of South Africa's busiest and most important economic routes connecting Gauteng,

Mpumalanga, and Limpopo provinces with an extremely high number of buses and light motor vehicles. The road links small towns and rural settlements with Pretoria and carries inter-district traffic between these locations, hence the road is an important regional mobility function but has an equally significant accessibility function (KBK Engineers, 2020). Should the R573 Moloto Road not be maintained, there will be negative impact on the people, their safety and their livelihoods, furthermore vehicular wear and tear and maintenance results in higher living costs. The approval/commissioning of the proposed Quarry will allow for the proposed Moloto Road Upgrade that will benefit not only local communities and residents but also all road users. The proposed Quarry 6A area is currently used for grazing. Subsequent to the mining activities, the Quarry 6A area will be rehabilitated back to its pre-mining state once mining activities are completed. It is important to note that a land acquisition process is currently underway between SANRAL and the landowner of the property.

(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 Heritage Impact Assessment was undertaken by Dr Johnny van Schalkwyk, no sites, features or objects of cultural significance were identified for the proposed Quarry 6A.

v) 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**).

Not applicable as alternatives have been assessed.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

The Environmental Management Programme report shall be read together with the Environmental Management Programme compiled in terms of the 2014 EIA, Regulations, as amended, (Appendix 4). The Environmental Management Programme is attached to Appendix G of this Environmental Impact Report.

1) Draft environmental management programme.

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

The details and expertise of the EAP are included in Part A, section 3(a).

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

The aspects of the activity that are covered by the draft EMP is included in **Part A (Section d)**.

c) Composite Map

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

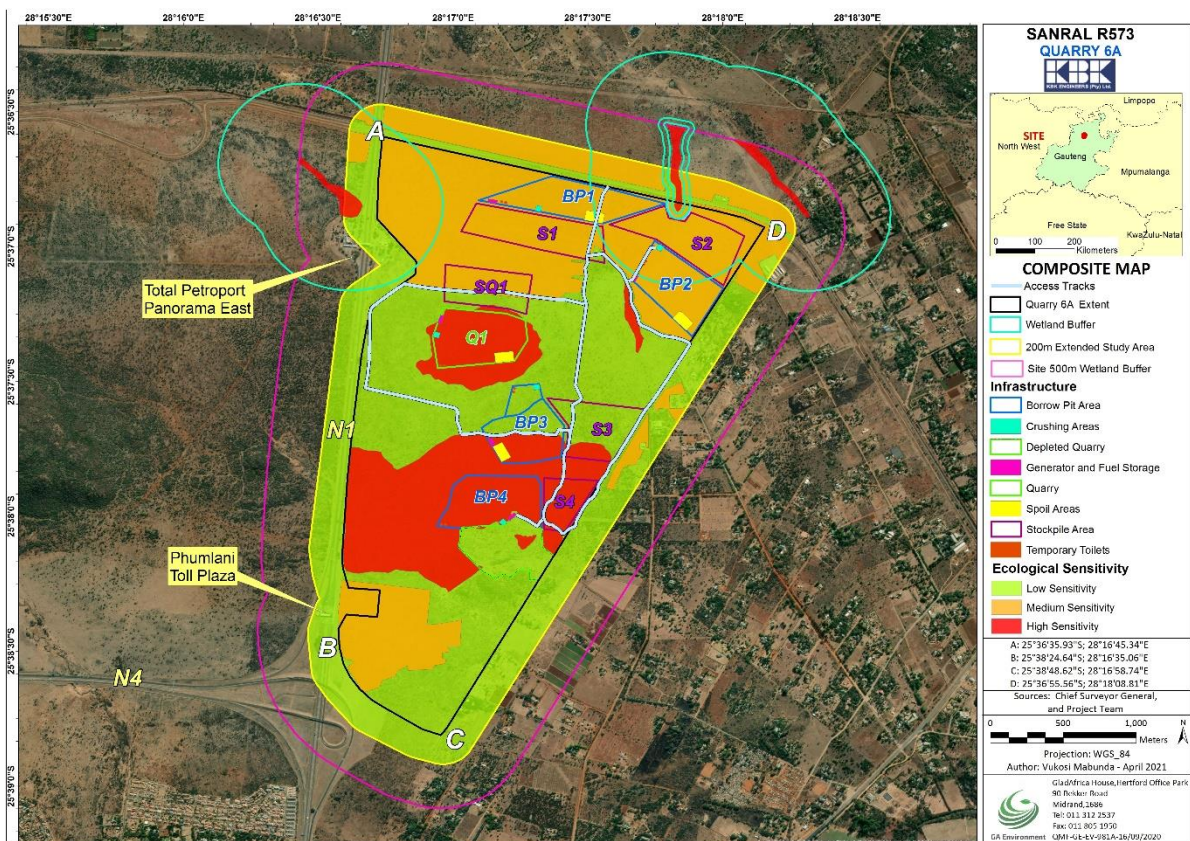


Figure 36: Composite Map

d) Description of Impact management objectives including management statements

- i) **Determination of closure objectives.** (ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The following closure objectives for the proposed Quarry 6A are to:

- Ensure the long-term stability and environmental quality of the site to minimise potential environmental and health risks by the implementation of progressive rehabilitation, as far as possible, throughout the life of the quarry to reduce the rehabilitation efforts required at the time of closure;
- Once the mining activity has ceased, the mining area shall be levelled with topsoil, overburden rocks and revegetated;
- The project area and immediate surrounds must be monitored for erosion and where encountered; immediate rectification must take place;
- The project area and immediate surrounds must be monitored for invasive floral species, and where encountered, these should be eradicated immediately;
- Reduce the visual impact of the Quarry components through rehabilitation of all disturbed land
- All temporary structures (ablution facilities, refuse bin, contractors office) shall be dismantled and removed; and
- The Quarry must be shaped to ensure that no stockpiled heaps remain, and the area blends in with the existing landscape.

ii) The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

The SANRAL will apply mitigation measures as provided in **Table 31 & Table 32** and in the Environmental Management Programme prepared for the operational and construction phases. have been identified in order to manage, prevent and reduce impacts and prevent unnecessary damage to the environment as a result of the proposed project. After decommissioning, SANRAL will rehabilitate the site to a condition fit for the planned future activities of the site.

iii) Potential risk of Acid Mine Drainage. (Indicate whether or not the mining can result in acid mine drainage).

Not applicable, the proposed project does not include any activities which would result in acid mine drainage.

iv) Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

Not Applicable

v) Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

Not Applicable

vi) Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

Not Applicable

vii) Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

Water may be required for dust suppression especially during crushing operations. It is anticipated that a minimal volume of water will be required for the proposed Quarry. The appointed Contractor responsible for the operation of the Quarry 6A, will be responsible for ensuring that the relevant permits/authorisations are in place based on their assessment of suitable water sources.

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

The proposed Quarry 6A fall within the DWS regulated area, hence an application for a Water Use Authorisation will be submitted to the DWS. The project has been loaded and on the DWS Electronic Water Use License Application and Authorisation System (e-WULAAs). The reference number for the application is WU17486. The Water Use Authorisation process will run parallel to the Environmental Authorisation Process. A site visit was undertaken with the DWS on the 24th of March 2021. The meeting notes as well as the attendance register are provided in **Appendix D8**.

ix) Impacts to be mitigated in their respective phases
Measures to rehabilitate the environment affected by the undertaking of any listed activity

Table 31: Impacts to be Mitigated in their respective phases

ACTIVITIES (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.)	PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	ASPECTS AFFECTED	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	Operational, Decommissioning and Closure	Topography	Approximately 350 ha	<ul style="list-style-type: none"> The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint. The Quarry pit shall be backfilled with available material. Once backfilled the Quarry shall be shaped as free draining 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Excavations, Reshaping of the Quarry pit, resurfacing	Operational, Decommissioning and Closure	Geology	Approximately 350 ha	<ul style="list-style-type: none"> The footprint of the proposed mining activities shall be demarcated in order to restrict the excavation footprint. The Quarry pit shall be backfilled with available material. Once backfilled the Quarry shall be shaped as free draining. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Construction, Operational,	Loss of floral and faunal habitat	Approximately 350 ha	<ul style="list-style-type: none"> All CBA areas falling outside of the approved development footprint should remain strictly off limits for development and construction and operational personnel and vehicles. These areas should be clearly demarcated on site and access prohibited as a strict No-Go zone. Where areas of increased (high and medium) ecological sensitivity can be avoided, these areas should also be off limits to construction vehicles and workers. The development footprint areas should be kept as small as possible, and not exceed the proposed development footprint areas (including quarrying, borrow pit and stockpiling), and existing access roads should be utilised as far as possible to avoid additional vegetation clearance. No areas should unnecessarily be cleared of natural vegetation and the loss of indigenous vegetation should be limited as far as possible. Any new access roads should be carefully planned to avoid areas of increased ecological sensitivity and faunal movement corridors and ecological connectivity between rocky areas should be considered and maintained. The location and extent of areas of increased ecological importance and sensitivity should be considered during the pre-construction and planning phases of the project and positioning of project infrastructure should avoid areas of increased ecological sensitivity as far as possible. Only essential quarries and borrow pits should be constructed, preferably in areas of low ecological sensitivity. Should reduction of the number of quarries or alternative locations for stockpiling be considered, location of these should be positioned outside of areas within increased (medium or high) ecological sensitivity. A phased approach to quarrying and development activities should be implemented, commencing with infrastructure located within low or medium-low sensitivity areas. A phased approach will also allow faunal species to disperse from the disturbance area. Prior to site clearance, a detailed search for faunal and floral SCC, and protected tree species should be undertaken in the appropriate season within the development footprint areas. If such species are recorded, a rescue and relocation plan must be developed for approval by the relevant authorities approved and implemented accordingly. No natural areas on adjacent properties may be disturbed in any way. Dust suppression measures should be implemented during dry or windy conditions. Construction vehicles should be restricted to travelling on designated roadways and preferably making use of existing access roads. Vehicle access beyond the designated project footprint areas should be prohibited. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Compliance with the mitigations provided by the specialist 	Throughout construction, operational and decommissioning and closure phases

<p>ACTIVITIES (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.)</p>	<p>PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).</p>	<p>ASPECTS AFFECTED</p>	<p>SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m²)</p>	<p>MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)</p>	<p>COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)</p>	<p>TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.</p>
				<ul style="list-style-type: none"> • Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible. • No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed. • Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species control plan. • A rehabilitation plan for the extent of the project area and all areas impacted by the quarrying activities and associated infrastructure must be developed and approved by the relevant authorities for implementation. This rehabilitation plan should consider all disturbed areas and be based on the following principles: <ul style="list-style-type: none"> ○ The future, post-mining land use of the project area should be taken into consideration. ○ Prior to commencement of site clearance, all available topsoil and upper soil layers, including remaining rocks, containing the seed bank, must be removed and stockpiled separately in such a way to prevent degradation, for use in rehabilitation. ○ Site restoration/ rehabilitation should take place concurrently/ progressively and as areas for rehabilitation become available. ○ When backfilling open voids, the surrounding topography needs to be considered and no surface depressions should remain post-closure. ○ The rehabilitation surface should be sloped and shaped in such a way to be free draining and to prevent erosion. ○ Sloping of sidewalls should be done to a degree which will support vegetation establishment. ○ Topsoil or suitable growing medium should be applied to the surface prior to revegetation to support adequate vegetation growth, and the necessary soil amelioration should be undertaken. Soil analysis may be required to determine the necessary amelioration requirements. ○ Revegetation should, as a minimum, comprise direct seeding of an indigenous grass seed mixture comprising grass species recorded in the study area or species representative of the Marikana Thornveld and Norite Koppies Bushveld vegetation types (refer to Section 5.5 and Appendices A and B). The grass species mixture must comprise both pioneer and climax species, be applied at a density of at least 24kg/ ha and include as many species as possible. ○ It is recommended that woody tree and shrub species indigenous to the area be planted within the project area once topographical reinstatement has taken place and a growing medium has been applied. These species could be cultivated on site from seed collected from site within a shade house or temporary site nursery (if time frames will allow for this) or bought from local indigenous tree cultivators. ○ The post-rehabilitation landscape should be capable of supporting a self-sustaining ecosystem. ○ Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area. • Ecological corridors linking sensitive faunal habitats to the larger area along the site boundary must be maintained during the construction and operational phases to ensure faunal movement patterns are not completely restricted. 		

ACTIVITIES (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.)	PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	ASPECTS AFFECTED	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Construction, Operational,	Loss of floral Species diversity and Floral SCC	Approximately 350 ha	<ul style="list-style-type: none"> • A walkdown of the development footprint must be undertaken by an ecologist within the appropriate season prior to commencement of construction. Should any SCC be identified to fall within the proposed construction footprint but will not necessarily be impacted on, these SCC shall be clearly marked, and the areas barricaded as a no-go zone. Should the species be impacted on, if such species are recorded, a rescue and relocation plan must be developed for approval by the relevant authorities approved and implemented accordingly. • All permanent and temporary project infrastructure should avoid areas of increased ecological sensitivity as far as possible. • Any fires made by construction workers, if unavoidable, should be restricted to designated areas, where accidental spread thereof can be avoided. • The establishment of a temporary site nursery for the purposes of cultivating tree and shrub species for use in revegetation should be considered. • Prior to site clearance a search and rescue plan must be compiled and implemented for any floral SCC and protected tree species deemed to have an increased (high or medium) probability of occurrence. Furthermore, a detailed search for any faunal SCC should also be conducted prior to construction. • All construction and operational personnel must be educated in environmental awareness and be trained to identify floral SCC known to occur in the project area, as well as floral SCC with a high or medium probability of occurring in the project area. • Should floral SCC be confirmed from the project area, the loss of such species must be actively avoided and floral SCC and habitat for these species should ideally be conserved in situ (GDACE 2006). If this is not possible (due to the location of the resource to be extracted, the size or habit of the species), the following are applicable: <ul style="list-style-type: none"> ○ Floral SCC should be removed/ rescued from the project footprint and relocated to suitable, similar habitat in the vicinity of the project area under the supervision of a suitably qualified botanist, with prior approval from GDARD to do so. ○ According to the specialist's personal communication with GDARD dated February 2020, only threatened (Red Listed) and Orange listed species indicated for the Gauteng Province (GDARD, 2017) require removal/ rescue. GDARD indicated that relocation of floral species listed as protected in terms of the TNCO (No. 12 of 1983) but not of national or provincial conservation concern in Gauteng, is not required. ○ Should protected tree species in terms of the National Forests Act (Act No 84 of 1998) such as Sclerocarya birrea subsp. caffra or Pittosporum viridiflorum be encountered within the project area during any of the proposed project's development phases, a permit for the removal or destruction of these species has to be obtained from DEFF; ○ Should any other floral species listed as being of conservation concern in the Gauteng Province, but not recorded during the current field assessment, be encountered during any development phase of the proposed project, these species must also be rescued and relocated, with prior approval from GDARD to do so. If the species is nationally threatened or listed a NEMBA TOPS species, a permit also has to be obtained from DEFF (previously Department of Environmental Affairs (DEA)). ○ Prior to site clearance, a description of the rescue and relocation process and procedures must be submitted to GDARD for approval. This description must also include a map of the current location of floral SCC to be relocated, a map indicating where the plants will be relocated 	<ul style="list-style-type: none"> • Compliance with the Mitigation measures provided in the EIR. • Compliance with the mitigations provided by the specialist 	

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				to and details of how the long-term survival of the plants once relocated will be ensured. If approved by GDARD, the rescue and relocation procedure must be implemented. <ul style="list-style-type: none"> o Any fires made by construction workers, if unavoidable, should be restricted to designated areas, where accidental spread thereof can be avoided. o No harvesting of firewood or collection of floral species from natural areas. surrounding the project footprint should be allowed by construction workers. 		
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Construction, Operational,	Loss of faunal species and disturbance to faunal communities	Approximately 350 ha	<ul style="list-style-type: none"> • Site clearance of the approved footprint must utilise a phased approach to allow faunal species to disperse from the area. Excavation should preferably commence with infrastructure located within low or medium-low sensitivity areas and phasing should focus on a single quarry/ borrow pit at a time in order to limit the extent of active disturbance, including areas subjected to blasting, at any time. • No areas should be cleared of natural vegetation if not required for construction and operational purposes of the quarries and borrow pits. • The location and extent of areas of increased ecological importance and sensitivity, identified during the field assessment, should be considered during the pre-construction and planning phases of the project. • All permanent and temporary project infrastructure should avoid areas of increased ecological sensitivity as far as possible. • Natural corridors between rocky bushveld outcrop areas, should be considered and maintained to facilitate faunal movement through the project area. This will allow ecological connectivity between areas of increased ecological sensitivity to be maintained. To achieve this, development footprints should remain restricted, CBA areas outside of the development footprint areas should be designated as No-Go areas and the positioning of any new access roads should be carefully considered and located outside of areas of increased ecological sensitivity as far as possible. • Where areas of increased (high and medium) ecological sensitivity can be avoided, these areas should be indicated on site and be off limits to construction vehicles and workers. • All vehicles (construction or light motor vehicles) accessing the project must adhere to a 30km/hr speed limit and vigilant driving techniques. • Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified where possible. • No wild animals may under any circumstance be handled, removed or be interfered with by construction workers. • Hunting, killing and collection of fauna is prohibited. • Any snares or traps found on or adjacent to the site must be removed and disposed of. • Prior to commencement of the proposed project, a detailed search for faunal SCC should be undertaken and the necessary relocation steps followed if the proposed project places such species at risk, with approval from the relevant authorities. • If faunal SCC are noted within the project area at any time during the construction phase, quarrying activities must stop, and the relevant authorities must be notified. • Biodiversity education and awareness programmes must be implemented. This programme should form part of the staff induction in which topics such as vigilant driving techniques and the necessary procedures for working in close proximity to sensitive habitats. 	<ul style="list-style-type: none"> • Compliance with the Mitigation measures provided in the EIR. • Compliance with the mitigations provided by the specialist 	

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				<ul style="list-style-type: none"> Disturbance to sensitive habitats must be avoided and the project footprint must be clearly demarcated. Only essential quarries and borrow pits should be constructed, preferably in areas of low ecological sensitivity. No wild animals may under any circumstance be handled, removed or be interfered with by construction workers or any personnel. In order to reduce noise pollution, proper maintenance of equipment and vehicles is required, and the implementation of low noise techniques is recommended. A phased approach to the excavation activities will allow faunal species to move away from an area prior to blasting being undertaken. Blasting design must be optimised to reduce the area of disturbance. 		
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure	Construction, Operational, Decommissioning and Closure	Soils	Approximately 350 ha	<ul style="list-style-type: none"> A stormwater management plan must be compiled and implemented by the Contractor to take the increased surface water run-off rates and volumes and their erosion potential into consideration. Topsoils should be excavated and stockpiled separately from the subsoils to be used during the rehabilitation. Drip trays shall be provided in construction areas for stationary plant and for "parked" plant; Drip trays, sumps and bunds must be emptied regularly, especially before a known rain event and after a rain event, and the contents disposed of at a licensed disposal facility. All vehicles and equipment shall be kept in good working order and serviced regularly; Leaking equipment shall be repaired immediately or removed from the Site. Ensuring that the development is kept within the Construction footprint. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	Construction, Operational, Decommissioning and Closure	Land Capability	Approximately 350 ha	<ul style="list-style-type: none"> Reinstatement and rehabilitation of disturbed land. Take necessary steps to prevent negative impact on surrounding land by ensuring that the development is kept within the Construction footprint. The property earmarked for the Quarry shall be acquired by SANRAL through the SANRAL land acquisition process. Closure planning to incorporate measures to achieve future land use plans. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation clearing, Topsoil removal and stockpiling, Vehicle movement and construction of Infrastructure, Excavations, Reshaping of the Quarry pit, resurfacing	Construction, Operational, Decommissioning and Closure	Surface Water Resources	Approximately 180 ha	<ul style="list-style-type: none"> The footprint of activities should remain outside the delineated watercourse boundaries and buffer zones. Effective stormwater management should be a priority during the construction and operational phase. This should be monitored as part of the EMP. The following measures should be included in the Borrow Pit Development Plan compiled by the successful Contractor: <ul style="list-style-type: none"> Site personnel and ECOs should monitor and report on the status of quarry outlets in terms of their effect on sedimentation and erosion, with particular attention to outlets close to the watercourse. Fixed point photography should be used to report on the status of outlets. Where water needs to be pumped out, the outlet needs to be monitored for scouring, erosion or sedimentation. If sedimentation is seen to be a problem, steps must be taken to control deposition by, for example, placing hay bales or sand bags between the outlet and the watercourse. Where scouring or erosion are observed during monitoring, rehabilitation as set out in the Rehabilitation and Monitoring Plan should be implemented. Berms can also be constructed to control stormwater to prevent erosion and sedimentation. Sediment traps should be installed between the watercourse and works area. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	

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				<ul style="list-style-type: none"> Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area. Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. Where rehabilitation is required the accompanying rehabilitation plan should be followed. Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. Implement an Alien Plant Control Plan as part of the contractor's method statement. Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards. Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish. Rehabilitate or revegetate disturbed areas. Monitoring should be done to ensure that sediment pollution is timeously dressed. 		
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Construction, Operational, Decommissioning and Closure	Ground Water Resources	Approximately 350 ha	<ul style="list-style-type: none"> Water level readings in the core locations where standpipes were established shall be taken prior to the commencement of constructions activities. Excavations shall not be deeper than the groundwater depth as advised by the geotechnical investigations. Emergency machinery and equipment maintenance shall be conducted over a drip tray, or a PVC lining to prevent soil and water contamination. Effective stormwater management should be a priority during the construction and operational phase. Material Safety Data Sheets for the item(s) spilled will be consulted for information concerning clean up requirements to ensure correct clean up procedure. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation clearance and stockpiling, Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Air Quality	Approximately 350 ha	<ul style="list-style-type: none"> Implement dust suppression measures in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions. Air quality to be monitored (baseline and during construction) for dust fallout and particulate matter. Sampling locations to consider major sources of dust and sensitive receptors. Dust monitoring should be implemented around aggregate crushing plants, in particular where these are located in proximity to sensitive receptors in order to monitor if dust levels are exceeding standards and to identify additional dust suppression measures. If it becomes evident that dust emissions from aggregate crushing and screening and extraction of borrow or quarry material are resulting in an impact to sensitive receptors within the Project Area then additional dust suppression measures (and wind breaks if feasible) will need to be considered around these crushing, screening and extraction activities. Consideration should be given to scheduling aggregate crushing and hauling activities outside of dry and windy conditions where sensitive receptors may be affected, if feasible. The Contractor shall produce method statements for activities with the potential to generate dust emissions. The Contractor shall document any air quality / dust complaints raised by communities and record them on a grievance register sheet. Any dust related grievances raised shall be investigated. 	<ul style="list-style-type: none"> Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013) Compliance with the Mitigation measures provided in the EIR. 	

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				<ul style="list-style-type: none"> Dust suppression must be considered as part of the design and location of borrow pits, quarries and aggregate crushing plants, and other measures will be implemented to restrict dust-related impacts. If the use of watering techniques on exposed open earthworks is not feasible and if it becomes evident that dust emissions from these exposed areas are resulting in an impact to local residents then the use of surface binding agents shall be considered. Restrict the project footprint to only what is required. Stockpiles shall be protected from wind erosion. Heavy vehicles and machinery should be serviced regularly to minimise exhaust fume pollution. Diesel generators shall be subject to routine maintenance to keep the engines in optimum working order 		
Blasting, crushing and operation of machinery; demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Noise receptors	Approximately 350 ha	<ul style="list-style-type: none"> Prior to the commencement of construction activities, baseline monitoring shall be undertaken at sensitive receptors (within 1km from the site) and at the site. Daily noise monitoring shall be undertaken at sensitive receptors when construction/operation activities occur within 1 km of the receptor, and at mining and crushing area. Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements. Undertake excavations and crushing only after 07:00 in the morning and before 18:00 in the evening in consultation with adjacent landowners. Sensitive receptors shall be notified of the timing and duration of the construction related activities and the potential noise nuisance it may cause. The Contractor shall compile a method statement that describe all measures that will be implemented to control and minimise noise and impacts on biodiversity, people and livestock. The Contractor will be required to develop a grievance protocol to manage and address any noise complaints received. Respond to all noise related grievances received and implement mitigation measures. A conservative vehicle maintenance schedule will be developed that seeks to reduce any increase in noise / vibration outputs due to 'wear and tear'. The informal use of truck honking systems will be prohibited (especially when in or passing residential areas or schools) and will only be used to prevent vehicle / pedestrian collision. The excessive idling of stationary trucks will be prevented. The contractor shall implement a blast management plan as per the blast design prior to the implementation of blasting on site. A monitoring programme for the recording of blasting operations shall be implemented. The elements of the programme shall include the following: <ul style="list-style-type: none"> Weather conditions at time of the blast. Video recording of the blast. Fly rock observations. Ground vibration and air blast results. The Contractor shall employ industry standard methods to control the impact of blasting and limit the risk of damage to buildings and structures by reducing blast vibrations induced in the rock mass, eliminating fly rock and limiting air-blast and noise to acceptable levels. The size of explosive charges used for blasting (if required) should be optimised so as to balance breaking capacity against minimising any vibration impact and fly-rock. Survey potentially affected structures prior to and after blasting. Pre-mining photographic crack survey shall be undertaken. 	<ul style="list-style-type: none"> Noise standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) SANS 10103 Compliance with the Mitigation measures provided in the EIR. 	

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				<ul style="list-style-type: none"> Adjacent landowners and businesses must be notified well in advance about blasting activities and appropriate precautionary measures must be taken. Noisy activities (e.g., blasting) are not to be scheduled around critical times (e.g., school exams, religious services/ celebrations). Local leaders, school principals, healthcare workers and religious leaders are to be consulted regarding times that may be negatively affected by noise. All blast related complaints shall be recorded and closed out by the Contractor. According to Transnet blasting within closer than 500m from a railway will require special permission. The Transnet railway line is situated approximately 1km north from the proposed blasting site. The Contractor shall however ensure that Transnet is informed of the proposed blasting activities. Blasting will also be undertaken approximately 480m from the N1 highway. The Contractor shall ensure that SANRAL and the Total Petroport Panorama (east and west) is notified of the proposed blasting activities. An emergency response plan shall be developed taking into consideration sensitive receptors such as the Transnet railway line, Total Panorama underground storage tanks, adjacent boreholes, and residential areas. The appointed Contractor shall be responsible to reimburse residents for damages resulting from blasting activities through the grievance procedure 		
Haulage of Material and transportation	Construction, Operational, Decommissioning and Closure	Traffic	Approximately 350 ha	<ul style="list-style-type: none"> Movement of haulage vehicles shall be restricted to off peak traffic times. Implementation of a traffic complaints procedure. A traffic management plan shall be compiled and implemented by the Contractor. The number of haulage vehicles shall be controlled per day. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Traffic Management Plan 	Throughout construction, operational and decommissioning and closure phases
Material Stockpiles, excavations Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Visual and aesthetic	Approximately 350 ha	<ul style="list-style-type: none"> Develop material stockpiles only in areas designated on the site plan. Ongoing clearing of alien invasive vegetation in the disturbed areas associated with the works. Control visual intrusion by screening of the site where possible, eg screen fencing and earth bunds shall be used where topographically feasible Reinstatement and rehabilitation of disturbed areas with vegetation as per the rehabilitation plan or as soon as possible. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Contractor method statement to control and management visual intrusion 	
Vegetation Clearing, Excavations, Construction of infrastructure	Operational, Construction, Decommissioning and Closure	Heritage and cultural resources	Approximately 350 ha	<ul style="list-style-type: none"> Known sites should be clearly marked in order that they can be avoided during construction activities. The contractors and workers should be notified that archaeological sites might be exposed during the construction activities. Should any heritage artefacts be exposed during excavation, work on the area where the artefacts were discovered, shall cease immediately and the Environmental Control Officer shall be notified as soon as possible; All discoveries shall be reported immediately to a heritage practitioner so that an investigation and evaluation of the finds can be made. Acting upon advice from these specialists, the Environmental Control Officer will advise the necessary actions to be taken. Under no circumstances shall any artefacts be removed, destroyed or interfered with by anyone on the site. Contractors and workers shall be advised of the penalties associated with the unlawful removal of cultural, historical, archaeological or palaeontological artefacts, as set out in the National Heritage Resources Act (Act No. 25 of 1999), Section 51. (1). If any evidence of archaeological sites or remains (e.g., remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments and charcoal/ash concentrations) or palaeontological remains are found during the 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Compliance with the mitigations provided by Heritage specialist 	

ACTIVITIES (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.)	PHASE (of operation in which activity will take place. State; Planning and design, Pre-Construction' Construction, Operational, Rehabilitation, Closure, Post closure).	ASPECTS AFFECTED	SIZE AND SCALE of disturbance (volumes, tonnages and hectares or m ²)	MITIGATION MEASURES (describe how each of the recommendations in herein will remedy the cause of pollution or degradation and migration of pollutants)	COMPLIANCE WITH STANDARDS (A description of how each of the recommendations herein will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:-.. Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
				proposed activities, SAHRA must be alerted immediately, and a professional archaeologist or palaeontologist, based on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of significance a Phase 2 rescue operation might be necessary. <ul style="list-style-type: none"> If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow. 		
Clearance of vegetation, construction of infrastructure Excavations and stockpiling	Construction; Operational, Decommissioning and Closure	Socio-Economic	Approximately 350 ha	<ul style="list-style-type: none"> Employment and procurement opportunities provided to identified communities. The Contractor must ensure that the recruitment process is conducted through the community structures established for the contract. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Construction, Operational, Decommissioning and Closure	Waste Generation	Approximately 350 ha	<ul style="list-style-type: none"> A waste management plan shall be compiled and implemented by the Contractor. Waste hierarchy principals-reduce, reuse, recycle shall be implemented. Recyclable waste must be kept separate from general waste and taken to a waste recovery / recycling facility. Adequate storage facilities for general and hazardous waste. Waste receptacles with lids (i.e. weather and vermin proof) for management of waste on site. Hazardous waste shall be stored in a bund wall. Disposal of all hazardous waste at a hazardous waste landfill. General waste shall be disposed at a landfill at least weekly, or more frequently if required. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	Construction, Operational, Decommissioning and Closure	Safety	Approximately 350 ha	<ul style="list-style-type: none"> Access control to the borrow pit must be strictly controlled at the entrance, providing access only to approved persons. The security fence shall be monitored regularly for vandalism. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR 	

e) Impact Management Outcomes

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

Table 32: Impact Management Outcomes

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. <input type="checkbox"/> Modify through alternative method. <input type="checkbox"/> Control through noise control <input type="checkbox"/> Control through management and monitoring <input type="checkbox"/> Remedy through rehabilitation..	STANDARD TO BE ACHIEVED (Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.
Excavation and Stockpiling, Reshaping of the Quarry pit, resurfacing	Change in topography	Topography	Operational,	<ul style="list-style-type: none"> Control through the limiting of the footprint of the proposed mining activities. Mining activities shall be demarcated in order to restrict the excavation footprint. Control through the appropriate rehabilitation measures. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	Throughout construction, operational and decommissioning and closure phases
Excavations, Reshaping of the Quarry pit, resurfacing	Removal of geological material	Geology	Decommissioning and Closure	<ul style="list-style-type: none"> Control through the limiting of the footprint of the proposed mining activities. Mining activities shall be demarcated in order to restrict the excavation footprint. Control through the appropriate rehabilitation measures. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral and faunal habitat	Fauna and Flora	Operational, Construction	<ul style="list-style-type: none"> Restrict project footprint. Prevention of the disturbance of the ecosystem. Control through the rehabilitation of disturbed areas. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Compliance with the mitigations provided by the specialist 	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of floral Species diversity and Floral SCC	Flora	Operational, Construction	<ul style="list-style-type: none"> Restrict project footprint. Prevention of the disturbance of the ecosystem. Control through the rehabilitation of disturbed areas. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Compliance with the mitigations provided by the specialist 	
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Loss of faunal species and disturbance to faunal communities	Fauna	Operational, Construction	<ul style="list-style-type: none"> Restrict project footprint. Prevention of the disturbance of the ecosystem. Control through the rehabilitation of disturbed areas. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. Compliance with the mitigations provided by the specialist 	
Vegetation clearing, Topsoil removal and stockpiling,	Soil compaction and contamination	Soils	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control through the appropriate stripping and stockpiling measures. Control of the mining footprint. Control through the implementation of a Stormwater Management Plan. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR. 	
Vegetation clearing, Topsoil removal and stockpiling,excavations	Loss of land use and land capability	Land capability and transformation of land	Operational, Construction	<ul style="list-style-type: none"> Implementation and management through a rehabilitation and closure plan. 	<ul style="list-style-type: none"> Compliance with the Mitigation measures provided in the EIR 	

Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Pollution of surface water resources	Surface water resources	Construction, Operational; Decommissioning and Closure	<ul style="list-style-type: none"> Control through the implementation of a stormwater management plan. Control through design measures such as a free draining quarry. Implementation and management through a rehabilitation and closure plan. 	Rehabilitation standards/end use objectives
Vegetation Clearing, removal of topsoil and stockpiling,	Pollution of groundwater resources	Groundwater resources	Operational, Construction,	<ul style="list-style-type: none"> Control through the implementation of a stormwater management plan. Control through design measures such as a free draining quarry. Implementation and management through a rehabilitation and closure plan. 	Rehabilitation standards/end use objectives
Vegetation Clearing, Excavations, Construction of infrastructure	Increase in nuisance dust	Air Quality	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control through frequent dust suppression. Control through dust monitoring and recording. 	Dust suppression controls National Dust Control Regulations (GNR 827 of November 2013)
Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Increase in ambient noise levels	Noise receptors	Decommissioning and Closure	<ul style="list-style-type: none"> Noise Control through the maintenance of vehicles and equipment. Control through the implementation of a blast management plan. Control through the implementation of a blast monitoring plan. 	Noise standard requirements of the Occupational Health and Safety Act (No. 85 of 1993) SANS 10103
Clearance of vegetation, construction of infrastructure, excavations, Reshaping of the Quarry pit & resurfacing, removal of infrastructure	Increase in traffic on the local road networks to due haulage;	Traffic	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control through the implementation of a traffic management plan. Implementation of a traffic complaints procedure. 	Traffic Management Plan
Material Stockpiles, excavations Rehabilitation and restoration of disturbed areas, demolition and/or removal of temporary infrastructure	Visual Intrusion	Visual and aesthetic	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control visual intrusion by screening where possible. Implementation and management through a rehabilitation and closure plan. 	Contractor method statement to control and management visual intrusion
Vegetation Clearing, removal of topsoil and stockpiling, construction of infrastructure	Unearthing of underground heritage and archaeological artefacts	Heritage and cultural resources	Operational, Construction; Decommissioning and Closure	<ul style="list-style-type: none"> Prevent through the reporting and evaluation of any archaeological heritage resource found on site. 	Rehabilitation standards/end use objectives
Clearance of vegetation, construction of infrastructure Excavations and stockpiling	Population influx due to job seekers to the area which could pose a number of risks to the local community. Proposed development would create a number of local employment and business opportunities during operation;	Socio-Economic	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control access to site from fencing and access gate. Control through the implementation of a traffic management plan. Implementation of a traffic complaints procedure. Control through the recruitment process is conducted through the community structures established for the contract. 	Rehabilitation standards/end use objectives
Vegetation clearing, Excavations, demolition and/or removal of temporary infrastructure	Increase in waste	Waste Generation	Construction; Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control through implementation of a waste management plan. 	Waste Management Plan
Operation of the Quarry, Rehabilitation and restoration of disturbed areas	The Quarry pit posed a safety risk, and site personnel, community members and livestock could fall into the pit	Safety	Construction, Operational, Decommissioning and Closure	<ul style="list-style-type: none"> Control access to site from fencing and access gate. remedy through awareness training and signage. 	Health and Safety Plan

f) Impact Management Actions

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

Table 33: Impact Management Actions

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...)	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. <input type="checkbox"/> Modify through alternative method. <input type="checkbox"/> Control through noise control <input type="checkbox"/> Control through management and monitoring Remedy through rehabilitation..	TIME PERIOD FOR IMPLEMENTATION Describe the time period when the measures in the environmental management programme must be implemented Measures must be implemented when required. With regard to Rehabilitation specifically this must take place at the earliest opportunity. .With regard to Rehabilitation, therefore state either:- Upon cessation of the individual activity or. Upon the cessation of mining, bulk sampling or alluvial diamond prospecting as the case may be.	COMPLIANCE WITH STANDARDS (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)
All of the above requirements are addressed in Table 32 .				

i) Financial Provision

(1) Determination of the amount of Financial Provision.

- (a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.**

The objectives for closure have been discussed in **Part B Section d (i)**. However, the most critical objective is to ensure that the Quarry 6A footprint would be shaped and rehabilitated in order to allow for the establishment of natural vegetation, and to facilitate the end land use identified for the mining footprint during detailed closure planning.

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

Public participation for the proposed Quarry 6A is ongoing. All comment received to date have been provided in **Appendix D5**. This Environmental Impact Report does include the closure objectives which would be made available to the public for review and comment. A land acquisition process is currently underway between SANRAL and the landowner whereby closure objectives will be further discussed.

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

The entire area utilised for the borrow activities is limited to approximately 350 ha. However, SANRAL will acquire the property which is approximately 603 hectares. The following activities will take place during the decommissioning phase:

- The removal of temporary structures and facilities.
- Removal and appropriate disposal of waste materials.
- Removal of bunded areas.
- Removal of the temporary fence and signage.
- Reshaping of the Quarry Pit.
- Re-grading and resurfacing of the site.
- Re-planting.
- Post rehabilitation monitoring.

In terms of the aerial extent of the rehabilitation, **Figure 35**, shows the site layout and aerial extent of the Proposed Quarry 6A and associated mining activities, depicting the anticipated mining permit area at the time of closure.

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

The decommissioning phase will entail the rehabilitation of the mining site. Upon cessation of the mining activities, the area will be fully rehabilitated. The rehabilitation of the mining area will comply with the minimum closure objectives as prescribed by DMR and the activities as provided in **Part B Section d (i)**, hence the rehabilitation plan is considered to be compatible with the closure objectives identified for the site.

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

SANRAL is exempted from having financial provision to be held by DMRE in the form of a bank guarantee. However, budget will be set aside by SANRAL to ensure that this area is rehabilitated and left in a manner that is environmentally safe. This has been confirmed by the DMRE in a meeting held on the 15th of October 2020. The minutes of the meeting is attached to **Appendix E**.

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

Refer to Section i 1e above.

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**

Table 34: Mechanisms 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
Excavations and stockpiling Reshaping of the Quarry pit, resurfacing Vegetation clearing, Topsoil removal and stockpiling; Vehicle movement and construction of Infrastructure Construction of infrastructure Blasting and Crushing	Alien Invasive Plants	An Alien Invasive Species Control programme must be developed and implemented for all phases of the project	ECO, Contractor	Monthly during the rehabilitation phase. Once rehabilitation work has been completed, invasive species monitoring, and eradication must continue biannually (every six months) for a period of two years.
	Soil Erosion	Management and monitoring of soil stockpiles. Soils must be stored properly and revegetated to prevent erosion and to enable re-use during rehabilitation.	ECO, Contractor	Monthly during the rehabilitation phase, and where encountered, immediate rectification must take place. Once such monitoring must continue biannually (every six months) for a period of two years.
	Groundwater	Monitoring of groundwater levels and potential contamination	ECO, Contractor	Biannual monitoring of boreholes
	Dust	Set up PM ¹⁰ Monitoring sites in the area to monitor dust fall. Regular dust suppression measures.	ECO, Contractor	Daily and Monthly monitoring
	Noise	Compliance with local by-laws and regulations regarding the generation of noise and hours of operation. Noise levels shall be monitored to comply with SANS 10103:2008 and Occupational Health and Safety Act requirements	ECO, Contractor	Daily monitoring
	Blasting	Monitor compliance with blast management plan. Investigation of blast related complaints	ECO, Contractor	As and when required
	Traffic	Implementation of a Traffic Management Plan	ECO, Contractor	Daily Monitoring
	Waste	Implementation of a Waste Management Plan	ECO, Contractor	Daily Monitoring

l) Indicate the frequency of the submission of the performance assessment report.

According to Regulations promulgated in terms of section 107(1) of the MPRDA (GNR 527 of 23 April 2004), Monitoring and Performance Assessments of an environmental management programme or environmental management plan are required. Regulation 55 of GNR 527 indicates that a performance assessment must be undertaken every two years during the active operations until closure of the Quarry is obtained.

The Environmental Control Officer will undertake audits in compliance with the EMP every month and will compile monthly audit reports which will be submitted to the Applicant and the DMR, unless otherwise stated by the DMR in the Environmental Authorisation.

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.

The Environmental Control Officer (ECO) and the Environmental Site Representative (ESR) will be responsible for ensuring that all site employees are given an environmental awareness induction prior to the commencement of site activities. The initial training will be undertaken by the ECO.

The environmental awareness training will aim to:

- Promote general environmental awareness as well as awareness specific to the project.
- Inform personnel about the availability and importance of adherence to the EMP, Environmental Authorization as well as any other permits or licenses issued for the project.

The environmental awareness training programme will include:

- Induction of all personnel in a language and method most suitable.
- Signing of an attendance register and declaration of ensuring environmental protection.

Topics that will be included in the induction include:

- What is the environment and why must it be protected?
- What are the environmental sensitivities of the area in which activities are being undertaken?
- How construction activities can adversely impact of the environment?
- What are the mitigation measures for adverse impacts?
- What is the social responsibility of all site employees during construction?
- How should environmental incidents be recorded?

All new employees will be inducted by the ESR prior to commencing with work on site. Proof of the induction will be kept. Refresher environmental awareness training will be conducted by the ESR as and when the need arises. An example of this is when there is repeated non-compliances. The ESR will ensure daily toolbox talks include alerting the workforce to particular environmental concerns associated with the tasks for that day or the area / habitat in which they are working, etc. Awareness posters and pamphlets must be provided to create environmental awareness throughout the site.

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

All potential risks will be managed and potential environmental impacts prevented or minimised through the implementation of mitigation measures and the EMP. The mitigation measures are provided in **Table 32 and Table 33** and the EMP in **Appendix G**. The appropriate implementation of the EMP would be monitored through regular environmental monitoring by the appointed Environmental Control Officer.

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

To date, no specific information has been requested by the Competent Authority.

2) UNDERTAKING

The EAP herewith confirms

- a) the correctness of the information provided in the reports

 X

- b) the inclusion of comments and inputs from stakeholders and I&APs ;

 X

- c) the inclusion of inputs and recommendations from the specialist reports where relevant; and

 X

- d) the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed;

 X

-END-

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