



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT SCOPING REPORT

**FOR THE PROPOSED TRIZAFIELD WOODSTOCK SAND
QUARRY MINING OPERATION IN RESPECT OF THE
PORTION 19 OF THE FARM WOODSTOCK 397 JP,
MAGISTERIAL DISTRICT OF RUSTENBURG, NORTH WEST
PROVINCE**

DMR FILE REFERENCE NO.: NW/30/5/1/2/2/10189 MR

TRIZAFIELD (PTY) LTD

(REGISTRATION NUMBER: (2018/517807/07))

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

PROJECT INFORMATION

REPORT DETAILS

Report Name: **Draft Scoping Report for the proposed Trizafield Woodstock Sand Mine, located on portion 19 of the farm Woodstock 397 JP, Rustenburg Magisterial District, North West Province**

Report Number: HWR/21-08

Project Number: HWR/21-08/ESCR

Date: 05th August 2021- 30th September 2021

APPLICANT (PROPONENT):

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EXECUTIVE SUMMARY

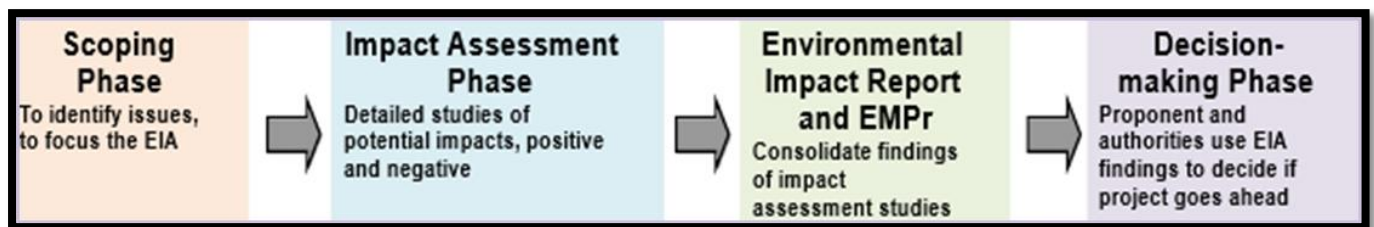
Trizafield (Pty) Ltd has appointed Sakhal and Tobe Environmental (Pty) Ltd, an independent environmental assessment practitioner to conduct environmental impact assessment (**EIA**) process to evaluate the potential environmental and social impacts associated with the proposed Trizafield Woodstock Sand Mine. Trizafield has lodged a Mining Right application in terms of section 22 of the Mineral and Petroleum Resources Development Act (**MPRDA**), 2002 (Act No. 28 of 2002). The right entails mining of Concrete sand (Silica)- QO, Building sand (Silica)- QB, Crusher sand (Silica)- QC, Filling sand (Silica) QL, Foundry sand (Silica)- QF, Glass sand (Silica)- QG, Sand (General)- QY, Silica sand- QD, Attapulgit/Sepiolite Clay, Ball Clay, Bentonite Clay, Clay General, Fuller's Earth (Clay), Illite-Montmorillonite Group (Clay), Kaolin Clay, Nontronite/Saponite Clay, Refractory Clay (Flint), Fire Clay, Shale/Brick Clay, Vermiculite-Chlorite Group (Clay) using conventional truck and shovel opencast mining method.

The proposed Trizafield Woodstock Sand Mine is located approximately 36 km west from the town of Rustenburg and 24 km north of Koster, within the Magisterial District of Rustenburg in the North West Province. Immediate residential areas include Swartruggens, Borolelo, Dithabeneng, Tlhabane, Protea Park and Rustenburg. The project covers an area of about 109.773400 hectares (ha) in extent and lies at geographical coordinates -25.626500° south and -26.909700° east. Access to the site is via a gravel road connected to the N4 national road. The N4 national road straddles (intersect) portion 19 of the farm Woodstock 397 JP. The study area falls within A22D Quaternary Catchment (Dwarsspruit Catchment) of the Crocodile (West) and Marico water management area.

A Scoping and Environmental Impact Assessment process will be conducted for the Environmental Authorisation (**EA**) application lodged with the Department of Mineral Resources and Energy (**DMRE**) as well as an Integrated Water Use License application (**IWULA**) will be lodged with the Department of Water and Sanitation in support of the Mining Right application.

According to the EIA Regulations, interested and affected parties (**I&APs**) must have the opportunity to comment on the proposed project and verify that all the issues raised during the Scoping Phase have been recorded. This is the main purpose of the Scoping Report (**SR**), which will be available for public comment for a period not exceeding 30 days. Comments received during this phase will be considered and addressed in the Environmental Impact Assessment (**EIA/EMPr**) which will be submitted to the DMRE (competent authority) for approval.

AN EIA CONSISTS OF THE FOLLOWING PHASES



PURPOSE OF THIS REPORT

This report addresses the requirements for Scoping Phase and the Plan of Study (PoS) for the Environmental Authorisation Process as outlined in the NEMA regulations and the MPRDA regulations. The aim of this SR is to:

- Provide information to the authorities as well as interested and affected parties (I&APs) on the proposed project;
- Provide information regarding alternatives that are being considered;
- Indicate how I&APs have been and are still being afforded the opportunity to contribute to the project, verify that the issues raised during the scoping phase are incorporated in the impact assessment phase of the environmental authorization process;
- Describe the baseline receiving environment;
- Define the Terms of Reference (ToR) for specialist studies to be undertaken in the Impact Assessment Phase of the EIA; and
- Present the findings of the Scoping Phase in a manner that facilitates input by the I&AP's and decision-making by the relevant authorities.

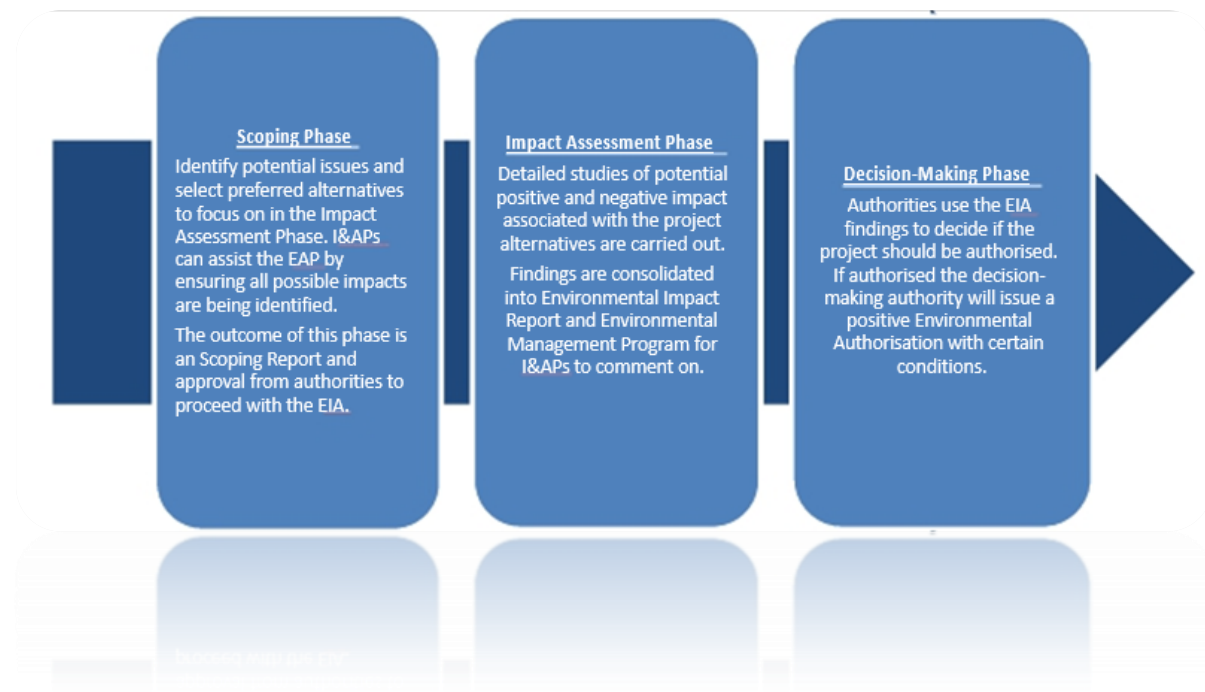
THE PROCESS

As part of the project, the environmental authorizations and licenses required to start the mining operation must be obtained. In order to do so, a Scoping and Environmental Impact Assessment Process (S&EIR) must be undertaken in line with the provisions of the National Environmental Management Act (EIA regulations of April 2017). The S&EIR process and specialist studies to be undertaken will also support the applications for the required licenses and environmental authorizations.

The EIA findings are used by both the applicant and authorities to obtain an objective view of the potential environmental, social and cultural impacts that could arise during mining within the project area and its vicinity.

Measures for the avoidance or mitigation of negative impacts will be proposed and positive impacts will be enhanced. The outcome of the first phase of the S&EIR is the Scoping Report, which provides the basis for undertaking the Impact Assessment Phase of the project.

THE PROCESS IS SUMMARIZED IN THE ILLUSTRATION BELOW



ENVIRONMENTAL BASELINE AND POTENTIAL IMPACTS

To assess these potential impacts the following baseline information will be assessed:

- Air quality impact assessment;
- Hydrological assessment (Surface water)
- Ecological Assessment;
- Soil and land Capability;
- Social Impact Assessment;
- Visual Impact Assessment;
- Noise & Air Quality Impact;
- Traffic Impact; and
- Heritage Impact assessment

The following key environmental issues – potential negative impacts and potential benefits – have been identified:

- Ecology - Introduction of invader species; and the loss of freshwater resources, such as wetlands and pans and riparian habitat (although, where feasible and ecologically viable, these areas will not be mined);
- Botany - Potential loss of vegetation, habitat and endemic species;
- Soils, land use and land capability – Potential loss of agricultural potential;
- Terrestrial fauna – potential impact on faunal habitats;
- Surface and Ground water – Potential impact on surface water quality and flows;
- Visual and Sense of Place – Visual impacts associated with mining infrastructure, landscape alteration and vegetation loss;
- Socio-economic – Job security, continued investment in local economy and negative impacts associated with mine closure; and
- Heritage – Potential impacts on sites of archaeological or palaeontological significance.

WAY FORWARD

The EIA process is being carried out in accordance with the NEMA 2017 EIA regulations. Each of the specialist's studies will undertake a detailed EIA assessment. Included in this report is a detailed plan of study provided by each of the appointed specialists to be implemented during the EIA phase. Potential impacts identified during the Scoping and EIA will be assessed by the specialists for each feasible development alternative and for each phase of the project. The EIA and specialist studies will provide input into the EMPR which will provide the necessary action plans and management measures to mitigate the identified impacts.

This Scoping study has been undertaken with the aim of identifying potential positive and negative impacts on the environment and gathering issues, concerns and queries from I&APs. The Scoping report documents the process followed, the findings and recommendations of the Scoping Phase study, and the proposed Plan of Study for the EIA Phase to follow.

The way forward recommended by this study is as follows:

- Make the Scoping Report available for public comment for a period of 30 calendar days;
- Submit the Scoping Report to the competent authority for permission to undertake the Impact Assessment Phase of the project;
- Upon approval of the Scoping Report, all I&APs are to be notified of the conditions of the Department of Mineral Resources for proceeding with the Impact Assessment Phase of the project;
- Execute the Plan of Study for Impact Assessment during the Impact Assessment Phase of the project.

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LIST OF ABBREVIATIONS

AIA	Archaeological Impact Assessment
ASAPA	Association of Southern African Professional Archaeologists
BID	Background Information Document
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983)
CSA	Constitution of South Africa (Act No. 108 of 1996)
DEA	Department of Environmental Affairs
DEDECT	Department of Economic Development, Environment, Conservation and Tourism
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act (ECA), 1989 (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GN	Government Notice
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IEM	Integrated Environmental Management
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
MPRDA	Minerals and Petroleum Resources Development Act (Act No. 28 of 2002) (as amended)
NEMA	National Environmental Management Act (EIA regulations of April 2017)
NEMAQ A	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)

NWA	National Water Act, 1998 (Act No. 36 of 1998)
OHSA	Occupational Health and Safety Act (Act No. 85 of 1993)
PPP	Public Participation Process
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SR	Scoping Report

1 INTRODUCTION

1.1 BACKGROUND

Trizafield (Pty) Ltd (herein referred to as "**Trizafield**"), a South African mining company duly incorporated in 2018 in terms of section 14 of the Companies Act, 2008, with the Companies and Intellectual Property Commission (CIPC) of the Republic of South Africa is engaged in mineral exploration, mining and mineral processing.

Trizafield has lodged an application for a Mining Right in terms of section 22 of the Mineral and Petroleum Resources Development Act (MPRDA), 2002 (Act No. 28 of 2002). The proposed Trizafield Woodstock Sand Mine is located on portion 19 of the farm Woodstock 397 JP, within the Magisterial District of Rustenburg, North West Province. The proposed mining operations are located approximately 36 km west from the town of Rustenburg and 24 km north of Koster, within the Magisterial District of Rustenburg in the North West Province. The study area falls within A22D Quaternary Catchment (Dwarsspruit Catchment) of the Crocodile (West) and Marico water management area.

The proposed small-scale mining operation will involve mining of Concrete sand (Silica)- QO, Building sand (Silica)- QB, Crusher sand (Silica)- QC, Filling sand (Silica) QL, Foundry sand (Silica)-QF, Glass sand (Silica)- QG, Sand (General)- QY, Silica sand- QD using truck and shovel mining method. The operation will have following support infrastructure:

- Processing plant (wash plant);
- Run of Mine (RoM) stockpiles;
- Mobile office complex;
- Process water reservoir/tank/dam;
- Portable water tank (Jojo Tanks);
- Ablution facility;
- Store house;
- Workshop;
- 1x 20 tTonne Komatsu Excavator (or similar);
- 1x 20 Tonne Komatsu Front End Loader (or similar);
- 2x 18 m³ Tipper Truck;

- 1x 12 000 litre Water Bowser for dust suppression;
- Weigh-bridge;
- Security gate (boom gate) and fence (five strand barbed wire or Clear-Vu fence).

The extent of the area applied for covers approximately 109.773400 hectares. The life of mine (LoM) is estimated at 30 (thirty) years with Run of Mine (RoM) of 10 000 tonnes per month (tpm). The construction phase is expected to commence in the 1st quarter (Q1) of 2022, with first saleable product delivered in March of 2022. Process water supply will be sourced from the farm dam located on portion 19 of the farm Woodstock 397 JP (alternatives will include developing new groundwater abstraction boreholes on site).

Trizafield has appointed Sakhal and Tobe Environmental (Pty) Ltd, as an independent environmental assessment practitioner, to conduct an environmental impact assessment (EIA) process to evaluate the potential environmental and social impacts of the proposed Trizafield Woodstock Sand Mine. A scoping and environmental impact assessment process will be conducted for the Environmental Authorisation application as well as integrated water use licence application (IWULA). An application for Environmental Authorisation (EA) in term of Section 16 of the NEMA EIA 2017 regulations was submitted to the DMRE.

This Scoping Report has been designed to meet the requirements for conducting an EIA and Environmental Management Programme (EMPR) as stipulated in the Regulations contained in both the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002-(MPRDA) and National Environmental Management Act (NEMA): EIA regulations of April 2017, respectively.

1.2 ASSUMPTIONS AND LIMITATIONS

As it is standard practice, this Scoping Report is based on a number of assumptions and is subject to certain limitations. These are as follows:

- It is assumed that information provided by the applicant and the specialists once the reports are compiled will be accurate;
- A more detailed project description will be presented in the Impact Assessment Phase; and

- Detailed assessment of the potential positive and negative environmental impacts of the proposed development will only be undertaken during the Impact Assessment Phase.

Notwithstanding the above, Sakhal and Tobe Environmental is confident that these assumptions and limitations do not compromise the overall findings of this report.

1.3 FULL PARTICULARS OF THE APPLICANT AND MINE PLAN

1.4 APPLICANTS DETAILS

Table 1-1: Details of the Applicant

Name of Applicant	Trizafield (Pty) Ltd
Company Registration No.:	2018/517807/07
Physical Address	2 Kgwebo Street Waterval East, Rustenburg, 0299
Postal address	2 Kgwebo Street Waterval East, Rustenburg, 0299
Contact Person	Mr. Martin Smit
Tel no	(+27) 014 597 1272
Name of the Mine	Trizafield Woodstock Sand Quarry
E-mail address	Sandcor@lantic.net

1.5 DETAILS OF THE CONSULTANT

Table 2-2: Consultant's Details

ITEM	CONSULTANT CONTACT DETAILS (If applicable)
Name	Sakhal and Tobe Environmenta (Pty) Ltd
Contact Person	Mr. Mandla Melvyn Masango
Qualifications	BSc. Honours in Earth Sciences and Hydrology (specializing as a Hydrogeologist)
Professional Body (If Registered)	South African Council for Natural Scientific Professions (SACNASP) (Registration Number: 115441)
Tel no	072 844 5584
Fax no:	086 560 4741
Cellular no	072 714 8556
E-mail address	mandlamasango@outlook.com mandla@stenvironmental.co.za
Postal address	Spaces, Lone Creek Crescent, Waterfall, Midrand, 1686

Table 1-2: Resource Particulars

ITEM	DETAILS
TYPE OF MINERAL	Concrete sand (Silica)- QO, Building sand (Silica)- QB, Crusher sand (Silica)- QC, Filling sand (Silica) QL, Foundry sand (Silica)- QF, Glass sand (Silica)- QG, Sand (General)- QY, Silica sand- QD.
LOCALITY	The project site lies within ward 3 of Kgetlengrivier Local Municipality which is under Bojanala Platinum District Municipality. The proposed mining operations are located approximately 36 km west from the town of Rustenburg and 24 km north of Koster, within the Magisterial District of Rustenburg in the North West Province. Immediate residential areas include

ITEM	DETAILS
	Swartruggens, Borolelo, Dithabeneng, Tlhabane, Protea Park and Rustenburg.
EXTENT OF THE APPLICATION REQUIRED FOR MINING	Approximately 108.073400 hectares
EXTENT OF THE AREA REQUIRED FOR INFRASTRUCTURE, ROADS, SERVITUDES, ETC	Approximately 1.7 hectares
DEPTH OF THE MINERAL BELOW SURFACE	Approximately 15 m below ground surface
LIFE OF MINE	±30 years
GEOLOGICAL FORMATION	Daspoort Geological Formation (Pretoria Group)

1.6 PROPERTY DESCRIPTION

The proposed Trizafield Woodstock Sand Mine is located portion 19 of the farm Woodstock 397 JP. The property is privately owned. No record of land claims has been made on this property at this stage. The property deed enquiry documents are attached as Annexure B.

Table 1-3: Property Details

Property Name	Property Number	Registration Division	Property Portion	21-SG Code	Property Owner
Woodstock	397	JP	Portion 19	T0JP00000000039700019	Johannes Jacobus Christiaan Buitendag

1.7 PROJECT LOCALITY

The proposed project area lies on the north-eastern parts of the North West Province within the Magisterial District Rustenburg. The North West Province is bounded by Botswana to the north and north-west, Limpopo Province to the north-east, Gauteng Province to the east, Free State Province to the south-east and Northern Cape Province on the south-western border. The project site lies within ward 3 of Kgetlengrivier Local Municipality which is under Bojanala Platinum District Municipality.

The proposed mining operations are located approximately 36 km west from the town of Rustenburg and 24 km north of Koster, within the Magisterial District of Rustenburg in the North West Province. Immediate residential areas include Swartruggens, Borolelo, Dithabeneng, Tlhabane, Protea Park and Rustenburg. The project covers an area of about 109.773400 hectares (ha) in extent and lies at geographical coordinates -25.626500° south and -26.909700° east. Access to the site is via a gravel road connected to the N4 national road. The N4 national road straddles (intersect) portion 19 of the farm Woodstock 397 JP.

Furthermore, the study area falls within A22D Quaternary Catchment (Dwarsspruit Catchment) of the Crocodile (West) and Marico water management area.

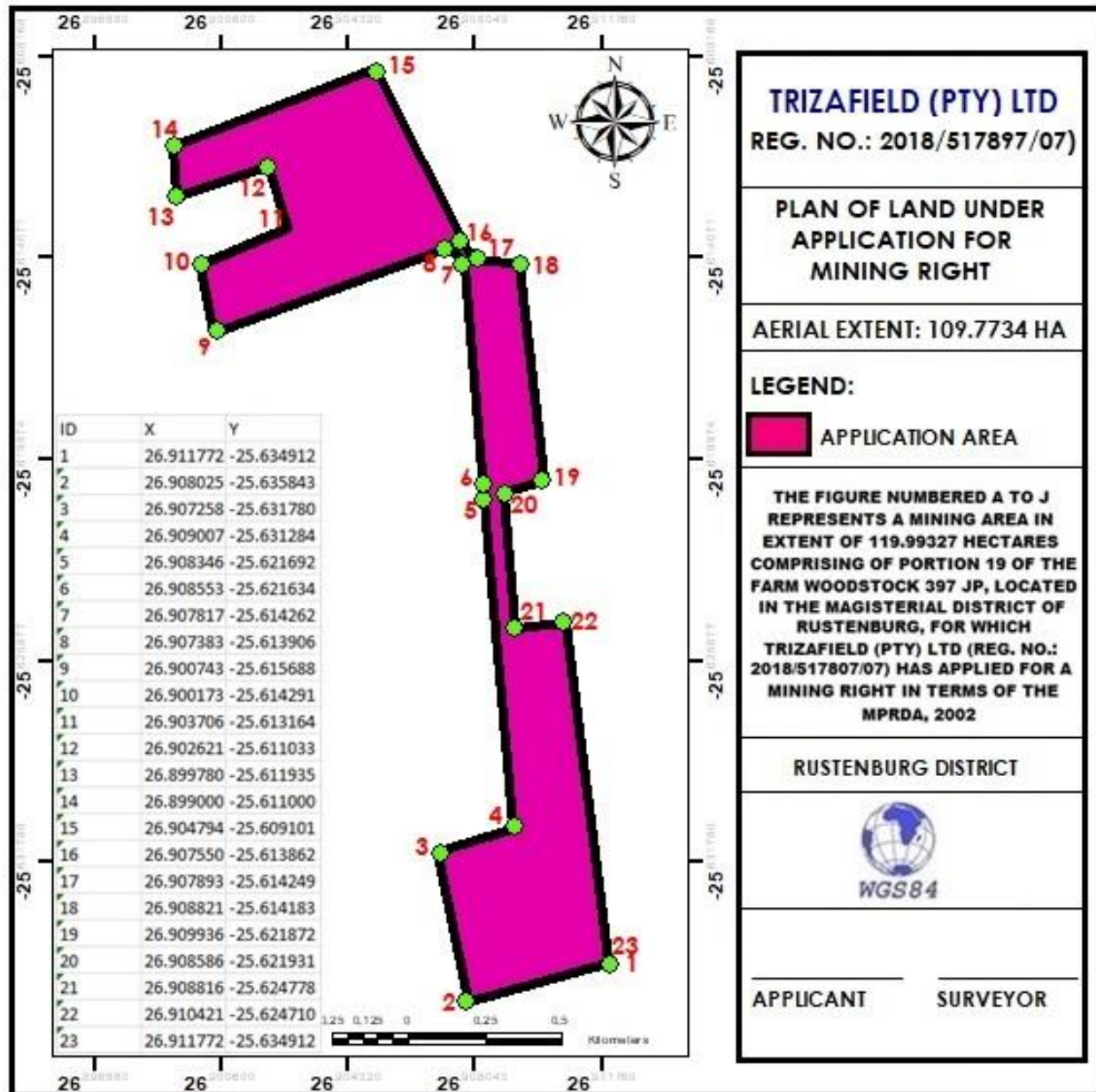
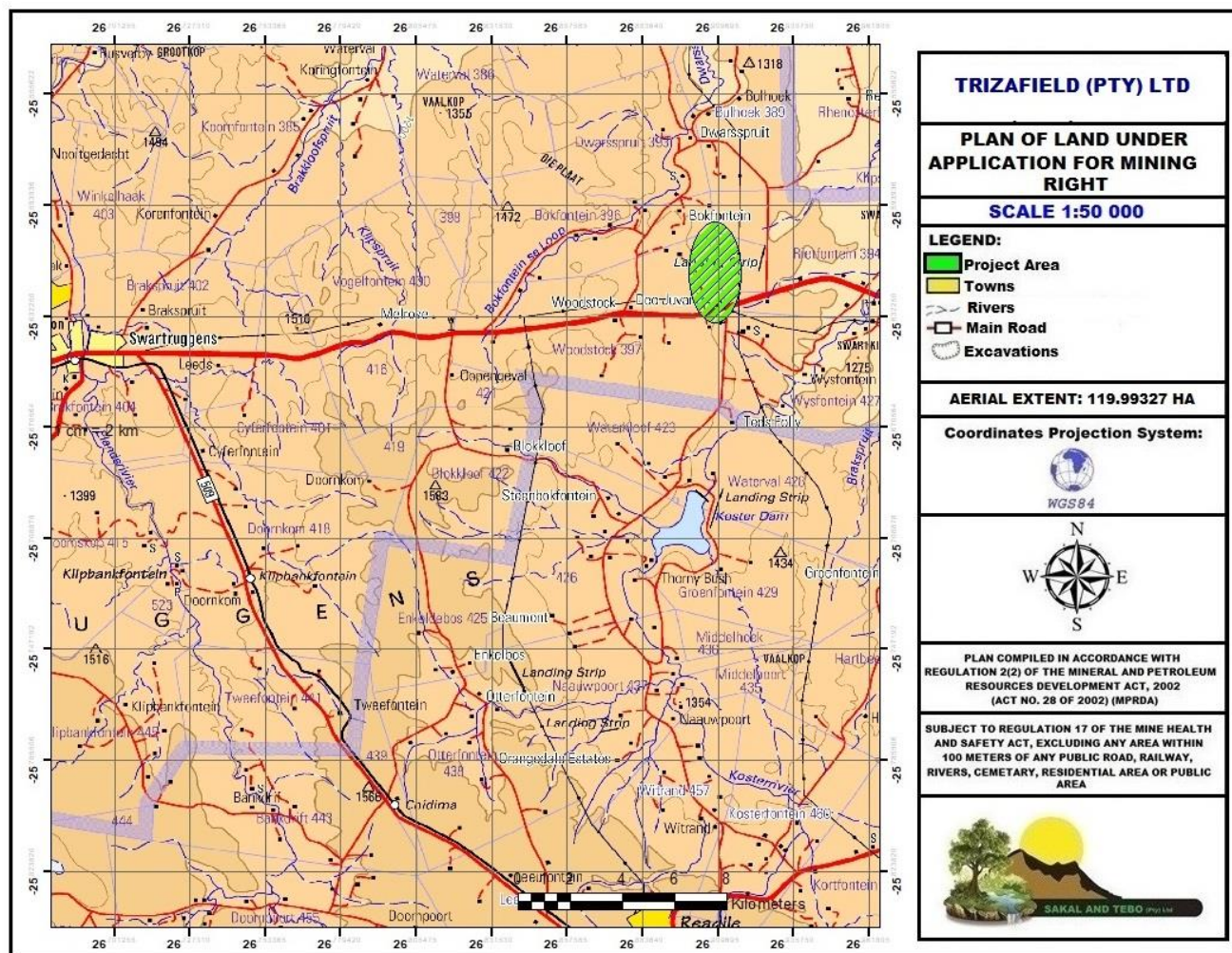


Figure 2-1: Regulation 2(2) Plan of the Study Area



1.8 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

i) Listed and specified activities

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 983, 984, 985	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Activity 11 The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; (ii) Inside urban areas or industrial complexes with a capacity of 275 kilovolts or more. Relevance: A power feeder will be obtained by establishing a connection to the sub station	1,7 ha	X	GNR 327 Listing Notice 1 (April 2017)	N/A
Activity 9 The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;	3 km pipeline	X	GNR 327 Listing Notice 1 (April 2017)	N/A
Activity 12 The development of – (ii) channels exceeding 100 square metres in size (iv) dams where the dam including infrastructure and water surface area, exceeds 100 square meters in size (vi) bulk storm water outlet structures exceeding 100 square metres in size; (xii) Infrastructure or structures with a physical footprint of 100 square meters or more. Relevance: Pollution control dams, water channelling and	1,7 ha	X	GNR 327 Listing Notice 1 (April 2017)	N/A

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 983, 984, 985	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
evaporation ponds will be constructed.				
Activity 13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	1000 cubic metres	X	GNR 327 Listing Notice 1 (April 2017)	N/A
Activity 14 The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres	1,7 ha	X	GNR 327 Listing Notice 1 (April 2017)	N/A
Activity 15 The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan	109.773400 ha	X	GNR 325 Listing Notice 2 (April 2017)	N/A
Activity 17 Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource [,] ; or (b) [including activities for which an exemption has been issued in terms of	109.773400ha	X	GNR 325 Listing Notice 2 (April 2017)	N/A

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablution facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 983, 984, 985	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)] the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;				

2 PROJECT DESCRIPTION

2.1 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

Mining will be based on the following principles:

- Mining will take place by truck and shovel opencast mining method;
- Bench sets will be mined at approximately 40 m in length, with a width of 40 m and each cut will have a depth of 6 m;
- It is estimated that a mine cut measuring 40m x 40 m x 6m along a bench set will be mined in less than a month.
- The volume of material removed from each cut will be approximately 9 600 m³;
- Annual production will be about 120 000 tonnes of material;
- Mining will take place to a maximum depth of 15 m;
- No overburden stripping will be required. Only 50 mm of topsoil might be removed for each box-cut. However, some areas have no topsoil but only silica;
- Topsoil will be stockpiled for future rehabilitation purposes and or sold as sand;
- The processed material will be stockpiled in the product stockpile areas located close to the mine office complex.

2.2 ACTIVITY LIFE DESCRIPTION

The proposed Trizafield Woodstock Sand Mine Life of Mine (LoM) is estimated at 30 years. Construction is expected to commence in the first quarter (1st) of 2022, whilst the operational phase (production) is scheduled for the month of March 2022. Mining will commence in the northern part of portion 19 of the farm Woodstock 397 JP as per the mining schedule below.

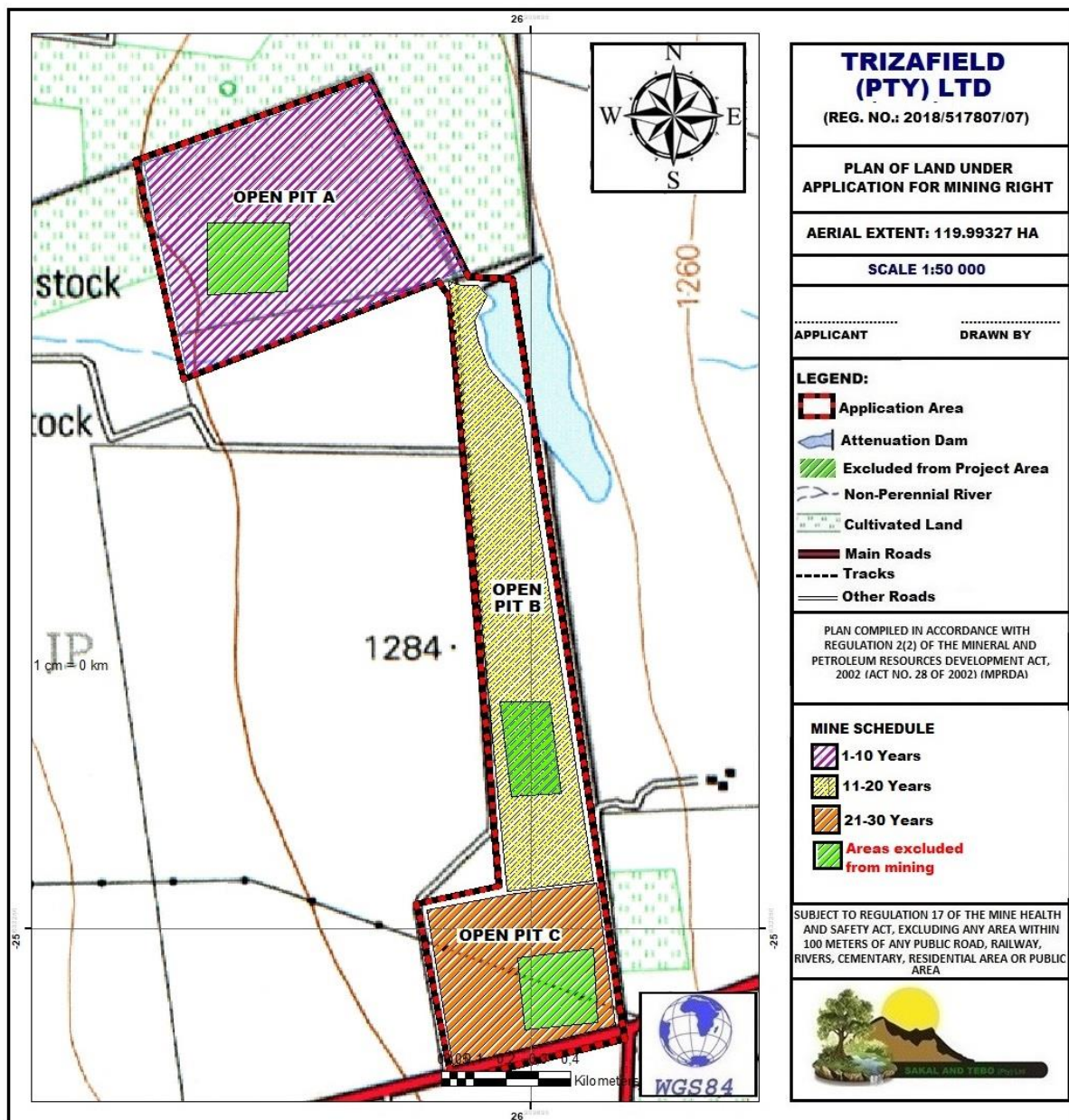


Figure 2-1: Proposed Mining Schedule

2.3 MINING METHOD

Silica (sand) will be mined through an opencast bench mining method. The benches will be mined at a width of 40 metres and a height of 6 metres. Final mining depth will be between 15 m below ground surface. Mining will commence in the northern part of the mining right application area and will progress in a south-easterly direction. Drilling of the rock face will be conducted on a predetermined schedule in accordance with projected volumes of production and will be undertaken by professionals and with the required safety procedures applied. The mining method will include:

- Clearance of the vegetation
- Stripping of topsoil to prepare box-cut area or bench
- The topsoil will be loaded onto dump trucks by excavators and hauled to areas that require rehabilitation or topsoil stockpile area;
- Drilling may occasionally not be required
- Drilling operations will commence in the front of the advancing pit after the topsoil has been removed;
- The removed Run of Mine (RoM) will be stockpiled using excavators; and
- Thereafter RoM will be transported to the washing plant by means of haul trucks with a loading capacity of approximately 40 tons.

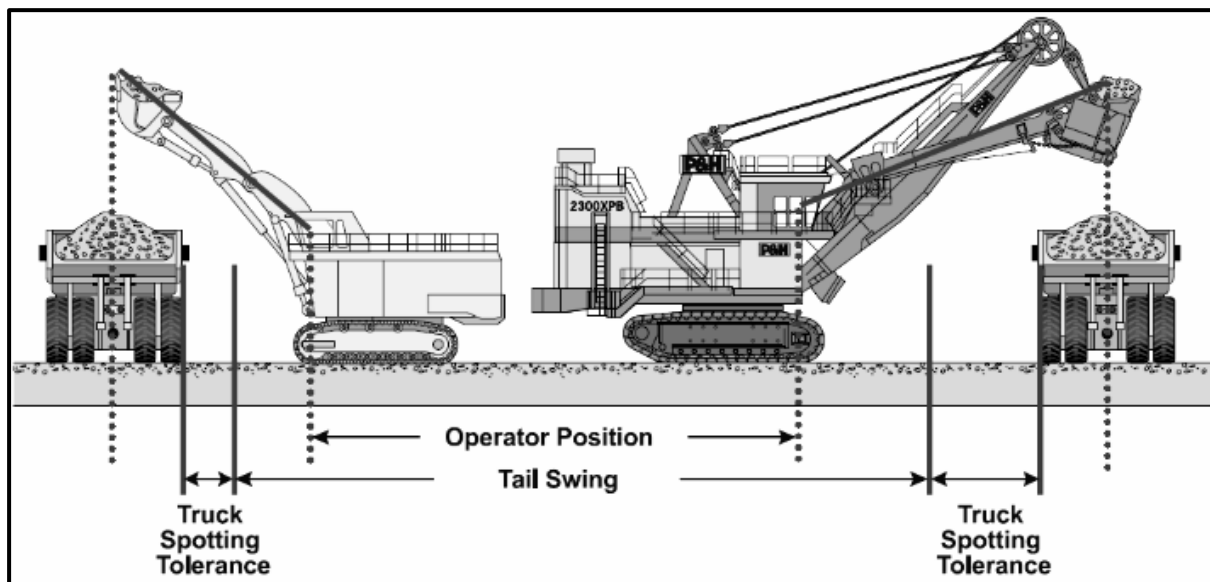


Figure 2-2: Truck and Shovel Mining Method

(https://www.researchgate.net/publication/303894688_Truck_and_Shovel_Versus_In-Pit_Conveyor_Systems_a_Comparison_Of_The_Valuable_Operating_Time)

2.4 PROCESSING PLANT FACILITY

2.4.1 CRUSHING

RoM is fed to the crushing plant by tipping it into a feed chute feeding a grizzly screen which screens the RoM before the oversize material is crushed. The crushed RoM is fed via conveyor to a screen with the upper and lower decks consisting of larger and smaller screening panels respectively. The oversize material from the upper deck is fed with a

conveyor to a jaw crusher which crushes the material to the desired size. Sand product is stockpiled (undersize) while the oversize together with a recycle stream and the crushed product is discharged into a chute. The final crushing plant screen consists of varying screening panels to yield different grades of material which are used as feed stocks for the various wash plant products. The -20 mm particles are screened out in the front of the screen while the undersize is collected at the rear of the screen. The oversize material of is fed to a Gyro crusher with conveyor and the crushed product (100% passing 40nmm) is recycled for washing. The material is drawn from underneath the -5 mm stockpile by a tunnel conveyor that feeds the wash plant.

2.4.2 SCREENING PROCESS

A vibratory feeder feeds the feedstock onto conveyor which discharges the material onto a grizzly screen which cuts at the desired size. The material from the grizzly screen is wet screened on the main screen. The oversize from the first screen is discharged onto the dewatering screen containing a mixture of screening panels (arranged in increasing aperture size in the direction of flow). The oversize material from the second screen is fed to a vertical shaft impactor from where the material crushed to -5 mm which is recycled and recombined with the raw feed.

The slurries collected underneath the first screen and the front section of the dewatering screen gravitates into a pot in which slimes overflow to the thickener pot and the underflow is pumped, dewatered and stacked with a separator on the product stockpile. The overflow from the separator returns to the pot below the screens.

The material collected in the collection pan at the rear section of the dewatering screen gravitates into another pot in which slimes are removed in the overflow to the thickener pot and the underflow is pumped to a separator, dewatered and stacked onto the Filter Product stockpile. Finally, the overflow from this separator returns to a pot.

All the overflows from the various pots in the screening and hydro-sizing plants combine into a pot from where it is pumped to the thickener.

2.4.3 SCREENING WITH HYDRO-SIZING PROCESS

Feedstock is fed onto a conveyor with a vibratory feeder that combines with the recycled oversize material from screen the dewatering float glass screen onto a single conveyor. This feeds the vertical side impactor (VSI) that crushes the -40 mm feed to 100% passing 5 mm. The crushed material from the VSI is fed onto the main screen consisting of only 1 mm screening panels and the oversize from the screen is discharged onto the dewatering screen which consists of 1mm panels in the front and 4 rows of panels with 5mm apertures at the rear section of the screen.

The material screened out in the main and dewatering screens is collected and together both are discharged into a pot. From this pot it is pumped to a dewatering cyclone where the solids are dewatered in preparation of further washing. The cyclone overflow is returned to the pot under the main screen and the overflow from this pot is gravity fed to the pot that goes to the thickener.

The cyclone underflow comprises the feed to the primary classifier where the D50 cut size of 665µm is achieved by an upward flow of water. The underflow of the cyclone gravity feeds to a pot from where the underflow is dewatered with a separator and stacked as filter product. The overflow of the separator is returned to another pot and the overflow from this pot gravitates to the thickener pot.

The overflow from the first classifier gravitates into a secondary classifier of which the D50 cut size is 75µm. The underflow of this classifier is fed into a pot from where the underflow is pumped to and dewatered with a separator and stacked as the final product. The overflow of the separator is returned to a pot and the overflow from the pot gravitates to the thickener return pot. Finally, the overflow from the secondary classifier flows into a pot, the underflow of which is pumped to a dedicated separator, dewatered and stacked onto the chemical sand product stockpile. The separator's overflow is returned to the pot and the overflow from this pot feeds into the thickener pot by gravity.

2.4.4 DRIER PLANT

After being dried in the respective stockpiles to a moisture content of 5% amber and float glass filter products are fed with a tunnel conveyor into a silo from which it is fed to driers with vibratory feeders.

The energy required to dry the material to a desired moisture content of less than 1% is obtained by combusting a heavy hydrocarbon fuel blend. The combusted fuel (flue gas) heats the filter sand thereby evaporating the moisture associated with the sand. Flue gas exits the drier and entrained dust is removed in a dust suppression system before the gas is discharged into the atmosphere. The dried filter product is discharged from the drier onto conveyors and is stockpiled in the dry sand shed before being sized in the screening plant according to product specifications.

Material that is not fed through the driers is placed on drying beds adjacent to the plant. Water runoff from the drying beds are collected in a sump and channelled to the process water dam located to the south-west of the plant for re-using in the plant. The dried filter sand is fed by means of conveyor to the dry screening plant where it is sized into fractions by means of vibratory screens in accordance with product specifications.

2.5 MINERAL RESOURCES STATEMENT

Trizafield Woodstock Sand Mine will involve mining of Concrete sand (Silica)- QO, Building sand (Silica)- QB, Crusher sand (Silica)- QC, Filling sand (Silica) QL, Foundry sand (Silica)- QF, Glass sand (Silica)- QG, Sand (General)- QY, Silica sand- QD mineral deposits contained within the Daspoort Geological Formation.

Mining will commence with the removal of the first 50 mm of topsoil using an excavator and front-end loader. The topsoil from the first block will then be stored in a topsoil berm on the mining area. Due to the rich source of seeds contained in the topsoil, vegetation will usually establish naturally. However, if self-establishment does not occur, the topsoil stockpile will be seeded to ensure the effective management of topsoil. Mining will involve the use of mechanised earth moving equipment (excavator and front-end loader also known as

“truck and shovel”) to move the unconsolidated material in bulk. Mining will continue to a depth of approximately 15 m.

The sand will be mined, stockpiled and sold to road construction companies, glass manufacturing companies, and building companies. The mining process will only require 10 full time workers on site, and 2 – 4 drivers transporting mined sand from the site to clients. Trucks (heavy vehicles) will be used to transport the sand from site to clients (buyers) and only 6 trucks will transport sand from site. The excavator and front-end loader that will be used on site will be stored in a small workshop to be developed on site. Only support equipment and infrastructure required to conduct mining will be on site.

Table 2-1: Estimated Mineral Resources

Depth of Mineral Resources	Project Area (footprint)	GTIS (tonnes)	Geological Loss (%)	MTIS
±15 mbgl	109.773400 Ha	4 140 000,00	15,00	3 600 000,00
GTIS = Gross Tonnes In Situ (estimated)		MTIS = Mineable Tonnes In Situ		

Trizafield Woodstock Sand Mine comprises 3.6 Million tons of silica sand material in the estimated mineable resources category. The proposed mining operation involves mining of silica (general sand) occurring in the Daspoort geological formation using conventional truck and shovel opencast mining method, with Run of Mine (RoM) processed in a crushing and screening unit plant. The Life of Mine (LoM) is estimated at ten (30) years with production at 120 000 tonnes per annum.

2.6 PRODUCTS TO BE PRODUCED

The main reason for this particular Mining Right application is for the supply of silica sand to various markets including the foundry and filtration industries in the North West, Free State, Gauteng and Mpumalanga regions. In conjunction with this many other local industries rely on various grades of silica sand to manufacture their products. The main products that are envisaged to be sold are Sand (general similar to River Sand), Chemical Sand and Filter Sand. Roughly 60% of the products will be distributed within the region (North West Province) while the remaining 40% is destined for the remainder of South Africa and surrounding African countries. The main industries that make use of the products are as follow:

Table 2-2: List of products to be produced

Product	Industry
General Sand	Construction and road works
Chemical sand	Sodium silicate
Filter sand	Water purification

Based on the current market structure approximately 70% of the mined material would be supplied to the construction (building) industry, other silica sand users are:

- Silica Distributors
- Adhesive Manufacturers
- Metal Foundries
- Golf Course Maintenance
- Building Maintenance
- Coatings and Adhesives Producers

2.7 ACTIVITY INFRASTRUCTURE REQUIREMENT

Infrastructure for mining and related operations at the proposed Trizafield Woodstock Sand Mine will include the following:

- Processing plant (wash plant);
- Run of Mine (RoM) stockpiles;
- Mobile office complex;
- Process water reservoir/tank/dam;
- Portable water tank (Jojo Tanks);
- Ablution facility;
- Store house;
- Workshop;
- 1x 20 tTonne Komatsu Excavator (or similar);
- 1x 20 Tonne Komatsu Front End Loader (or similar);
- 2x 18 m³ Tipper Truck;
- 1x 12 000 litre Water Bowser for dust suppression;
- Weigh-bridge;
- Security gate (boom gate) and fence (five strand barbed wire or Clear-Vu fence).

Access Roads

Existing access road will be used on site. No new roads (haul) will be developed on site. Access to the site is via a gravel road connected to the N4 national road. The N4 national road straddles (intersect) portion 19 of the farm Woodstock 397 JP.

Security and Access Control

A permanent security house and boom gates will be constructed at the mine entrance. The structures will comprise of brick and mortar and will be supplied with electricity from a diesel driven generator.

Process Water Supply

Process water supply will be sourced from the farm dam located on portion 19 of the farm Woodstock 397 JP (alternatives will include developing new groundwater abstraction boreholes on site). The water will be stored in a reservoir with a gross storage capacity of approximately 800 m³ to allow for no less than seven (7) days retention. The water requirement is for activities including those listed below, with more than 15 % of the total demand estimated for losses:

- Hydro-sizing processing plant (washing plant): **100 m³/day**
- Dust suppression: **40 m³/day**
- Human consumption, ablution and house-keeping: **60 m³/day**

A water purification system will be installed for the raw water component required for human consumption.

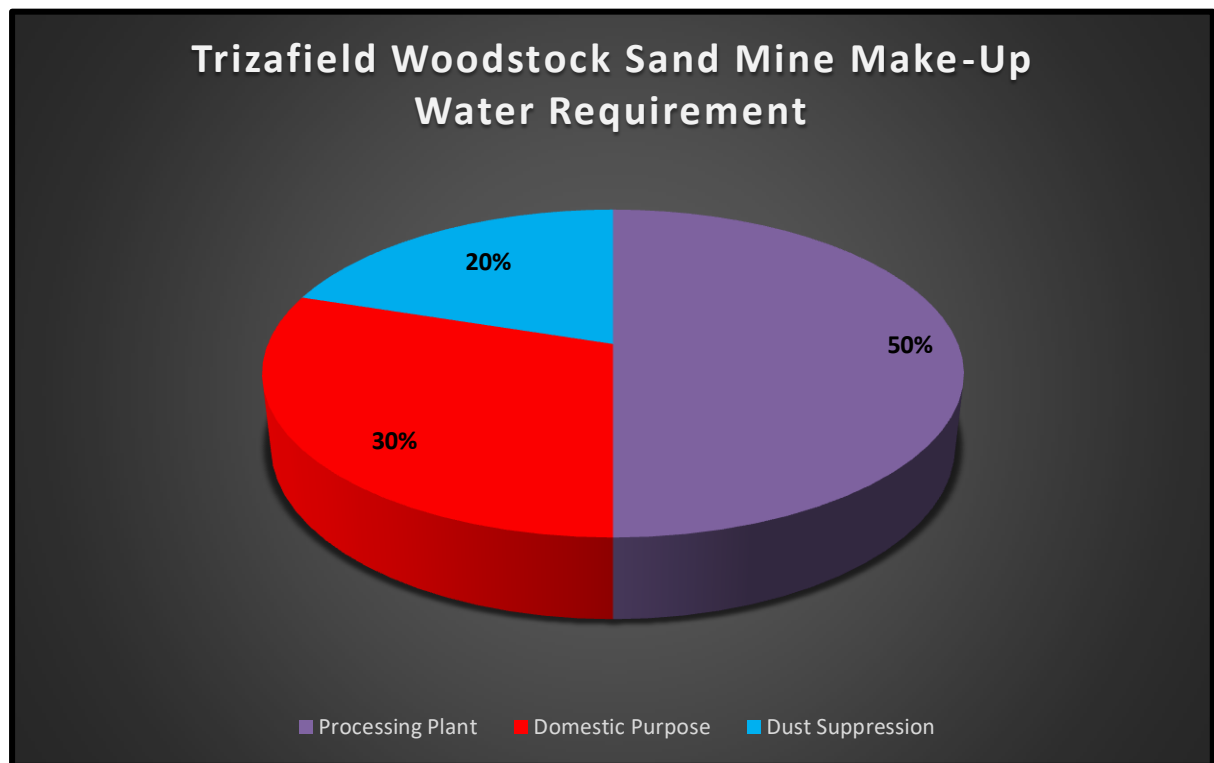


Figure 2-3: Trizafield Woodstock Sand Mine Estimated Water Requirement

Potable Water Supply

Potable water required for the proposed mining operation is approximately 100 litres per day (ℓ/day). The water will be used for drinking purposes and will be sourced from local water vendors within Rustenburg and nearby areas such as Swartruggens. The water will be supplied in cooled water dispensers.

Ablution

Waterborne sanitation will be in place for ablution facilities at the mine office, change house, and workshop area, to be located portion 19 of the farm Woodstock 397 JP. An internal sewage reticulation system will be provided to drain all raw sewage and grey water from the mine office complex and workshops. The sewage will be treated in a package sewage treatment plant with a design capacity of approximately 65.15 m³. The treated sewage effluent will be drained to the PCD for reuse in the processing plant and for dust suppression. The system will employ an activated sludge process and disinfection to General Effluent Standards.

In addition, portable chemical toilets will be provided at the underground workings. The raw sewage will be collected by an authorized contractor for disposal into an authorized sewage treatment works. Safe Disposal Certificates will be kept in record at the mine.

Mine Office Complex

Mine office complex will be established on site and will include the following:

- Vehicles and equipment area
- Ablution facility (chemical mobile toilet)
- Mobile office (mobile container)

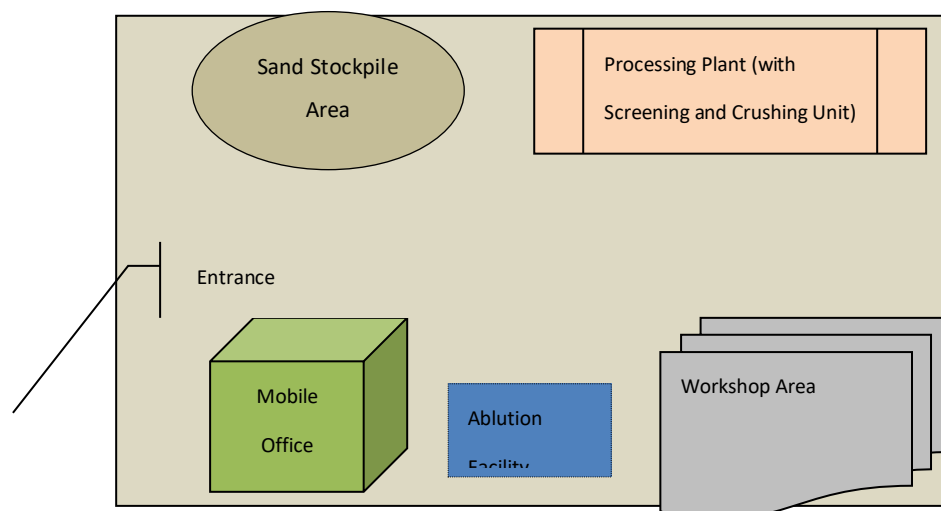


Figure 2-4: Proposed site layout plan for mine office complex and processing facility

Accommodation

No accommodation for workers will be provided on site. Employment will be sourced from Rustenburg and Swartruggens.

Blasting

No blasting will take place on site.

Operational Phase

- Given the soil profile of the land, the topsoil layer is about 50 mm thick.
- The target stone and sand material will be mined in a box cut method to ensure systematic mining in linear progression to allow for practical concurrent rehabilitation. The box cuts will be developed in phases of 40 m x 40 m each to ensure systematic

progression. An excavator will be used to break hard matter and load it into a tipper truck.

- Mined material will be loaded into tipper trucks directly from the excavations and hauled to the screening (sieving) plant, where the material will be screened into different mesh sizes as per customer requirement.
- Material will be screen into the correct mesh size and then loaded into trucks and transported to the market (buyers).
- No industrial or mine waste is generated during the mining process. All material consisting mainly of silica (sand) is removed from the box-cut.
- The depth of the mining operations will be an average depth of ± 15 metres as only the top layer of sand is mined. The total area under excavation will be approximately 109.773400 ha and sand will be removed over the total area. Backfilling is not an option as the sand is completely removed.
- Only minor repairs are done on site. A PVC lining and drip trays are used during maintenance and accidental spills are cleaned up immediately by removing of the contaminated sand. The small volume of contaminated sand is sold with the rest of the sand.

Hydrocarbon Storage

During mining on site, limited quantities of diesel fuel, oil, and lubricants will be stored on site. Diesel fuel will be stored in significant quantities in above ground diesel storage tanks with a gross storage capacity of approximately 40 m³. In the event of a significant hydrocarbon spill, the following procedure is required:

- The source of the spillage shall be isolated
- The spillage must be contained using sand berms, sandbags, pre-made booms, saw dust or absorbent materials.
- The area shall be cordoned off, secured and made safe.
- The incident will be recorded and reported to the Department of Mineral Resources (DMR), Department of Economic Development, Tourism and Environmental Affairs, and Department of Environmental Affairs (DEA) as well as property owners.

- Depending on the nature of and extent of the spill, contaminated soil will be removed and disposed of in a waste deposit receptacle for final disposal at a licensed hazardous landfill site.
- Where relevant, the polluted soil will be treated using absorbent material as well as oil-digestive powders.
- If necessary, oil absorbent sheeting or pads or similar alternatives will be attached to leaky machinery or equipment.
- Material used for the remediation of petrochemical spills must be used according to the product specification and guidance for use.
- Contaminated remediation materials will be carefully removed from the area of the spill so as to prevent further release of hazardous substance to the environment, and stored in adequate containers until appropriate disposal.

Decommissioning and Closure Phase

Planning for closure and restoration from the beginning of an operation makes the process more efficient:

- Waste will be removed as it is created,
- Excavation will be planned so that topography restoration is less complicated, and
- Topsoil can be re-used at shorter interval.
- Site rehabilitation will ensure that the land more valuable and attractive for resale.
- Concurrent rehabilitation will commence with the completion of each box. The material salvaged out of screening (discard) will be used as backfill. Rehabilitation of the site will be done in accordance with a rehabilitation plan

3 POLICY AND LEGISLATIVE CONTEXT

3.1 THE SOUTH AFRICAN CONSTITUTION

This section provides an overview of the legislative requirements applicable to this project and it includes the Acts, guidelines and policies considered in the compilation of this report. The legislative motivation for this project is underpinned by the Constitution of South Africa, 1996 (Act No. 108 of 1996), which states that:

The State must, in compliance with Section 7(2) of the Constitution, respect, protect, promote and fulfil the rights enshrined in the Bill of Rights, which is the cornerstone of democracy in South Africa. Section 24 of the Constitution:

24. Environment

-Everyone has the right-

- (a) to an environment that is not harmful to their health or well-being; and*
- (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-*
 - (i) prevent pollution and ecological degradation;*
 - (ii) promote conservation; and*
 - (iii) secure ecologically sustainable development and use of natural resources while promoting a justifiable economic and social development.*

Section 24 of the Constitution of South Africa (Act No. 108 of 1996) requires that all activities that may significantly affect the environment and require authorisation by law must be assessed prior to approval. In addition, it provides for the Minister of Environmental Affairs or the relevant provincial Ministers to identify:

- new activities that require approval;
- areas within which activities require approval; and
- existing activities that should be assessed and reported on.

Section 28(1) of the Constitution of South Africa (Act No. 108 of 1996) states that: “every person who causes, has caused or may cause significant pollution or degradation of the

environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring". If such pollution or degradation cannot be prevented then appropriate measures must be taken to minimise or rectify such pollution or degradation. These measures may include:

- Assessing the impact on the environment;
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks;
- Ceasing, modifying or controlling actions which cause pollution/degradation;
- Containing pollutants or preventing movement of pollutants;
- Eliminating the source of pollution or degradation; and
- Remedying the effects of the pollution or degradation.

Applicability: Public participation process and consultation will be done at every stage of the EIA phase. The public participation process to be followed and consultations to be done regarding the proposed project. An EMP and awareness plan will be designed according to the issues raised during this process.

3.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The NEMA Act under sections 24(2), 24(5), 24D and 44, read with section 47A (1) (b) of National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2017 (as amended), is regarded as one of the important pieces of general environmental legislation as it provides a framework for environmental law reform. The main objective of this act is to ensure that ecosystem services and biodiversity are protected and maintained for sustainable development. Furthermore, Section 28 (1) of the NEMA requires that "every person who causes has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring".

NEMA strives to regulate national environmental management policy and is focussed primarily on co-operative governance, public participation and sustainable development. NEMA makes provisions for co-operative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that will

promote co-operative governance and procedures for co-ordinating environmental functions exercised by Organs of State and to provide for matters connected therewith.

A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include-

(a) details of-

- I. the EAP who prepared the report; and*
- II. the expertise of the EAP, including a curriculum vitae; (See Annexure 1)*

(b) the location of the activity, including-

- I. the 21-digit Surveyor General code of each cadastral land parcel;*
- II. where available, the physical address and farm name;*
- III. where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;*

(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-

- I. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or*
- II. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;*

(d) a description of the scope of the proposed activity, including-

- I. all listed and specified activities triggered;*
- II. a description of the activities to be undertaken, including associated structures and infrastructure;*

(e) 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;

(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;

(h) a full description of the process followed to reach the proposed preferred activity, site and location within the site, including-

- I. details of all the alternatives considered;
- II. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;
- III. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- IV. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- V. the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-
 - a) can be reversed;
 - b) may cause irreplaceable loss of resources; and
 - c) can be avoided, managed or mitigated;
- VI. the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;
- VII. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community, that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- VIII. the possible mitigation measures that could be applied and level of residual risk;
- IX. the outcome of the site selection matrix;
- X. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and
- XI. a concluding statement indicating the preferred alternatives, including preferred location of the activity;

Applicability: Baseline environmental information of the project area will be assessed. Mitigation measures and recommendations where provided according to best practice standards. This scoping report complies with the requirements of the NEMA act.

3.3 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT

The MPRDA makes provision, for persons to apply for a mining right. A mining right granted in terms of the MPRDA is a limited real right in respect of the type of resources and the land to which the right relates. The holder of a mining right is entitled to the rights referred to in the MPRDA or any other law.

The applicant requires a mining right and environmental authorisation from the DMR. Acceptance of the Mining Right application by DMR makes provision for the applicant to continue with the necessary process and does not constitute authorisation. The acceptance details the outstanding requirements for the application, which includes:

- (a) the submission of an EMP; and
- (b) notification and consultation with IAPs, including land owners or lawful occupiers of land, on which the proposed mining is to be conducted;
- (c) Details on how the applicant will substantially and meaningfully expand opportunities for historically disadvantaged persons.

Applicability: A mining right was lodged with the DMRE.

3.4 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT 10 OF 2004)

The overarching aim of the National Environmental Management: Biodiversity Act, 2004 (NEMBA), within the framework of NEMA, is to provide for:

- *The management and conservation of biological diversity within South Africa as well as for the components of such biological diversity;*
- *The use of indigenous biological resources in a sustainable manner and*
- *The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources.*

As part of its implementation strategy of NEMBA, the National Spatial Biodiversity Assessment was developed. This assessment classifies areas as worthy of protection based on its

biophysical characteristics, which are ranked according to priority levels. The approach used for biodiversity planning is systematic and entails the following three key principles:

- *The need to conserve a representative sample of biodiversity pattern, such as species and habitats (the principle of representation);*
- *The need to conserve the ecological and evolutionary processes that allow biodiversity to persist over time (the principle of persistence); and*
- *The need to set quantitative biodiversity targets that quantifies the degree of conservation required for each biodiversity feature in order to maintain functioning landscapes and seascapes.*

Furthermore, the South African National Biodiversity Institute (SANBI) was established by the NEMBA, its purpose being (*inter alia*) to report on the status of the country's biodiversity and the conservation status of all listed threatened or protected species and ecosystems. NEMBA provides for a range of measures to protect ecosystems and for the protection of species that are threatened or in need of protection to ensure their survival in the wild, including a prohibition on carrying out a "restricted activity" involving a specimen of a listed threatened or protected species without a permit issued in terms of Chapter 8 of the Act. Lists of critically endangered, endangered, vulnerable and protected species have been published and a permit system for listed species has been established.

The Applicant is therefore required to take appropriate reasonable measures to limit the impacts on biodiversity, to obtain permits if required.

Applicability: An Ecological (Fauna and Flora) Impact Assessment is undertaken for developments in an area that is considered ecologically sensitive and which requires environmental authorisation in terms of NEMA, with such assessment taking place during the Scoping or EIA phase.

3.5 NATIONAL FOREST ACT, 1998 (ACT 84 OF 1998)

The purposes of National Forest Act, 1998 (act 84 of 1998) (NFA) includes *inter alia*:

- (c) *provide special measures for the protection of certain forests and trees:*

(d) promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.

Applicability: A flora and fauna study will be conducted to determine the tree species in the project area and specify if there are any endangered species. A permit for the removal / destruction of protected trees will be applied for with the relevant Agriculture and F in terms of Section 15 of the forestry department NFA.

3.6 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT (ACT NO 39 OF 2004)

Section 28 (1) of NEMA places a general duty of care on any person who causes pollution, to take reasonable measures to prevent such pollution from occurring. The objective of the National Environmental Management: Air Quality Act, 2004 (NEM:AQA) is to regulate air quality in order to protect, restore and enhance the quality of air in the Republic, taking into account the need for sustainable development. Furthermore, the provision of national norms and standards regulating air quality monitoring, management and the control by all spheres of government determine that specific air quality measures should be adhered to. Dust created during the construction and operational phases of the proposed Trizafield Woodstock Sand Mine could influence air quality and thus make this legislation relevant to this development. Air quality management and mitigation measures during the mining phase will be considered to be a measure to exercise this duty of care, since it aims to minimise volumes of dust emissions emanating from the operational activities.

Applicability: An air emission license will be required for the processing plant and air quality monitoring will be implemented at the mine.

3.7 CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT 43 OF 1983)

The aim of the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983) (CARA) is to provide for control over the utilisation of the natural agricultural resources of the Republic in

order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants and for matters connected therewith. The EIA phase of the project will take into account the requirements of CARA as well as determine the potential direct and indirect impacts on agricultural resources as a result of the proposed mining development.

Applicability: A soil and land capability impact assessment will be undertaken.

3.8 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT (ACT 59 OF 2008)

The National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) and Waste Classification and Management Regulations, 2003 (GNR: 634 – 635): To reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development; to provide for institutional arrangements and planning matters; to provide for national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

The operational activities associated with the proposed mining program shall be in accordance with the requirements of National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEM:WA) and Waste Classification and Management Regulations, 2003 (GNR: 634 – 635).

THE KEY WASTE STREAMS

According to this Mining Works Programme (MWP), the following waste streams will be generated at the Trizafield Woodstock Sand Mine:

- General domestic waste (e.g. food waste, papers, plastics, glass, cans, garden waste, etc.);

- Sewage and sullage from the office, change house and workshop;
- Waste rock;
- Spent oil and grease from mine workshops, as well as hydrocarbon containers;
- Fluorescent tubes, old batteries, waste paints;
- Scrap waste (scrap metals, empty chemical containers, and metal off-cuts);
- Wood waste (packaging material);

3.9 OCCUPATIONAL HEALTH AND SAFETY ACT (ACT 85 OF 1993)

The aim of the Occupational Health and Safety Act, 1993 (act 85 of 1993) (OHSA) is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery ; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work; to establish an advisory council for occupational health and safety as well as to provide for matters connected therewith.

Section 8 which deals with the general duties of employers and their employees states that:

- 1) *"Every employer shall provide and maintain, as far as is reasonably practicable, a working environment that is safe and without risk to the health of the employees."*
- 2) *"Without derogating from the generality of an employer's duties under subsection (1), the matters to which those duties refer include in particular:*
 - a. *The provision and maintenance of systems of work, plant and machinery that, as far as reasonably practicable, are safe and without risk to health;*
 - b. *Taking such steps as may be reasonably practicable to eliminate or mitigate any hazard or potential hazard to the safety and health of employees;*
 - c. *Making arrangement for ensuring as far as reasonably practicable, the safety and absence of risks to health in connection with the production, processing, use, handling, storage and transport of articles or substances;*
 - d. *Establishing, as far as reasonably practicable, what hazards to the health or safety of persons are attached to any work which is performed, any article or substance which is produced, processed, used, handled, stored or transported and any plant or machinery which is used in his business, and he shall, as far as reasonably practicable, further establish what precautionary measures should be taken with*

respect to such work, article, substance, plant or machinery in order to protect the health and safety of persons, and he shall provide the necessary means to apply such precautionary measures;

- e. Providing such information, instruction, training and supervision as may be necessary to ensure, as far as reasonably practicable, the health and safety of employees;*
- f. As far as reasonably practicable, not permitting any employee to do any work or to produce, process, use, handle, store, or transport any article or substance or to operate any plant or machinery, unless precautionary measures contemplated in paragraph (b) and (d), or any precautionary measures which may be prescribed, have been taken;*
- g. Taking all necessary measures to ensure that the requirements of this act are complied with by every person in his employment or on the premises under his control where plant and machinery is used;*
- h. Enforcing such measures as may be necessary in the interest of health and safety;*
- i. Ensuring that work is performed and that plant and machinery is used under the general supervision of a person trained to understand the hazards associated with it and who has the authority to ensure that precautionary measures taken by the employer are implemented and*
- j. Causing any employees to be informed regarding the scope of their authority as contemplated in section 37(1)(b).''*

3.10 NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO. 25 OF 1999)

The Trizafield Woodstock Sand Mine must comply with the requirements stipulated in the National Heritage Resources Act, 1999 (Act 25 of 1998) (NHRA). The NHRA legislates the necessity for cultural and Heritage Impact Assessment (HIA) in areas earmarked for development, which exceed 0.5 ha or linear development exceeding 300 metres in length. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Section 38(1) of NHRA, subject to the provisions of subsections (7), (8) and (9), requires that any person who intends to undertake a development categorised as:

- (a) The construction of **a road**, wall, power line, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;*
- (b) The construction of a bridge or similar structure exceeding 50m in length;*
- (c) Any development or other activity which will change the character of a site-
 - (i) Exceeding 5 000 m² in extent; or*
 - (ii) Involving three or more existing erven or subdivisions thereof; or*
 - (iii) Involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) The costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;**
- (d) The re-zoning of a site exceeding 10 000 m² in extent; or*
- (e) Any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, 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.*

Archaeological impact assessments (AIAs) are often commissioned as part of the heritage component of an EIA and are required under Section 38(1) of the NHRA of 1999, Section 38(8) of the NEMA and the MPRDA.

The process of archaeological assessment usually takes the form of:

1. A scoping or initial pre-assessment phase where the archaeologist and developer's representative establish the scope of the project and terms of reference for the project;
2. A Phase 1 AIA;
3. A Phase 2 archaeological mitigation proposal; and
4. A Phase 3 heritage site management plan.

PHASE 1: ARCHAEOLOGICAL IMPACT ASSESSMENT

A Phase 1 AIA generally involves the identification and assessment of sites during a field survey of a portion of land that is going to be affected by a potentially destructive or landscape altering activity. The locations of the sites are recorded and the sites are described and characterised. The archaeologist assesses the significance of the sites and the potential impact of the development on the sites and makes recommendations. It is essential that the report supply the heritage authority with sufficient information about the sites to assess, with confidence, whether or not it has any objection to a development, indicate the conditions upon which such development might proceed and assess which sites require permits for destruction, which sites require mitigation and what measures should be put in place to protect sites that should be conserved.

Minimum standards for reports, site documentation and descriptions are clearly set out by the SAHRA and supported by the Association of Southern African Professional Archaeologists (ASAPA). The sustainable conservation of archaeological material (*in situ*) is always the best option for any sites that are deemed to be of importance. The report needs to indicate which sites these are, explain why they are significant and recommend management measures. In certain kinds of developments which involve massive intervention (mining, dam construction, etc.), it is not possible to reach a conservation solution other than to develop a programme of mitigation which is likely to involve the total or partial “rescue” of archaeological material and its indefinite storage in a place of safety.

PHASE 2: ARCHAEOLOGICAL MITIGATION PROPOSAL

If the Phase 1 report finds that certain archaeological sites in a development area are of low significance, it is possible to seek permission from the heritage authority for their destruction. The final decision is then taken by the heritage resources authority, which should give a permit or a formal letter of permission, or in the case of an EIA issue a comment allowing destruction.

Phase 2 archaeological projects are primarily based on salvage or mitigation excavations preceding development that will destroy or impact on a site. This may involve collecting of artefacts from the surface, excavation of representative samples of the artefact material to

allow characterisation of the site and the collection of suitable materials for dating the sites. The purpose is to obtain a general idea of the age, significance and meaning of the site that is to be lost and to store a sample that can be consulted at a later date for research purposes. Phase 2 excavations should be done under a permit issued by SAHRA, or other appropriate heritage agency, to the appointed archaeologist. Permit conditions are prescribed by SAHRA, or other appropriate heritage agencies. Conditions may include as minimum requirements reporting back strategies to SAHRA, or other appropriate heritage agencies and/or deposition of excavated material at an accredited repository.

Should further material be discovered during the course of development, this must be reported to the archaeologist or to the heritage resources authority and it may be necessary to give the archaeologist time to rescue and document the findings. In situations where the area is considered archaeologically sensitive the developer will be asked to have an archaeologist monitor earth-moving activities.

PHASE 3: MANAGEMENT PLAN FOR CONSERVATION AND PLANNING, SITE MUSEUMS AND DISPLAYS

On occasion Phase 2 may require a Phase 3 program involving one of the following:

- The modification of the site;
- The incorporation of the site into the development itself as a site museum;
- A special conservation area; or
- A display.

Alternatively, it is often possible to re-locate or plan the development in such a way as to conserve the archaeological site or any other special heritage significance the area may have. For example in a wilderness or open space areas where such sites are of public interest, the development of interpretative material is recommended since it adds value to the development. Permission for the development to proceed can be given only once the heritage resources authority is satisfied that measures are in place to ensure that the archaeological sites will not be damaged by the impact of the development or that they have been adequately recorded and sampled. Careful planning can minimise the impact of archaeological surveys on development projects by selecting options that cause the least amount of inconvenience and delay. The process as explained above allows the

rescue and preservation of information relating to our past heritage for future generations. It balances the requirements of developers and the conservation and protection of our cultural heritage as required of SAHRA and the provincial heritage resources authorities.

Applicability: A heritage assessment will be undertaken

3.11 NATIONAL WATER ACT, 1998 (ACT NO.36 OF 1998)

The National Water Act, 1998 (Act 36 of 1998) (NWA) aims to provide management of the national water resources to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected as well as integrated management of water resources with the delegation of powers to institutions at the regional or catchment level.

The purpose of the NWA is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways, which takes into account:

- Meeting the 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;
- Facilitating social and economic development;
- Providing for 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 and
- Managing floods and droughts.

Section 21 of the National Water Act, 1998 (No. 36 of 1998) (NWA) lists water uses for which a Water Use License (WUL) must be obtained. Uses with potential relevance to the proposed mining include:

Table 3-1: Summary of Key Water Uses

Section 21 Water Use	Activity Description	Operational Status
Section 21 (a) taking water from a water resource	Groundwater abstraction boreholes	Proposed
	Use of water from the farm dam	Proposed
Section 21 (b) storing water	Raw water reservoir	Proposed
	Potable water storage tank	Proposed
Section 21 (c) impeding or diverting the flow of water in a watercourse	Groundwater abstraction borehole located within 100 m from the farm dam	Proposed
Section 21 (g) disposing of waste in a manner which may detrimentally impact on a water resource	Package sewage treatment plant	Proposed
	Pollution control dam	Proposed
	Run of Mine (RoM) stockpiles	Proposed
	Waste rock stockpiles	Proposed
	Backfilling of the opencast mine workings	Proposed
	Dust suppression	Proposed
Section 21 (i) altering the bed, banks, course or characteristics of a watercourse	Groundwater abstraction borehole located within 100 m from the farm dam	Proposed

The Department of Water and Sanitation (DWS) has published various General Authorizations (GA) in terms of Section 39 of the NWA which, replace the need for a water user to apply for a license in terms of the NWA for specific activities. The GAs have been revised and amended at different times.

The GAs set out specific conditions under which a water use may occur without a license and also specify the conditions or thresholds at which a user must register the use with the DWS.

OTHER APPLICABLE NATIONAL LEGISLATIONS

- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- Roads Ordinance Amendment Act, 1998 (Act No. 17 of 1998);
- South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998);

3.12 PROVINCIAL LEGISLATIVE FRAMEWORK

Table 3-2: Provincial legislation, policies and guidelines considered

TITLE OF LEGISLATION, POLICY OR GUIDELINE	APPLICABILITY TO THIS PROJECT	ADMINISTERING AUTHORITY	DATE
DEA&DP and DEA Guidelines on Public Participation	Used as a guide to inform of the public participation process.	Department of Environmental Affairs and Development Planning Department of Environmental Affairs	2012 2014
DEA and DP and DEA Guidelines on Alternatives	Used as a guide to inform on the use and presentation of alternatives in the EIA process.	Department of Environmental Affairs and Development Planning Department of Environmental Affairs	2012
DEA and DP Guidelines on Need and Desirability	Used as a guide to inform on the need and desirability of the upgrade in conjunction with the above mentioned SDF's and IDP's.	Department of Environmental Affairs and Development Planning Department of Environmental Affairs	

3.13 APPLICABLE LEGISLATION AND APPROVALS REQUIRED

The proposed Trizafield Woodstock Sand Mine requires the following approvals before the project may commence:

- Mining right and Environmental authorization from DMRE in terms of the MPRDA (Act 28 of 2002) and National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2017;
- Approval of the Environmental Management Programme in terms of the Mineral and Petroleum Resources Development Act (No 28 of 2002) (MPRDA), by DMRE;

- A Water Use License in terms of section 21 of the National Water Act, 1998 (Act No. 36 of 1998)

In addition to the main legal approvals, the following approvals will be required:

- The South African Heritage Resources Agency needs to approve a Heritage Assessment Report, to be conducted as part of the overall EIA process, in terms of the National Heritage Resources Act (No 25 of 1999). Permits will be required for the destruction or removal of any heritage resources affected by the development.
- Should protected species be affected, permits will have to be obtained for their removal, relocation or destruction. This is in terms of the National Environmental Management: Biodiversity Act (No 10 of 2004).

Other applicable legislation includes:

- Conservation of Agricultural Resources Act (No 43 of 1983).
- Environment Conservation Act (No 73 of 1989).
- National Forests Act (No 84 of 1998).
- National Veld and Forest Fire Act (No 10 1998).

4 PROJECT ALTERNATIVES

According to the EIA Guideline and Information Document Series (2011) feasible and reasonable alternatives have to be identified for a development as required by the NEMA EIA Regulations and applicable to EIA. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. When no feasible and/or reasonable alternatives could be identified and investigated in terms of a comparative assessment during the Scoping phase, the EIAR will then not contain a section with alternative. Alternatives forms a vital part of the initial assessment process through the consideration of modifications in order to prevent and/or mitigate environmental impacts associated with a particular development. Alternatives are to be amended when the development's scope of work is amended. It is vital that original as well as amended alternative identification, investigation and assessment together with the generation and consideration of modifications and changes to the development and activities are documented.

The EIA Regulations (2017) defines alternatives as the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

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

Although an array of alternatives could be investigated for each project, such alternatives will not necessarily be applicable to each project and/or project phase. However there must always be strived to seek alternatives that maximises efficient and sustainable resource utilisation and minimise environmental impacts.

4.1 FEASIBLE ALTERNATIVES

4.1.1 LOCATION

No alternatives have been investigated in terms of location due to the geological formation of the area as well as the availability of resources as noted by the applicant. Numerous Mining Permit applications for sand have been granted on portion 19 of the farm Woodstock 397 JP which show of the availability of a deposit. The site was selected as it contains good quality sand located in a convenient position in close proximity to transport routes. The layout and technology of this sand mining project has been determined by the shape, position and orientation of the mineral resource. Refer to the Site Plan above. The operational approach is practical and based on best practice to ensure a phased approach of mining followed by rehabilitation in sequential stages.

- The preferred and only location of the sand mining activity is on the earmarked section of the application area- Portion 19 of the farm Woodstock 397 JP;
- The preferred and only activity is the mining of sand;
- The preferred and only technology is the use of a Front End Loader to remove the sand and for trucks to transport the sand to the clients (buyers).

There are therefore no other reasonable or feasible sites, layouts, activities, technologies, or operational alternatives for further consideration in the impact assessment component, other than the mandatory “no-go” alternative that must be assessed for comparison purposes as the environmental baseline.

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4.1.2 ACTIVITY

The proposed mining method for the operation is an opencast truck and shovel mining method. Mining will involve the use of mechanized earth moving equipment (an excavator and front-end loader) to move the unconsolidated material in bulk.

4.1.3 DESIGN

There are other possible layout design possibilities but the current design is the most efficient for this type of mining activity.

4.1.4 TECHNOLOGICAL

RECYCLING:

The mining project will in its operational phase implement recycling policies and measures for optimal utilisation of resources and minimisation of waste generation.

WATER:

Water utilisation will be maximised through recycling of dirty water within the process operations.

ENERGY:

Fuel types will be investigated as well as energy conserving measures will be implemented. Where solar energy can be utilised it will be implemented.

4.1.5 OPERATIONAL ASPECTS

Trizafield intend to make use of standard mining methods that enable safe mining which has the having the lowest risk of causing health risks or environmental degradation

4.1.6 NO PROJECT ALTERNATIVE

The alternative of not establishing this project was considered by the applicant. There will be no impact on the noise levels and the dust generation will be limited to the land occupiers frequenting the property.

The business would need to look at opportunities to find sand elsewhere. Employment opportunities will not be generated on the site. The land would remain fallow and not economically viable. The national asset (in this case, sand), that will not be made available for economic benefit to the South African people, will remain on the property. The ecological services will not be temporarily altered by mining and the social benefits will not be obtained from the creation of 20 employment opportunities for 30 years.

4.1.7 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

South Africa is known for its abundance of mineral resources. It is estimated to have the world's fifth-largest mining sector in terms of gross domestic product value and its mining companies are key players in the global industry. South African mining and mining real estate remains attractive for development. Mining creates an environment that lead the community to be more involved in the projects and result in more sustainable job creation strategies within the surrounding communities as well as attracting foreign investment.

In addition, the South African economy heavily relies on the mining sector. Mining for Concrete sand (Silica)- QO, Building sand (Silica)- QB, Crusher sand (Silica)- QC, Filling sand (Silica) QL, Foundry sand (Silica)- QF, Glass sand (Silica)- QG, Sand (General)- QY, Silica sand- QD minerals will boost the current struggling national economy. The mining sector has provided more employment opportunities for the citizens in general. The provincial citizens of the North West Province will be awarded more employment opportunities. Should the proposed mining operation be authorized, the following economic development activities will result:

- Job creation
- Development of skills
- Potential for business opportunities
- Establishment of bursaries and scholarships
- Stimulate economic activities in the local vicinity

4.1.7.1 ANALYSIS OF THE 'NEED' OF THE PROJECT

The proposed project is in line with the relevant IDP, SDF, EMF and PDP. There is no reason why this development should not be considered at this particular point in time considering the growing demand for sand.

4.1.7.2 ANALYSIS OF THE 'DESIRABILITY' OF THE PROJECT

Not only does it meet market demand but the economic contribution to the local economy is significant. Potential impact on the social, social, cultural and environmental aspects were

identified. These impacts were assessed for their effect on the social, cultural and environmental aspects. The significance of the impacts was also determined.

Mitigation measures are aimed at lessening negative consequences of the proposed mining operation. The mitigation measures include designs and management practises that will be embarked on, to prevent the identified impacts on the social, cultural and environmental aspects. For each significance identified, mitigation measures were specified. These mitigation measures are described in more detail in the environmental management programme.

Opportunities that exist within mining are as follows:

- Constant demand on the market for commodities;
- Establishment of a permanent working group between the Municipality and the mine managers responsible from developing local economic development initiative;
- Encourage local SMME's and entrepreneurs to take advantage of procurement;
- Develop a database of available labour and skills to encourage the employment of local people;
- Provide skills training and support programmes;
- Instigate mining procurement opportunities in consultation with the mines, develop a database of such opportunities and ensure that this information is made available to local businesses and communities.

For these to be achievable, investment and skills development, technology and infrastructure, as well as broadening of the supplier base, will need to be addressed.

5 PUBLIC PARTICIPATION (refer to appendices for proof of on-going consultation)

5.1 PUBLIC PARTICIPATION PROCESS FOLLOWED TO BE FOLLOWED

This section of the report provides an overview of the tasks undertaken for the PPP to date. All PPP undertaken is in accordance with the requirements of the EIA Regulations (2017). It further provides an outline of the next steps in the PPP and makes recommendations for tasks to be undertaken during the environmental assessment phase of the environmental authorisation process.

Property land owner have identified through a search conducted via online search engines accessing the Title Deed office database. Due to the size of the area municipal ward councillors will be engaged to assist with the notification and liaising with the legal occupiers of the application farms. In addition to land owners, other relevant organisations have been identified and will be notified of the application. This includes municipal and State departments with jurisdiction in the area and Non-governmental Organisations (NGOs) with an interest.

An initial consult meeting with I&AP's will be held in Borolelo Community Hall (near Swartruggens) to introduce the project and identify more I&AP's. Following this meeting another meeting will be held to discuss any issues regarding the published draft scoping report.

The PPP tasks include:

1. Identification of key Interested and Affected Parties (affected and adjacent landowners) and other stakeholders (organs of state and other parties);
2. Formal notification of the application to key Interested and Affected Parties (all adjacent landowners) and other stakeholders;
3. Consultation and correspondence with I&APs and Stakeholders and the addressing of their comments; and
4. Newspaper adverts.

I&AP AND STAKEHOLDER IDENTIFICATION, REGISTRATION AND THE CREATION OF AN ELECTRONIC DATABASE

Public Participation is the involvement of all parties who are either potentially interested and or affected by the proposed development. The principle objective of public participation is to inform and enrich decision-making. This is also its key role in this Environmental Impact Assessment (EIA) process.

Interested and Affected parties (I & APs) representing the following sectors of society has been identified:

- National, provincial and local government;
- Agriculture, including local landowners;
- Community Based Organisations;
- Non-Governmental Organisations;
- Water bodies;
- Tourism;
- Industry and mining;
- Commerce; and
- Other stakeholders.

5.1.1 FORMAL NOTIFICATION OF THE APPLICATION TO KEY INTERESTED AND AFFECTED PARTIES (ADJACENT LANDOWNERS) AND OTHER STAKEHOLDERS

The project was announced as follows:

NEWSPAPER ADVERTISEMENT

A newspaper advert was published on the 28th October 2021 in the local newspaper "Rustenburg Herald", giving notice to I & APs of the applicant's intention to mine the area as well as inviting all affected parties to a meeting where the applicant would provide full details of the project. The Rustenburg Herald is distributed in areas including Rustenburg, Boons, Bleskop, Brits, Buffelspoort, Derby, Elandsdraal, Groot-Marico,

Hartbeespoort, Karlienpark, Koster, Kroondal, Lichtenburg, Marikana, Moedwil, Mooiooi, Northam, Rex, RPM, Sun City, Swartklip, Swartruggens, Thabazimbi, Tlhabane, Waterfall Mall, Zinniaville and Zeerust.

SITE NOTICE PLACEMENT

Site notices written in English (A3 sized) were placed on the 27th of October 2021 in strategic areas such as Local Supermarkets, Kgetlengrivier Local Municipality, Swartruggens Community Library, Borolelo Community Hall, Swartruggens Police Station, filling station, Swartruggens Hospital, shops, schools, restaurants as well as portion 19 of the farm Woodstock 397 JP.

WRITTEN NOTIFICATION

I&APs were notified via email of the proposed project and the availability of the scoping report on the 26th of October 2021. A background information document, draft scoping report and landowner notification letters were sent out to the identified I&AP's. In addition, I&AP's have been given extra time to comment on the report so that during the EIA phase these issues can be addressed to avoid delays that may arise during consultation.

BACKGROUND INFORMATION DOCUMENT

A Background Information Document (BID) will be distributed (by email, fax or post) to adjacent land owners. The BID provides information concerning the proposed project and invites IAPs to register and to attend the public meeting. IAPs distributed the documents to other parties who may be interested or affected by the project.

REGISTERED LETTERS

Registered letters were sent via SA Post Office to the following authorities:

- Department of Water and Sanitation (DWS)
- DEDECT
- Kgetlengrivier Local Municipality
- Bojanala Platinum District Municipality
- North West Province: Regional Land Claims Commissioner
- South African Heritage Resources Agency (SAHRA)

- Eskom
- North West Department of Police, Roads and Transport
- North West Department of Social Development
- North West Tourism Authority

5.1.2 CONSULTATION AND CORRESPONDENCE WITH I&AP'S AND STAKEHOLDERS AND THE ADDRESSING OF THEIR COMMENTS (CONTINUOUS).

Acknowledgements from interested and affected parties, queries or registration requests are expected from stakeholders. A final public meeting report with minutes of the meeting will be compiled.

5.1.3 RELEASE OF THE REVISED AND AMENDED SCOPING REPORT TO I&AP'S AND STAKEHOLDERS FOR REVIEW AND COMMENT.

This scoping report has been released to the public for public review and comment. All stakeholders and I&AP's were notified of the report's availability for comment for 30 days from the 28th of October 2021 to the 29th of November 2021. Additional electronic and or hard copies will be made available to interested and affected parties and stakeholders who request for them. Hardcopies of the report will also be submitted to all organs of state and relevant authorities.

5.2 NEXT PHASES OF THE PUBLIC PARTICIPATION PROCESS

All comments and responses received and sent throughout the entire process will be updated and included in the comments and responses report which will be submitted to the DMRE. Note that this PPP Report shall be updated at each phase as required.

The draft and final EIAR/EMPr will be released for public review for 30 days each excluding public and school holidays. A final Consultation report with stakeholder comments from each phase will be submitted.

5.3 SUMMARY OF ISSUES RAISED BY I&AP'S

No comments have been received yet as this is the initial phase of public participation.

6 BASELINE RECEIVING ENVIRONMENT

6.1 CLIMATE

The proposed Trizafield Woodstock Sand Mine is located in a semi-arid region in the North West Province of South Africa. The climate of the area is characterized by warm summers, cold to moderate winters, with the main rainy season being in summer from October through to April. Average daily maximum temperatures range from 30.3°C in January to 21.2°C in July, with daily minima ranging from 17°C in January to just above 1.3°C in July. The average annual rainfall is 651 mm/year, and which falls mainly as thundershowers during the summer months of October through April. The average annual evaporation is 2185 mm/year which means that the climatic water balance is therefore in deficit, resulting in an effective annual average evaporation of 1534 mm/year. Extreme conditions of rainfall can occur with the 24 hour events for various return periods which can vary between 79 mm (1:5 yrs.) to 125 mm (1:50 yrs.) to 138 mm (1:100 yrs.).

6.2 REGIONAL CLIMATE

The project area falls within the summer rainfall region. The rainy season range from about November to April, with peak precipitation in January. The area receives a mean annual rainfall of about 582 mm.

6.3 WIND DIRECTION AND SPEED

Day time wind directions in the vicinity of the project site are dominated by north-westerly, through northerly to easterly winds. Day time calms are estimated at 23.4%. Night time wind directions are dominated by easterly to south-easterly winds. Night time calms are estimated at 39.4%. The impacts on the air quality of the area will be considered during the Impact Assessment Phase of the project.

6.4 EVAPORATION

The mean annual potential evaporation for the A22D Quaternary Catchment (Dwarsspruit Catchment) ranges between 1700-1800 mm/yr.

6.5 TOPOGRAPHY AND GEOGRAPHY

The proposed project area lies on the north-eastern parts of the North West Province within the Magisterial District Rustenburg. The North West Province is bounded by Botswana to the north and north-west, Limpopo Province to the north-east, Gauteng Province to the east, Free State Province to the south-east and Northern Cape Province on the south-western border. The project site lies within ward 3 of Kgetlengrivier Local Municipality which is under Bojanala Platinum District Municipality.

The proposed mining operations are located approximately 36 km west from the town of Rustenburg and 24 km north of Koster, within the Magisterial District of Rustenburg in the North West Province.

Immediate residential areas include Swartruggens, Borolelo, Dithabeneng, Tlhabane, Protea Park and Rustenburg. The project covers an area of about 109.773400 hectares (ha) in extent and lies at geographical coordinates -25.626500° south and -26.909700° east. The proposed mining site slopes approximately 1286 m above mean sea level to 1267 m (amsl). Access to the site is via a gravel road connected to the N4 national road. The N4 national road straddles (intersect) portion 19 of the farm Woodstock 397 JP.

Furthermore, the study area falls within A22D Quaternary Catchment (Dwarsspruit Catchment) of the Crocodile (West) and Marico water management area.

1.2 LAND USES

The project area is largely comprised of open spaces which are currently used for agricultural activities (livestock grazing and crop cultivation). Parts of portion 19 of the farm Woodstock 397 JP is currently being mined for sand under mining permits by different holders. A tributary of Dwarsspruit forms the eastern boundary of portion 19 of the farm Woodstock 397 JP. In addition, a farm dam exist within the project site.

6.6 BIODIVERSITY

The study area is located within the vast Savanna biome, which covers large parts of southern Africa and comprises the western portion of the Central Bushveld Bioregion.

Winterbach et al. (2000) define the Central Bushveld as the bushveld of the North-West and Northern Provinces situated north of the Magaliesberg between the Kalahari in the west and the Lowveld in the east.

The proposed sand mining operation falls within the Dwarsberg-Swartruggens Mountain Bushveld vegetation unit of the Savanna biome (Central Bushveld Bioregion).

6.6.1 DWARSBERG-SWARTRUGGENS MOUNTAIN BUSHVELD

Highly variable vegetation structure is locally found that is differentiated by diverse tree and shrub layers defined by variations in slope, aspect and habitat characteristics. Dominant trees include *Acacia robusta* and *A. erubescens*, *Burkea africana*, *Faurea saligna*, *Protea caffra*, as well as the succulent tree species *Aloe marlothii*. Locally common shrubs include *Athrixia elata*, *Ehretia rigida*, *Mundulea sericea*, *Searsia magalismontana* and *S. rigida*. In some places the woody layer may occur as bush clumps.

The grass layer is generally very dense with a great variety of grass species; inter alia *Cenchrus ciliaris* and *Loudetia simplex*. Common herbs thriving amongst the grasses include *Barleria macrostegia*, *Commelina africana* and *Hermannia depressa*. Some geophytic herbs are found in this vegetation unit, for example *Hypoxis hemerocallidea*.

Moreover, the 'Dwarsberg-Swartruggens Mountain Bushveld' provides habitat for the Central Bushveld endemic *Erythrophysa transvaalensis* and the South African endemic *Euphorbia perangusta*.

The conservation status is extremely low with only 2% conserved within the Marico Bushveld Reserve. Although classified as least threatened, 7% of the vegetation unit is affected by transformation through cultivation and the spread of alien species.

6.7 SOIL

Soils in semi-arid areas, like those found in the western Central Bushveld, are commonly shallow, stony and low in humus content due to superficial weathering and decomposition of organic matter respectively (Van der Meulen & Westfall, 1979; De Villiers & Mangold, 2002). Additionally, the low rainfall levels associated with semi-arid

regions produce soils that are only slightly leached, and thus tend to develop high concentrations of salts in the soil, particularly if evaporation rates are high, resulting in the formation of hardpans or surface duricrusts (De Villiers & Mangold, 2002). As a result, the soil characteristics constitute an influential factor for plant growth in the study area governing the vegetation types that are able to grow there.

According to Van der Meulen (1979), six general soil types can be distinguished in the western Central Bushveld. The lowlands of the Bushveld Basin are mainly occupied by ferruginous lateritic or fersiallitic soils, along with vertic black clay soils (Van der Meulen, 1979; Van der Meulen & Westfall, 1979).

Ferruginous soils are yellow to red residual soils develop from sedimentary, metamorphic or igneous rocks by intensive weathering together with considerable leaching of silica, generally characterized by the presence of kaolinite and hydrous oxides of iron and aluminium (Butt & Zeegers, 1992; Cole, 1996; www.thefreedictionary.com). These non-calcareous, shallow to deep, meso- to eutrophic sands and loams occur on Pretoria quartzites, bushveld granites and dolomite, as well as on Karoo deposits in the study area (Van der Meulen, 1979). They tend to be gravelly with coarse sand grains and may be underlain by iron hardpans that impede drainage (e.g. plinthosols) (Butt & Zeegers, 1992; Van der Meulen & Westfall, 1979). The corresponding soil forms are Hutton, Clovelly and Avalon; especially quartzites and dolomites have weathered to poor red apedal sands, classified as the Hutton Form in South Africa (Van der Meulen, 1978).

Fersiallitic soils are only slightly leached yellow to red latosols rich in iron and aluminium oxides, but still contain a substantial amount of silica, and usually also containing clay minerals such as kaolinite and montmorillonite (Van der Meulen, 1979; www.thefreedictionary.com). They are non-calcareous, shallow to deep, meso- to eutrophic loams and clays which occur on andesitic lavas, Pretoria shales, diabase intrusions, norites and Karoo sediments, forming red, more structured soils that belong mainly to the Shortlands Form (Van der Meulen, 1979).

6.8 FLORA SPECIES OF CONSERVATION IMPORTANCE

South Africa's Red List system is based on the IUCN Red List Categories and Criteria Version 3.1, amended to include additional categories to indicate species that are of local conservation concern. Species that are at risk of system is designed to detect risk of extinction. Species that are at risk of extinction, also known as threatened or endangered species are those that are classified in the categories Critically Endangered (CR), Endangered (EN) and Vulnerable (VU). The species listed below are known to occur in the ¼ degree grid in which the study area is located.

- A species is **Data Deficient** when taxonomic problems hinder the distribution range and habitat from being well defined, so that an assessment of risk of extinction is not possible;
- A taxon is **Near Threatened** when it has been evaluated against the criteria but does not qualify for Critically Endangered, Endangered or Vulnerable now, but is close to qualifying for or is likely to qualify for threatened category in the near future;
- A species is **Rare** when it meets at least one of four South African criteria for rarity, but is not exposed to any direct or plausible potential threat and does not qualify for a category of threat according to one of the five IUCN criteria;
- A species is **Threatened** when it is included in one of the Critically Endangered (Possible Extinct), Critically Endangered, Endangered or Vulnerable categories;

A total of 15 threatened plant species have been recorded in the North West to date (Hahn, 2013). This includes two (2) Critically Endangered (possibly Extinct), one (1) Data Deficient Critically Endangered, two (2) Endangered, and ten (10) Vulnerable species. Currently the Ngaka Modiri Molema District Municipality supports the most species of special concern. On evaluation of the previous and proposed conservation status of the plants in the province, the following nationally threatened species were identified (Hahn, 2013):

Critically Endangered

Brachystelma canum and *Brachystelma gracillimum*. Presently these two species are known only from the site where they were first observed/collected (referred to as their type locality) and are both possibly extinct due to habitat destruction.

Data Deficient Critically Endangered

Senecio holubii is taxonomically poorly understood and is presently only known from its type locality, which is under severe threat. Data deficiency is problematic in assigning it to a Critically Endangered status.

Endangered

Ceropegia insignis and *Euphorbia knobelii* (the Endangered *Euphorbia perangusta* is assigned here as being the same species as *E. knobelii*) (Hahn, 2013).

Vulnerable

Anacampseros dicapitata, *Aloe peglerae* (Magaliesberg aloe), *Brachystelma dimorphum*, *Brachystelma incanum*, *Barleria media*, *Ceropegia stentiae*, *Indigofera commixta*, *Lobelia cuneifolia* var. *ananda*, *Miraglossum laeve* and *Prunus africana* (red stinkwood or African cherry). The Vulnerable *Searsia maricoana* is assigned here as being the same species as *S. ciliata* (Hahn 2013).

6.9 FAUNA

MAMMALS

The South African derived threatened status by Friedmann and Daly (2004) is presented below, followed by the IUCN threatened status (where it differs) (Power, 2013). A total of 24 threatened mammal species have been recorded in the North West to date by Friedmann and Daly (2004). This includes two (2) Critically Endangered species, four (4) Endangered species, four (4) Vulnerable species and 14 Near Threatened species. The following mammals are nationally threatened species (Power, 2013):

Critically Endangered

Black rhinoceros (*Diceros bicornis minor*) (IUCN Vulnerable), short-eared trident bat (*Cloeotis percivali*) (IUCN Least Concern).

Endangered

African wild dog (*Lycaon pictus*), oribi (*Ourebia ourebi*) (IUCN Least Concern), tsessebe (*Damaliscus lunatus*) (IUCN Least concern) and white-tailed mouse (*Mystromys albicaudatus*).

Vulnerable

Cheetah (*Acinonyx jubatus*) (IUCN Vulnerable), ground pangolin (*Smutsia temminckii*) (IUCN Least Concern), roan antelope (*Hippotragus equinus*) (IUCN Least Concern) and sable (*Hippotragus niger*) (IUCN Least Concern).

Near Threatened

African marsh rat (*Dasymys incomptus*) (IUCN Least Concern), brown hyaena (*Hyaena brunnea*) (IUCN Near Threatened), Darling's horseshoe bat (*Rhinolophus darlingi*) (IUCN Least Concern), Dent's horseshoe bat (*Rhinolophus denti*) (IUCN Least Concern), Geoffroy's horseshoe bat (*Rhinolophus clivosus*) (IUCN Least Concern), honey badger (*Mellivora capensis*) (IUCN Least Concern), Rusty pipistrelle (*Pipistrellus rusticus*) (IUCN Least Concern), Schreibers' long-fingered bat (*Miniopterus schreibersii*) (IUCN Least Concern), serval (*Leptailurus serval*) (IUCN Least Concern), Southern African hedgehog (*Atelerix frontalis*) (IUCN Least Concern), spotted hyaena (*Crocuta crocuta*) (IUCN Least Concern), spottednecked otter (*Lutra maculicollis*) (IUCN Least Concern), straw-coloured fruit bat (*Eidolon helvum*) (IUCN Near Threatened) and Temminck's hairy bat (*Myotis tricolor*) (IUCN Least Concern). The Southern African hedgehog is however considered to be worthy of a Vulnerable status (Power, 2013).

The following six (6) species were assessed by Friedmann and Daly (2004) as Least Concern but have an IUCN or globally threatened status (Power, 2013):

- African savanna elephant (*Loxodonta africana*) (IUCN Vulnerable), black-footed cat (*Felis nigripes*) (IUCN Vulnerable), hippopotamus (*Hippopotamus amphibius*) (IUCN Vulnerable), leopard (*Panthera pardus*) (IUCN Near Threatened), lion (*Panthera leo*) (IUCN Near Threatened) and
- White rhinoceros (*Ceratotherium simum*) (IUCN Near Threatened), of which the latter is under the threat of poaching, and is entirely conservation-dependent.

- Irrespective of the species conservation status, the following 18 mammals are of concern in the province. This is because they have not been found, appear to be at lower densities than previously assessed or are under direct persecution threats (Power, 2013). Species not indicated above are presented with the national conservation status (and IUCN status where it differs):
- Black-tailed tree rat (*Thallomys nigricauda*) (Least concern), white-tailed rat, short-eared trident bat, Southern African hedgehog, ground pangolin, African striped weasel (*Poecilogale albinucha*) (Data deficient Friedmann and Daly (2004), IUCN Least concern), black-footed cat, African wild cat (*Felis silvestris*) (Least Concern), leopard, cheetah, African wild dog, white rhinoceros, black rhinoceros, roan antelope, tsessebe, Southern reedbuck (*Redunca arundinum*) (Least Concern), oribi and grey rhebok (*Pelea capreolus*) (Least Concern).
- Effort is required on the ground to determine if any of the golden moles are present in the province.
- Further inventories are required for the Chiroptera i.e. bats.

BIRDS SPECIES

A total of 40 threatened bird species have been recorded in the North West to date. This includes one (1) Endangered species, 18 Vulnerable species and 21 Near Threatened species. African skimmer (*Rynchops flavirostris*) have been recorded in the past but are now considered to be regionally Extinct (Tye, 2012). The following birds are nationally threatened species (Tye, 2012):

Endangered

Saddle-billed stork (*Ephippiorhynchus senegalensis*). There is only one record of this species in the North West, sited far from its usual distribution, which probably represents a rare vagrant individual.

Vulnerable

African finfoot (*Podica senegalensis*), African grass-owl (*Tyto capensis*), African marsh-harrier (*Circus ranivorus*), bateleur (*Terathopius ecaudatus*), blue crane (*Anthropoides paradiseus*), Cape vulture (*Gyps coprotheres*), Kori bustard (*Ardeotis kori*), Denhams

bustard (*Neotis denhami*), lappetfaced vulture (*Aegypius tracheliotos*), lesser kestrel (*Falco naumanni*), martial eagle (*Polemaetus bellicosus*), pink-backed pelican (*Pelecanus rufescens*), tawny eagle (*Aquila rapax*), white-backed night-heron (*Gorsachius leuconotus*), white-backed vulture (*Gyps africanus*) and white-bellied korhaan (*Eupodotis cafra*).

Near Threatened

African openbill (*Anastomus lamelligerus*), Ayre's hawk-eagle (*Hieraetus ayresii*), black harrier (*Circus maurus*), black stork (*Ciconia nigra*), black-winged pratincole (*Glareola nordmanni*), caspian tern (*Sterna caspia*), chestnut-banded plover (*Charadrius pallidus*), great white pelican (*Pelecanus onocrotalus*), greater flamingo (*Phoenicopterus roseus*), greater paintedsnipe (*Rostratula benghalensis*), halfcollared kingfisher (*Alcedo semitorquata*), lanner falcon (*Falco biarmicus*), lesser flamingo (*Phoeniconaias minor*), Marabou stork (*Leptoptilos crumeniferus*), melodious lark (*Mirafra cheniana*), pallid harrier (*Circus macrourus*), peregrine falcon (*Falco peregrinus*), red-billed oxpecker (*Buphagus erythrorhynchus*), secretarybird (*Sagittarius serpentarius*), short-clawed lark (*Certhilauda chuana*), yellow-billed stork (*Mycteria ibis*) and yellow-throated sandgrouse (*Pterocles gutturalis*).

FISH

The following fish are nationally threatened, endemic or important species (Roux, 2015b):

Vulnerable

The Groot Marico, Rooikloofspruit, Vanstraatensvlei, Waterkloofspruit and Upper Sterkstroom support the Vulnerable Marico barb (*Barbus motebensis*). The Vulnerable Goldie barb (*Barbus* sp. 'pallidus cf. north') inhabits the Mooi River, a tributary of the Vaal River.

Near-Threatened

An important refugia area for the Near Threatened Orange-Vaal largemouth yellowfish (*Labeobarbus kimberleyensis*) is the Taung Dam; and possibly the Vaal River catfish (*Austroglanis sclateri*) in the Harts River. It is therefore important that the river condition is

improved to allow stable populations of these fish. The Near Threatened Waterberg barb (*Barbus* sp. 'Waterberg') occurs in the Molopo River above Mahikeng (Roux, 2015b), and the headwaters of the Groot Marico, Klein Marico and Koster rivers (NFEPA metadata, Nel et al., 2011).

Endemic and important

The Marico River supports the endemic Canary kurper (*Chetia flaventris*) and is a migration route for eels (*Anguilla mossambica*).

FROGS (AMPHIBIAN)

The following frog is a nationally threatened species (Power and Verbugt, 2014):

Near Threatened

The giant bullfrog (*Pyxicephalus adspersus*) relies on temporary wetlands and dams in the province. This species was recorded in the northern bushveld regions, as well as the western Kalahari, as far west as Bray. It is not as threatened as the much talked about Gauteng populations.

REPTILES

The following reptiles are nationally threatened or endemic species (Power and Verbugt, 2014):

Vulnerable

The Nile crocodile (*Crocodilus niloticus*) is found throughout the bushveld region but is rare in the province.

Near Threatened

The coppery grass lizard (*Chamaesaura aenea*) occurs marginally in the province, inhabiting montane grasslands on the eastern Highveld of the country. The striped harlequin snake (*Homoreselaps dorsalis*) also inhabits grassland on the South African Highveld and does not favour frequent fires.

- Although the southern African python (*Python natalensis*) is classified as Least Concern, it is evaluated as a species of special concern because it is used in the

muti and pet trade industries; and is considered a problem species that necessitates removal. The species appears to be expanding its distribution range, which can only be to its benefit.

SPIDERS AND SCORPIONS (ARACHNIDS)

Spiders and scorpions are not only an important food source for many mammals and birds, they also consume insects, many of which represent agricultural pests. They are therefore a key component of the ecosystems of the province that maintain ecological processes, while serving an ecosystem service that supports the province's economy as well. Many also have medicinal value due to them possessing venom, with the button spiders (*Latrodectus geometricus* and *L. renivulvatus*), sac spiders (*Cheiracanthium* species) and violin spiders (*Loxosceles* species) representing those of potential value. Spider endemism in the province was recorded as higher for the Savanna biome (366) compared with the Grassland biome (58), with a further 322 near-endemics recorded (Foord et al., 2011b cited in Power, 2014). Although none of the province's spider and scorpions are threatened, 17 spiders were assessed as species of special concern based on rarity and endemism (Power, 2014). These include:

- Family Corinnidae Corrinid sac spiders – *Austrachelas merwei*.
- Family Cyatholipidae: *Cyatholipus isolatus*.
- Family Gnaphosidae: Ground spiders – *Setaphis sexmaculata*.
- Family Idiopidae: Armoured trapdoor spiders – *Galeosoma coronatum*, *Galeosoma crinitum*, *Galeosoma scutatum* and *Idiops pullus*.
- Family Salticidae: Jumping spiders – *Aelurillus cristatopalpus*, *Afromarengo bimaculata*, *Evarcha flagellaris*, *Langona manicata*, *Pseudicius gracilis* and *Rhene konradi*.
- Family Segestriidae: Tube-dwelling spiders – *Ariadna similis*.
- Family Sparassidae: Huntsman spiders – *Eusparassus borakalalo*.
- Family Tetragnathidae: Long-jawed orb weavers – *Diphyia simonyi*.
- Family Zodariidae: Zodariid ground spiders – *Diores femoralis*.

6.10 PROTECTED CONSERVATION AREAS

Pilanesberg National Park is the nearest conservational area located approximately 30 km north and north-east from the proposed mining operation. The park is the fourth largest National Park in Southern Africa covers an area of 58 000 hectares. Pilanesberg National Park is located in the North West Province of South Africa, 150 kilometres North-West of Gauteng and 60 kilometres north of Rustenburg. Prior to its establishment in 1979, most of the land was used for farming.

Encircling this unique area are four rings of hills; a geological fascinating alkaline complex produced by volcanic action some 1,2 billion years ago. The Park boasts healthy populations of lion, leopard, black and white rhino, elephant and buffalo – Africa's Big Five. There is a wide variety of rare and common species. A few of the endemic species that may be seen here are the nocturnal brown hyena, the fleet-footed cheetah, the majestic sable, as well as giraffe, springbok, zebra, hippo and crocodile. Bird watching is excellent with over 360 species recorded.

6.11 GEOLOGY

The farm Woodstock 397 JP is underlain by the Daspoort Formation which forms part of the Pretoria Group in the Transvaal Supergroup which covers a large area in the northern parts of South Africa. This formation stretches from just across the Botswana border in the west through the Pretoria area in the central region of the preserved Pretoria Group basin, towards Carolina in the E-SE, and curves to the northeast in the direction of Lydenburg and further north thereof. Isolated outcrops are found near Groblersdal in the east and Balmoral in the southeast. The Daspoort Formation is also observed in the north near Mokopane (Potgietersrus) and in scattered outcrops towards the north western parts of the basin, south and southwest of Thabazimbi.

According to Eriksson et al.: (1993). Daspoort sedimentation began with alluvial gravel and fluvial sand lobes of syn-rift affinity, which became drowned in the east of the basin by a transgressive marine palaeoenvironment. The Daspoort Formation is characterized by eastern shallow marine sandstones which were formed coeval with western fluvial deposits. The Daspoort Formation is characterized by commonly massive, clean, mature

sandstones. Predominant recrystallized fine- to medium grained sandstones with lesser conglomerates, coarse-grained sandstones and some minor mudrocks and ironstones occur (Eriksson et al., 1993). Diagenesis and low grade metamorphism (due to Bushveld intrusion) of the Pretoria sedimentary rocks resulted in recrystallization of the Daspoort sandstones in many areas, producing quartzites.

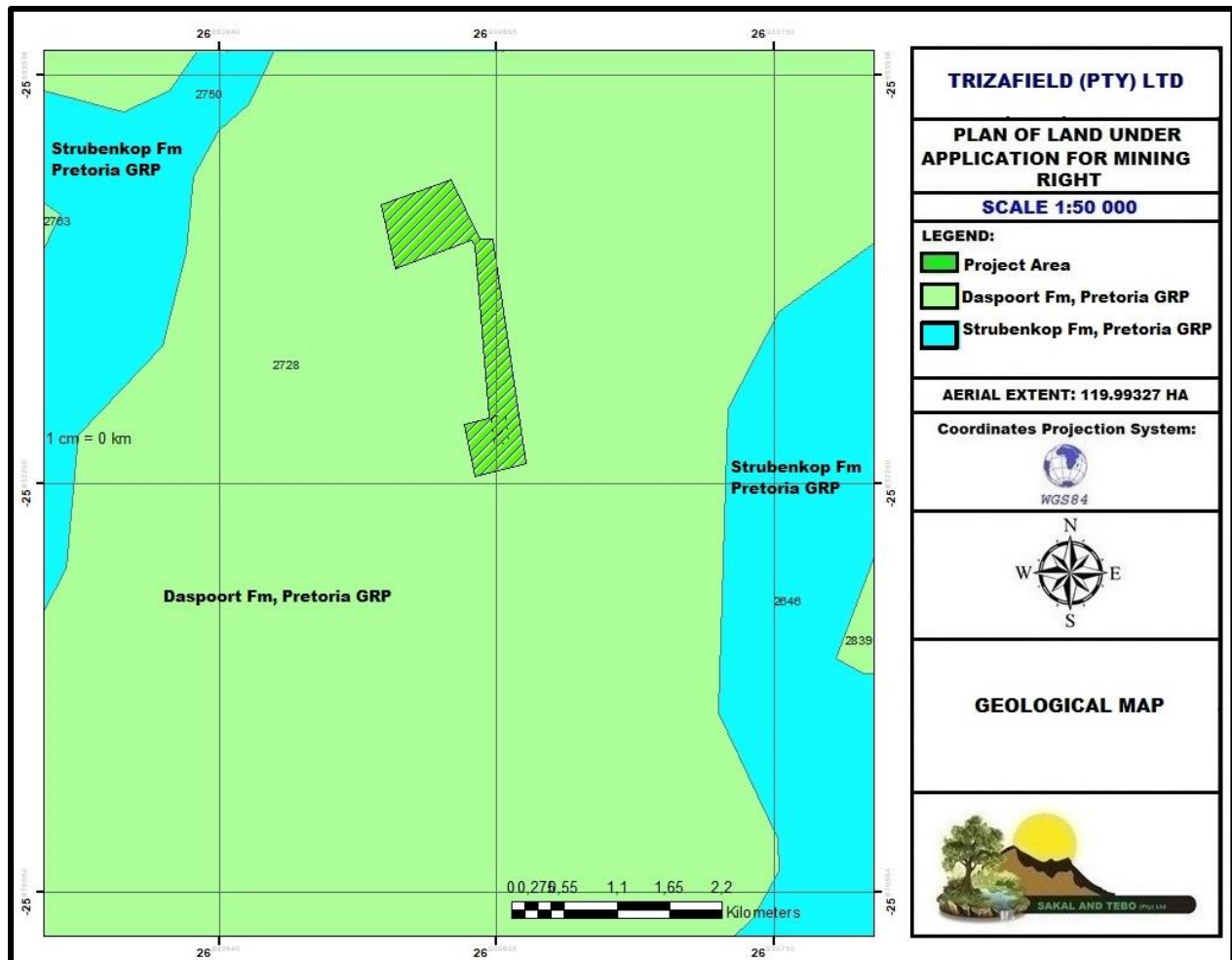


Figure 2-1: Geological map of the study area

6.12 SURFACE HYDROLOGY

The study area falls within A22D Quaternary Catchment (Dwarsspruit Catchment) of the Crocodile (West) and Marico water management area. The Dwarsspruit catchment covers an aerial extent of approximately 542 km². The Selons River, Koster River and Dwarsspruit are the most important watercourse in the catchment. Dwarsspruit and Koster River forms a tributary of the Selons River which recharges the Elands River. The Elands River originates west of Koster, North West Province, flowing northwards across Swartruggens into the Lindleyspoort Dam. A few kilometers downstream from the dam wall it bends eastwards east of Silwerkrans and goes meandering in an ENE direction across the veld for many miles. Further east it flows right south of the Pilanesberg, barely 1.5 km from the outer perimeter of the ancient crater formation. The Elands continues flowing eastward to the Vaalkop Dam. Finally, about 5 km downstream, it joins the Crocodile River's left bank. Its main tributaries are the Koster River, Selons River and Hex River, the latter joining its right bank at the Vaalkop Reservoir. In addition, the Dwarsspruit lies about 2 km north-west from portion 19 of the farm Woodstock 397 JP. A farm dam exist within the project area. No wetland features were identified on site.

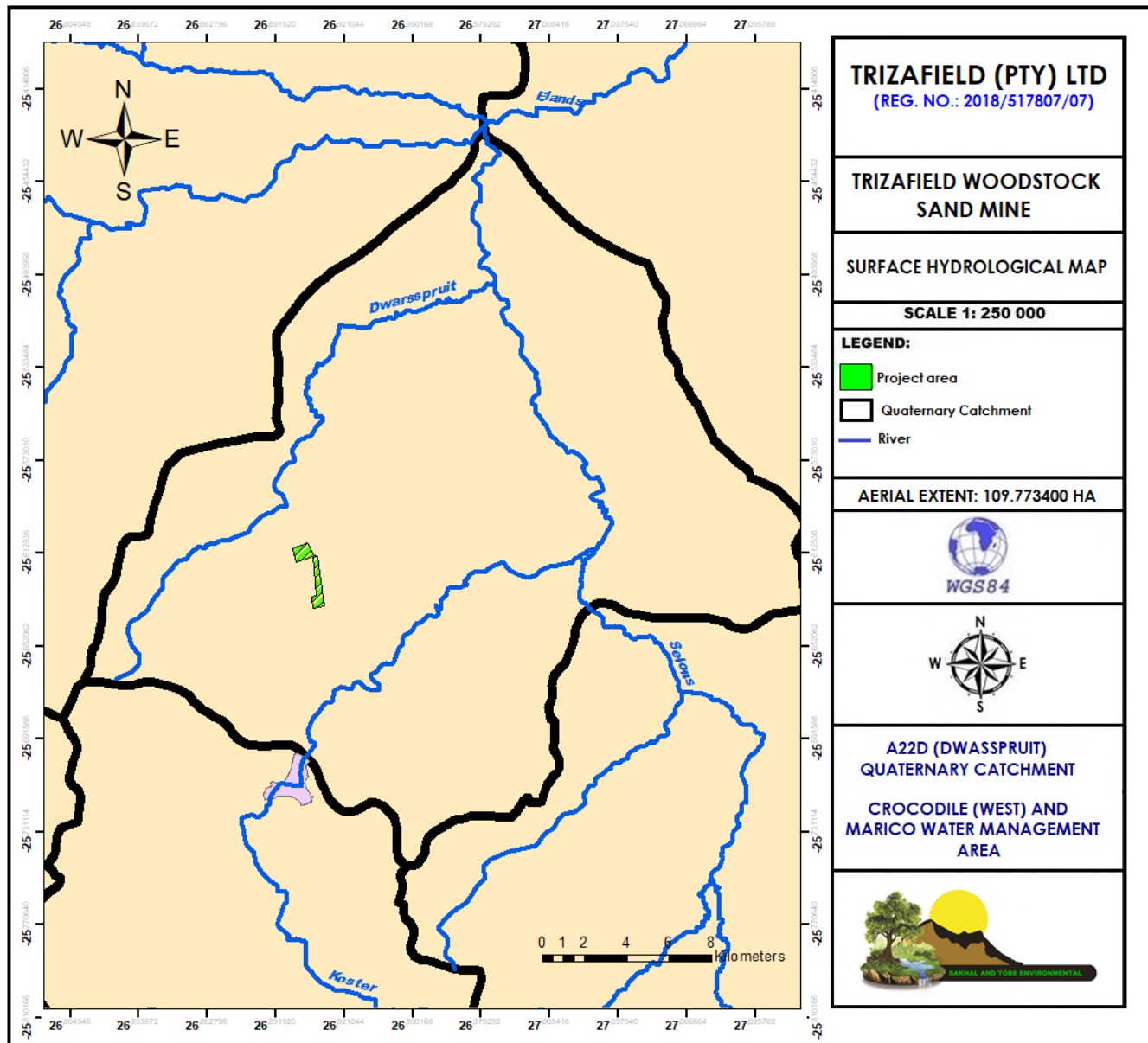


Figure 2-2: Surface Hydrological Map

6.13 CROCODILE (WEST) AND MARICO WATER MANAGEMENT AREA

The study area falls within A22D Quaternary Catchment (Dwarspruit Catchment) of the Crocodile (West) and Marico water management area (WMA). The Crocodile (West) and Marico WMA is defined by the following Catchments: Crocodile River, Marico River, South African portion of Ngotwane River and the Upper Molopo River. The area forms part of the Limpopo River basin, which spans the four countries of Botswana, Zimbabwe, South Africa and Mozambique. The area covers approximately 48 000 km² with the largest being the Crocodile

River catchment (29 349 km²) followed by the Marico River catchment (12 049 km²). The remainder is covered by the Ngotwane River and Upper Molopo River catchments at approximately 5 000 km² and 1 800 km² respectively (DWAF, 2004).

The Crocodile West and Marico WMA is one of the many water stressed catchments in South Africa. Surface water resources are used extensively, particularly in the Crocodile River catchment, with the main water users being agriculture, industry, mining and urban. Agriculture accounts for about 33.5% of total use and largely utilises privately owned dams and Government water schemes. Rand Water, Magalies Water and the North West Water Authority supply most of the mining, industrial and domestic sectors with water from sources within the catchment as well as from transfers from the Upper Vaal River system, which receives a significant amount of return flow from Tshwane. Approximately 70% of the population within the WMA lives in urban areas. The main economic activities revolve around mining, agriculture and light industry.

Furthermore, the Crocodile (West) and Marico WMA has been divided into four main sub-areas Upper Crocodile, Apies-Pienaars, Elands, and the Lower Crocodile. Trizafield Woodstock Sand Mine falls within A22D Quaternary Catchment within the Eland sub-area. The Elands sub-area forms the western drier portion of the Crocodile River Catchment. Rustenburg is the main urban centre in this sub-area and has grown rapidly in recent years due to the expansion of platinum mining activities here. There is potential for new mines to develop in this area. Local water resources are under-utilised, while significant volumes of water are transferred to this area from the Vaal River System. There is a significant amount of irrigation in this area (50 km²), mostly situated along the northern foothills of the Magaliesberg. The State/Tribal Authorities own a large portion of this area. Due to the vibrant economic activity in this area, people here (both urban and rural), and in the Upper Crocodile area, tend to be better off socio-economically than people in other parts of the country. The rapid economic growth in this sub-area will certainly lead to increased water requirements. These increased requirements should be supplied from local sources, such as Bospoort Dam which is underutilised or increasing return flows in the Crocodile River (DWAF, 2004).

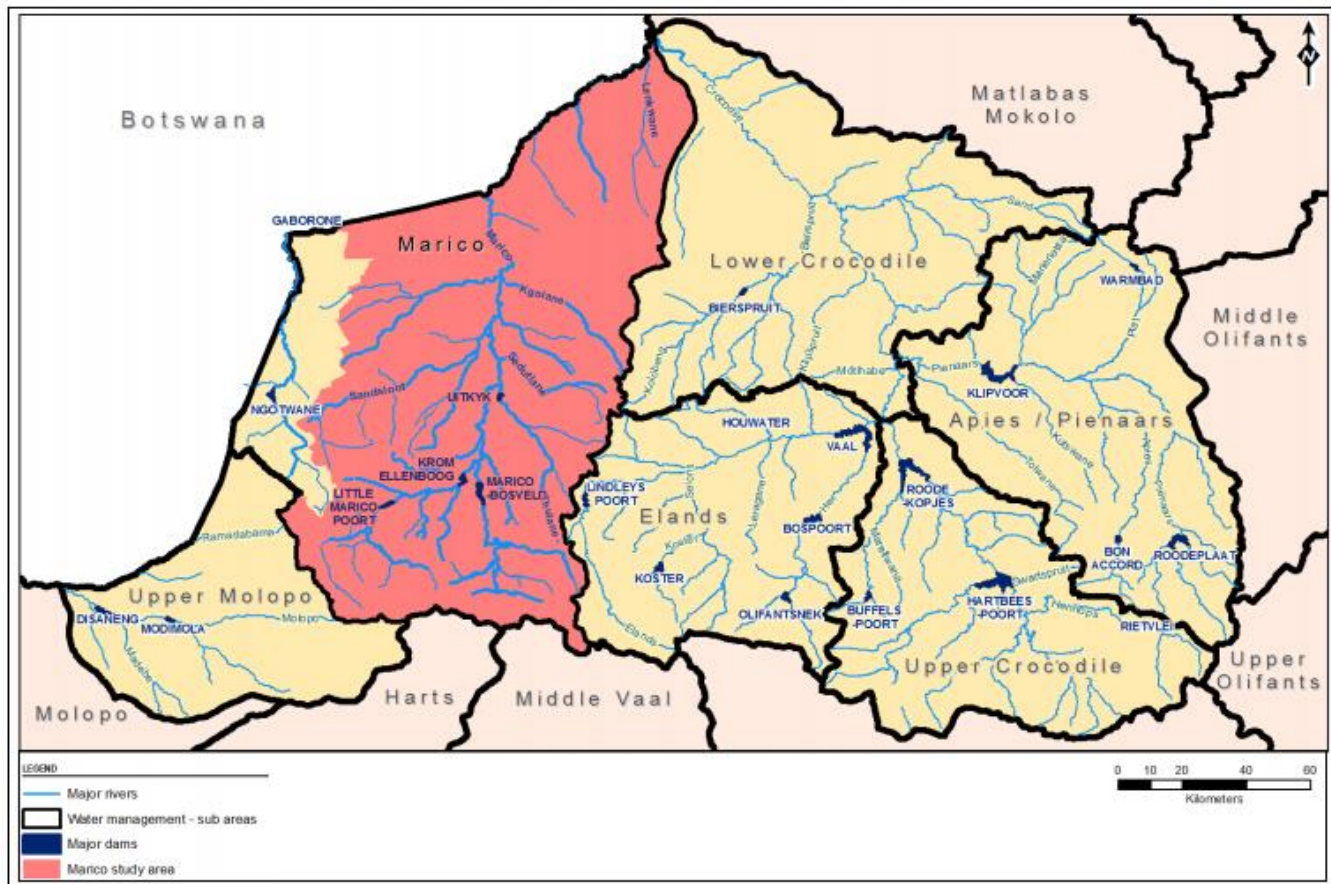


Figure 2-3: Crocodile (West) and Marico WMA

6.14 NOISE

The area around Rustenburg is characterised by the presence of a large number of mining related activities. Industrial noise forms part of the present ambient noise climate in the environment. The result of the industrial character of the present ambient noise climate in the pre-mining environment is, that any new mining related developments will probably have an impact localised to the immediate vicinity of the development. The following are noise sources in the vicinity of and the boundaries of the study area:

- Plant activities;
- Mining activities;
- Seasonal agricultural activities;
- Traffic noise along the feeder roads;
- Distant traffic noise from the abutting feeder roads;
- Insects;
- Birds; and

- Wind.

6.15 VISUAL ASPECT

Visual appreciation or dislike is subjective, and thus, what is aesthetically pleasing to some can be displeasing to others. The visual analysis of a landscape, the impact of new developments, as well as, structures tend to be complicated, and it is evident from previous experience that when dealing with the reaction to landscape changes, a broad diversity of opinion exists.

In this regard, mining is one of the vital land uses and contributes significantly to the visual degradation of parts of the study area. Since parts of the project site have historically been mined-out, the visual impact already exists and is associated with the mining landscape. Within the receiving environment, specific viewers (visual receptors) experience different opinions of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors include:

- Residents;
- Tourists; and
- Motorists.

6.16 AIR QUALITY

Potential sources of dust may be caused by moving vehicles and earthworks during mining. Major air emissions sources that may impact on the vicinity application area include the following:

- Smaller air emissions sources categories include:
 - Motor vehicles
 - Biomass burning (wood fires)
 - Sand and gravel mining activities in portion 19 of the farm Woodstock 397 JP

6.17 SITES OF ARCHAEOLOGICAL AND CULTURAL INTEREST

No sites of archaeological or cultural interest were identified on site during a site reconnaissance visit. Property owners will be provided with a registration and comment sheet in order to raise or highlighted cultural or archaeological features that may be occurring on site.

The project area is largely comprised of open spaces which are currently used for agricultural activities (livestock grazing and crop cultivation). Parts of portion 19 of the farm Woodstock 397 JP is currently being mined for sand under mining permits by different holders. A tributary of Dwarsspruit forms the eastern boundary of portion 19 of the farm Woodstock 397 JP. In addition, a farm dam exist within the project site.

As a matter precaution, should any further information confirm existence of such sites, steps will be taken to put measures in place for preservation thereof in line with the National Heritage Resources Act, 1999 (Act No. 25 of 1999). The South African Heritage Resources Agency (SAHRA) will also be notified of such findings,

7 ENVIRONMENTAL IMPACT ASSESSMENT

7.1 ASSESSMENT CRITERIA

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure.

7.1.1 EXTENT

The physical and spatial scale of the impact is classified as:

a) Footprint

The impacted area extends only as far as the activity, such as footprint occurring within the total site area.

b) Site

The impact could affect the whole, or a significant portion of the site.

c) Regional

The impact could affect the area including the neighbouring properties, the transport routes and the adjoining towns.

d) National

The impact could have an effect that expands throughout the country (South Africa).

e) International

Where the impact has international ramifications that extent beyond the boundaries of South Africa.

7.1.2 DURATION

The lifetime of the impact, that is measured in relation to the lifetime of the proposed development.

a) Short term

The impact would either disappear with mitigation or will be mitigated through natural processes in a period shorter than that of the construction phase.

b) Short to Medium term

The impact will be relevant through to the end of the construction phase.

c) **Medium term**

The impact will last up to the end of the development phases, where after it will be entirely negated.

d) **Long term**

The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.

e) **Permanent**

This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient,

7.1.3 INTENSITY

The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. The intensity is rated as:

a) **Low**

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

b) **Medium**

The affected environment is altered, but functions and processes continue, albeit in a modified way.

c) **High**

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.

7.1.4 PROBABILITY

This describes the likelihood of the impacts actually occurring. The impact may occur for any length during the life cycle of the activity, and not at any given time. The classes are rated as follows:

a) **Impossible**

The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is zero (0%).

b) **Possible**

The possibility of the impact occurring is very low, due either to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.

c) **Likely**

There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.

d) **Highly likely**

It is most likely that the impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.

e) **Definite**

The impacts will take place regardless of any provisional plans, and or mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100%.

7.1.5 MITIGATION

The impacts that are generated by the development can be minimised if measures are implemented in order to reduce the impacts. The mitigation measures ensure that the development considers the environment and the predicted impacts in order to minimise impacts and achieve sustainable development.

7.2 DETERMINATION OF SIGNIFICANCE – WITHOUT MITIGATION

Significance is determined through a synthesis of impacts as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact “without mitigation” is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as “positive”. Significance is rated on the following scale:

a) **No significance**

The impact is not substantial and does not require any mitigation action.

b) **Low**

The impact is of little importance, but may require limited mitigation.

c) Medium

The impact is of importance and is therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.

d) High

The impact is of major 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. Mitigation is therefore essential.

7.3 DETERMINATION OF SIGNIFICANCE – WITH MITIGATION

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

a) No significance

The impact will be mitigated to the point where it is regarded as insubstantial.

b) Low

The impact will be mitigated to the point where it is of limited importance.

c) Low to Medium

The impact is of importance however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

d) Medium

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

e) Medium to High

The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.

f) High

The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as

high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

7.3.1 ASSESSMENT WEIGHTING

Each aspect within the impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it is necessary to weigh and rank all criteria.

7.3.2 RANKING, WEIGHTING AND SCALING

For each impact under scrutiny, a scale weighting Factor is attached to each respective impact (refer to Figure 7-1: Description of biophysical assessment parameters with its respective weighting). The purpose of assigning such weight serve to highlight those aspects considered most critical to the various stakeholders and ensure that each specialist's element of bias is taken into account. The weighting factor also provides a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspects criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance.

Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

Figure 7-1: Description of biophysical assessment parameters with its respective weighting

7.3.3 IDENTIFYING THE POTENTIAL IMPACTS WITHOUT MITIGATION (WOM)

Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).

Equation 1:

Significance Rating (WOM) = (Extent + Intensity + Duration + Probability) x Weighting Factor

7.3.4 IDENTIFYING THE POTENTIAL IMPACTS WITH MEASURES (WM)

In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it was necessary to re-evaluate the impact.

- **Mitigation Efficiency (ME)**

The most effective means of deriving a quantitative value of mitigated impacts is to assign each significance rating value (WOM) a mitigation effectiveness (ME) rating. The allocation of such a rating is a measure of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will manage the impact.

Thus, the lower the assigned value the greater the effectiveness of the proposed mitigation measures and subsequently, the lower the impacts with mitigation.

Equation 2:

Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency

Or **WM = WOM x ME**

- **Significance Following Mitigation (SFM)**

The significance of the impact after the mitigation measures are taken into consideration. The efficiency of the mitigation measure determines the significance of the impact. The level of impact is therefore seen in its entirety with all considerations taken into account.

7.3.5 IMPACTS IDENTIFIED

A number of negative impacts on the bio-physical environment could result from disturbances during mining. The significance of any potential impact is largely limited by the small physical size and short duration of the mining, but also by the sensitivity of the receiving environment or receptor(s).

Potential impacts resulting from the proposed project were identified using input from the following:

- Views of I&APs;
- Existing information;
- Site visit with the project team and
- Legal and policy requirements that need to be fulfilled for the proposed project

The following potential impacts were identified:

- Ground and surface water contamination;
- Geology, soil and land capability;
- Socio-economic issues;
- Waste products;
- Floral and faunal displacement;
- Dust and noise impacts;
- Traffic; and
- Identified heritage sites.

The primary environmental impacts associated with mining detailed in this report are related to these main releases: dust emissions, produced water, ground water contamination and dewatering. Mining poses risks to these resources through contamination, sediment loads, water consumption and vegetation loss. The impact is largely mitigated by operational practices (drip trays, bunds, and container water storage units) and responsive management (safe waste storage and disposal, spill response). Restricting mining activities to further than 100 m from all watercourses largely eliminates the risk. Vehicles should not enter or cross water courses except on established roads.

All produced water must be stored in impervious containers until its quality is determined by laboratory analysis. In portions of the mining area where mining occurred testing the surface

water and groundwater during prior and during mining will set monitoring parameters of the activities. The best practicable environmental option for the management of produced water can only be determined once its quality is known. Production water may only be utilised for activities for which the quality is suitable (as defined by the DWS Water Use Guidelines and SANS 241). If unsuited for use or release then the produced water will need to be treated or disposed of. With these management measures in place no significant impacts are anticipated. The volume of water produced and stored on surface must remain within the limits of the DWS and a WUL must be obtained.

Localised compaction and soil erosion is highly likely due to heavy vehicle movement. Small scale and isolated spillages of hydrocarbons or chemicals may occur but can generally be prevented or treated in-situ with a suitable remediation product.

Wear and tear or accidental damage to private infrastructure could result. The use of any existing infrastructure or placement of new infrastructure will be through an access agreement negotiated between the mining right holder and the land owner/occupier (The land is state owned). Thus, the land owner will have a direct say in which infrastructure is used. If there are any damages, Trizafield will be responsible for effecting satisfactory repairs for any damages

Sensitive sites will be identified by the National Protected Area Expansion Strategy (NPAES), Threatened Ecosystems, Provincial Biodiversity Conservation Plan and Birdlife's Important Bird Areas programme. Land use transformation is one of the key risks to the grassland habitat and has significant influence on the habitat quality, occurrence of species of conservation concern and ecosystem services provided. Mining will result in the disturbances to vegetation and could affect habitat quality. The scale of physical disturbances to the land surface is expected to be medium. Given that the location of the land is already transformed. No mining may take place within protected areas as defined in terms of the NEMPAA and in indigenous vegetation in areas of potential high biodiversity sensitivity.

The EMP defines the categories of biodiversity sensitivity in which mining may not be undertaken. Every potential site must be subjected to an Environmental Site Assessment by an independent Environmental Scientist.

Public access the mining area must be prevented and must be secure and provisioned with warning signage in appropriate languages. Open excavations must be fenced. Livestock must not be allowed to gain entry to the mine site or any of the mining equipment or materials. All gates on a property must be kept in the status as agreed with the land owner and livestock must not be allowed to escape.

Safety and security on farms is an acknowledged concern. Additional access points to farms and unfamiliar persons in the district could increase the risks. Access for mining must not be allowed to compromise safety and security. Mining personnel may only access farms in terms of an access agreement negotiated with the land owner/occupier. Where appropriate the access points to a farm must be fitted with locks. Mining personnel must report unknown persons to security and mine management.

Veld fires and resulting damages to assets are a high risk as the area has high fuel loads and experiences windy conditions. With planning, risks assessments, site management and emergency procedures in place the risk can be greatly reduced can be prevented. Specific measures may be required at each mining block site and these must be set out in the EMP.

Mining activities will provide employment opportunities and some stimulation of the local economy through the purchase of supplies and equipment. The applicant must, wherever possible, source the materials and equipment needed to operate the mining equipment and sustain the personnel locally. The employment and training of local persons, particularly HDIs, even for short-term jobs, should be prioritised by Trizafield and all of their sub-contractors.

Impact statement

The following key issues and potential impacts (direct and cumulative), was identified during the Scoping phase, which will together with potential cumulative impacts, be assessed during the Environmental Impact Assessment phase of the project and appropriate mitigation measures to reduce the identified impacts will be proposed.

Figure 7-2: Potential Direct Impacts identified

IMPACT	
SURFACE WATER	Alteration of the characteristics of a water resource Hydrological modification on storm water flow and watercourses.
	Deterioration of water quality
	The impact on ground and surface water by migration of contaminated water from the construction and operational phases.
	Impacts on surface water during the construction and operational phases.
GROUNDWATER	Impact on dewatering of the groundwater aquifer due to mining activities.
	Impact on ground and surface water by migration of contaminated water from the construction and operational phases.
	Deterioration of water quality
AIR QUALITY	Dust impacts on air quality during the mining phases.
SOIL, GEOLOGY AND MINERAL RESOURCE	Impact of vegetation clearance on soil erosion and surface water runoff during the mining phase
	Soil pollution during the mining phase
	Mining of resource underlying the site
TOPOGRAPHY	Alteration of the surrounding topography
ECOLOGICAL	Destruction of sensitive habitat
	Destruction of faunal habitat and faunal displacement
	Reduction in natural migratory routes and faunal dispersal patterns

IMPACT	
VISUAL	Minimisation of aesthetics and/or sense of place of the surrounding areas.
SOCIO-ECONOMICAL	Development and upliftment of the surrounding communities and infrastructure
	Development of the economic environment
HERITAGE	Alteration of archaeological, historical and paleontologic features

Figure 7-3: Potential Cumulative Impacts identified

IMPACT	
TRAFFIC	Increased traffic volumes within the mine and surrounding communities. (low)
AIR QUALITY	Decrease in air quality in the immediate surroundings of the mining site
HYDROLOGICAL	Cumulative loss of surface water functionality as a result of an increase in pollutants.
	Cumulative impact of hydrological modifications
ECOLOGICAL	Cumulative destruction of sensitive habitat.
	Cumulative impact of faunal habitat and displacement.
	Cumulative impact on natural migratory routes and faunal dispersal patterns.

IMPACT	
VISUAL	Cumulative impact of visual disturbances
NOISE, VIBRATION AND SHOCK	Cumulative impact of construction and operational noise as well as noise due to mining heavy vehicle movement
	Cumulative impact of vibration and shocks.
SOCIO-ECONOMICAL	Positive - Cumulative impact of development on the surrounding communities.
	Positive - Cumulative impact of development on the economic environment.
	Positive - Cumulative impact of the employment opportunities provided.

This section provides a list of potential impacts on environmental aspects separately in respect of each of the main project actions / activities and processes. The potential impacts are presented for each of the project phases in tabular format.

Figure 7-4: List of Potential Impacts

ACTIVITY	PHASE	POTENTIAL IMPACTS (UNMITIGATED)
Site preparation Bush clearing, removal of infrastructure, establishing construction area	Construction	Physical destruction and disturbance of biodiversity
	Operation	Air pollution
	Decommissioning	Disturbing noise Visual impacts
Open cast Mining	Operation	Loss of soil resources and land capability Physical destruction and disturbance of biodiversity Pollution of surface water resources

ACTIVITY	PHASE	POTENTIAL IMPACTS (UNMITIGATED)
		Contamination of groundwater Dewatering impacts Air pollution Disturbing noise Visual impact Blasting and vibration impacts
Water supply and use Delivery on site, storage of clean water	Construction Operation Decommissioning	Hazardous excavations during mining phase Loss of soil resources and land capability Disturbance of biodiversity Pollution of surface water resources Alteration of natural drainage patterns Contamination of groundwater Air pollution Visual impacts
Dirty water management Collection, storage of dirty water for re-use, recycling	Construction Operation Decommissioning	Hazardous excavations Loss of soil resources and land capability Pollution of surface water resources Contamination of groundwater Disturbing noise
Transport systems Use of access points, road transport to and from site for employees and supplies, movement within site boundary	Construction Operation Decommissioning	Loss of soil resources and land capability Disturbance of biodiversity Pollution of surface water resources Alteration of natural drainage patterns Contamination of groundwater

ACTIVITY	PHASE	POTENTIAL IMPACTS (UNMITIGATED)
		Disturbing noise Traffic impacts Visual impacts
Site / contract management Appointment of workers/contractors, site Management (monitoring, inspections, maintenance, security, access control), awareness training, emergency response, implementing and maintaining programmes	Construction Operation Decommissioning Closure	Management of the site plays a significant role in all identified impacts
Rehabilitation Replacing soil, slope stabilization, landscaping, re-vegetation, restoration	Construction Operation Decommissioning Closure	Hazardous excavations Loss of soil resources and land capability Disturbance of biodiversity Pollution of surface water resources Alteration of natural drainage patterns Contamination of groundwater Air pollution Disturbing noise Visual impacts
Maintenance and aftercare Inspection and maintenance of remaining facilities and rehabilitated areas	Closure	Loss of soil resources and land capability Disturbance of biodiversity Pollution of surface water resources Air pollution Visual impacts

7.3.6 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.

During the EIA phase all potential negative and potential impact will be identified, ranked and mitigation measures will be prescribed.

7.3.7 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

During the EIA phase all possible impacts will be assessed and an EMP outlining the risk and mitigation measures will be compiled.

7.3.8 Final Site Layout Plan

The figure below illustrates the proposed mine layout plan for the Trizafield Woodstock Sand Mine. The aerial extent of each facility has been highlighted in the tabulation below.

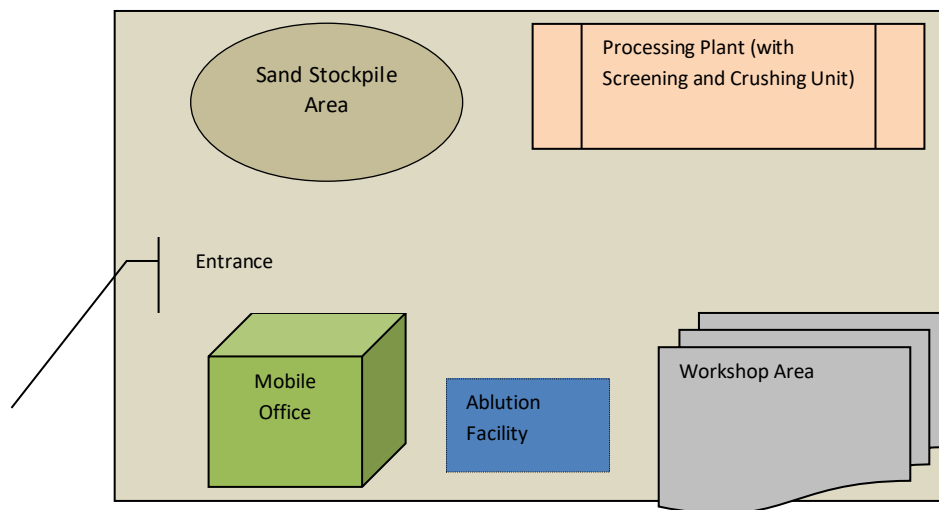


Figure 7-5: Proposed Site Layout

The Final Layout Plan will be provided in the EIA/EMP after public consultation as well as specialist recommendations excluding sensitive areas.

Table 7-1: Surface Footprint for Mine Infrastructure

FACILITY	AERIAL EXTENT (HECTARES)
Mine office complex	6.6 ha
Product stockpiles	12 ha
Processing Plant	5 ha
Workshop	2.5 ha
RoM stockpiles	5 ha
Parking bay	4 ha
Water containment facilities	1.8 ha
Access and haul roads	3 km

7.4 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

A plan of study for undertaking the environmental impact assessment process to be undertaken will include-

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- A description of the aspects to be assessed as part of the environmental impact assessment process;
- Aspects to be assessed by specialists;
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- A description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- particulars of the public participation process that will be conducted during the environmental impact assessment process; and
- a description of the tasks that will be undertaken as part of the environmental impact assessment process;
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The EIA phase will comprise of the following activities;

- Stakeholder Engagement;
- Assessing of Alternatives;
- Baseline and consideration of potential Specialist Studies;
- Identification of potential impacts
- Impact Assessment;
- Identification and Description of mitigation measures; and
- Reporting and decision-making.

7.4.1 DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The authorization process to be followed has been designed to meet the requirements of the MPRDA (Act 28 of 2002) and National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2017. The authorization process will include:

- Scoping Phase:
- Stakeholder Notification;
- Authority Consultation;
- Capturing of Issues and Concerns;
- Compilation of a Stakeholder Database;
- Identification of Potentially Significant Impacts;
- Identification of Potentially Sensitive Environmental Aspects;
- Identification of Required Specialist Studies;
- Compilation of a Scoping Report (this document), including:
- Plan of Study for EIA/EMP Amendment.
- Issues Report; and
- Stakeholder Review of Documentation;
- Submission and approval of Scoping Report by relevant authorities.
- Impact Assessment Phase:
- Undertake necessary specialist studies;
- Assessment of environmental impacts;
- Compilation of management plans;

- Compilation of an EMP Report;
- Stakeholder document review and comment;
- Submission of final report for decision-making.

The EMP Report will include a description of the proposed project, a list of identified environmental aspects that will potentially be impacted upon by the mining project, an Impact Assessment for these aspects, and an Environmental Management Programme for the mitigation and management of the identified impacts.

A plan of study for undertaking the environmental impact assessment process to be undertaken will include-

- a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
- a description of the aspects to be assessed as part of the environmental impact assessment process;
- aspects to be assessed by specialists;
- a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- a description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- particulars of the public participation process that will be conducted during the environmental impact assessment process; and
- a description of the tasks that will be undertaken as part of the environmental impact assessment process;
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SPECIALIST STUDIES

To assess the environmental, social and cultural impacts of the proposed Trizafield Woodstock Sand Mine, several specialist studies will be commissioned. The findings of these studies will be incorporated into the Environmental Impact Assessment Report (EIR). The specialist studies

consider the proposed structure and activities of the operations, as well as the associated risks to the receiving physical and socio-cultural environment.

The following aspects of the biophysical environment will be considered in the baseline studies:

- Surface hydrological
- Noise;
- Air Quality;
- Vegetation and Fauna;
- Heritage and Archaeology;
- Traffic;
- Social Impact;

7.4.2 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

AIR QUALITY IMPACT ASSESSMENT

Identification of existing sources of emissions in the region and the characterisation of existing ambient pollution concentrations is fundamental to the assessment of cumulative air impacts. A change in ambient air quality can result in a range of impacts, which in turn, may cause a disturbance to nearby receptors.

HYDROLOGICAL ASSESSMENT

Identification of catchment area, water sources impacting the project area as well as the potential impact of the mining activity on water quality.

ECOLOGICAL ASSESSMENT

Identification of flora and fauna and possible invasive species as part of the areas have been previously mined and agricultural activities were note on some of the farms.

NOISE IMPACT ASSESSMENT

Some of the noise generating activities associated with the project may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby receptors. As a baseline, this section provides a brief description of pre-mining conditions in the area from which to measure changes because of project-related noise.

TRAFFIC IMPACT

An increase in traffic on the existing roads and possible risks associated with the increased activities as well as the quality of the roads.

HERITAGE IMPACT ASSESSMENT

Identification and Protection of Heritage and historical and land marks and mitigation measures if such artefacts are encountered during mining.

7.4.3 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS INCLUDING THE PROPOSED METHOD OF ASSESSING ALTERNATIVES

Methodology for Assessing Environmental Issues and Alternatives

According to National Environmental Management Act (107/1998): Environmental Impact Assessment Regulations, 2017), the environment is described as the surrounding within which human exist and that are made up of:

- (i) the land, water and atmosphere of the earth;*
- (ii) micro-organisms, plant and animal life;*
- (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and*
- (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.*

IMPACT ASSESSMENT METHODOLOGY**(a) Nature of the impact**

The NATURE of an impact can be defined as: "a brief description of the impact being assessed, in terms of the proposed activity or project, including the socio-economic or environmental aspect affected by this impact".

(b) Extent of the impact

The EXTENT of an impact can be defined as: "a brief description of the spatial influence of the impact or the area that will be affected by the impact".

EXTENT Extent or spatial influence of impact	Footprint	Only as far as the activity, such as footprint occurring within the total site area
	Site	Only the site and/or 500m radius from the site will be affected
	Local	Local area / district (neighbouring properties, transport routes and adjacent towns) is affected
	Region	Entire region / province is affected
	National	Country is affected

(a) Magnitude of the impact

The **MAGNITUDE** of an impact can be defined as: "a brief description of the intensity or amplitude of the impact on socio-economic or environmental aspects".

MAGNITUDE Magnitude / intensity of impact (at the specified scale)	Zero	Natural and/or social functions and/or processes remain <i>unaltered</i>
	Very low	Natural and/or social functions and/or processes are <i>negligibly</i> altered
	Low	Natural and/or social functions and/or processes are <i>slightly</i> altered
	Medium	Natural and/or social functions and/or processes are <i>notably</i> altered
	High	Natural and/or social functions and/or processes <i>severely</i> altered

(b) Duration of the impact

The **DURATION** of an impact can be defined as: "a short description of the period of time the impact will have an effect on aspects".

DURATION	Short term	Construction phase up to 3 years after construction
Duration of		

the impact	Medium term	Up to 6 years after construction
	Long term	More than 6 years after construction

(c) Probability of the impact occurring

The PROBABILITY of an impact can be defined as: "the *estimated chance of the impact happening*".

PROBABILITY	Unlikely	Unlikely to occur (0 – 25% probability of occurring)
	Possible	May occur (26 – 50% chance of occurring)
	Probable	Likely to occur (51 – 75% chance of occurring)
	Definite	Will certainly occur (76-100% chance of occurring)

(d) Degree to which impact can be reversed

The REVERSABILITY of an impact can be defined as: "the *ability of an impact to be changed from a state of affecting aspects to a state of not affecting aspects*".

REVERSABILITY	Reversible	Impacts can be reversed through the implementation of mitigation measures
	Irreversible	Impacts are permanent and can't be reversed by the implementation of mitigation measures

(e) Degree to which impact may cause irreplaceable loss of resources

The IRREPLACEABILITY of an impact can be defined as: "the amount of resources that can (not) be replaced".

IRREPLACEABILITY	No loss	No loss of any resources
Irreplaceable loss of	Low	Marginal loss of resources

resources	Medium	<i>Significant loss of resources</i>
	High	<i>Complete loss of resources</i>

(f) Degree to which the impact can be mitigated

The degree to which an impact can be MITIGATED can be defined as: "the effect of mitigation measures on the impact and its degree of effectiveness".

MITIGATION RATING	MITIGATED Degree to which the impacts can be mitigated	High	<i>Impact 100% mitigated</i>
		Medium	<i>Impact >50% mitigated</i>
		Low	<i>Impact <50% mitigated</i>

(g) Confidence rating

CONFIDENCE in the assessment of an impact can be defined as the: "level of certainty of the impact occurring".

CONFIDENCE RATING	CONFIDENCE	Unsure	Amount of information on and/or understanding of the environmental factors the potentially influence the impact is <i>limited</i> .
		Sure	Amount of information on and/or understanding of the environmental factors the potentially influence the impact is <i>reasonable and relatively sound</i> .
		Certain	Amount of information on and/or understanding of the environmental factors the potentially influence the impact is <i>unlimited and sound</i> .

(h) Cumulative impacts

The effect of CUMULATIVE impacts can be described as: "the effect the combination of past, present and "reasonably foreseeable" future actions have on aspects".

CUMULATIVE RATING	CUMULATIVE EFFECTS	Low	<i>Minor cumulative effects</i>
		Medium	<i>Moderate cumulative effects</i>
		High	<i>Significant cumulative effects</i>

7.4.4 THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

The competent authority will be consulted during the:

- Scoping phase
- Public review of documents
- EIA phase and release of the EMP
- Further Consultation after the EIA/EMP has been submitted if there are comments from I&AP's

8 PUBLIC PARTICIPATION DURING THE EIA PHASE

8.1 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS WITH REGARD TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

Public participation is an essential and regulatory requirement for an environmental authorization process and is guided by Regulations promulgated under NEMA, specifically the EIA Regulations. NEMA EIA Regulations defines the “Public Participation Process” as a process in which potential interested and affected parties (I&APs) are given an opportunity to comment on, or raise issues relevant to, specific matters”.

The public participation process is designed to provide sufficient and accessible information to I &APs in an objective manner to assist them to:

DURING THE SCOPING PHASE:

- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been recorded;
- Assist in identifying reasonable alternatives; and
- Contribute relevant local information and traditional knowledge to the environmental assessment.

DURING THE IMPACT ASSESSMENT PHASE:

- Contribute relevant information and local and traditional knowledge to the environmental assessment;
- Verify that their issues have been considered in the environmental studies; and
- Comment on the findings of the environmental assessments.

The identified Interested and Affected Parties during the scoping phase will be made aware of the availability of the EIA report VIA

- A notification letter
- Emails and SMS
- Press advertisements
- Site Notices

- Public and stakeholder meetings
- The EIA will be made available for review to all IAPs for 30 days. All registered IAPs will be notified by email, fax, SMS, or post of the report's availability. Hard copies of the draft report will be placed at:
- Public Libraries, Municipal Offices and other accessible places.

8.2 DETAILS OF THE ENGAGEMENT PROCESS TO BE FOLLOWED

- In addition to land owners, other relevant organisations will be identified and notified of the application. This includes municipal and State departments with jurisdiction in the area and Non-Governmental Organisations (NGOs) with an interest;
- A notification letter with the details of the availability of the EIA will be distributed (by email, fax or post) to all land owners. All IAPs will be asked to distribute the documents to anyone who may be interested or affected by the project;
- Site Notices;
- Public and stakeholder meetings;
- Register of IAPs during the scoping report will be used to notify the availability of the EIA
- EIAR/EMPr will be released for public review for 30 days each excluding public and school holidays;
- Hard copies of the draft report will be placed at: Public Libraries, municipal offices and other accessible places;
- A final Consultation report with stakeholder comments from each phase will be submitted.

FRAMEWORK OF A STAKEHOLDER ENGAGEMENT PLAN

Regulations and requirements;

- Summary of previous engagement;
- Project stakeholders inclusive of an analysis and categorisation of all project stakeholders;
- Stakeholder engagement process inclusive of the regulatory process and separate engagement processes (i.e. with neighbouring facilities, or international NGOs);
- Timetable;
- Resources and responsibilities;

- Grievance mechanism;
- Key messages (code of conduct);
- Monitoring and reporting – i.e. comments and response tracking; and
- Management functions.

8.3 DESCRIPTION OF THE INFORMATION TO BE PROVIDED TO INTERESTED AND AFFECTED PARTIES

Once the competent authority has approved the SR, the Impact Assessment Phase will commence. Stakeholders will receive notification of the start of the Impact Assessment Phase and opportunities for public review and comment.

Public participation during the Impact Assessment Phase revolves around a review of the findings of the EIA, presented in the Draft EIA Report. This report will be made available for public comment for a period of 30 days.

Stakeholders will be invited to comment on the Draft EIA Report and EMP in the following ways:

- By completing a comment sheet made available together with the report at the public places, and by submitting additional written comments, by email or fax, or by telephone, to Sakal and Tebo the EAP's; and
- The Draft EIA Report and EMP Report and its accompanying Specialist Studies will be distributed for comment to public places in the project area, to everyone who requests a copy email.

The documents will contain a project location, map as well as detailed legislations triggered by the project and a project description as well as reference number of the project.

The scoping report will be made available to the public for review at public libraries. The scoping report will entail potential impacts, mitigation measures as well as specialist reports to be undertaken to supplement the background information of the proposed project.

8.4 DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN DURING THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The Environmental Impact Assessment Phase will include the following activities:

- 1) Undertake necessary specialist studies;
- 2) Assessment of environmental impacts;
- 3) Compilation of management plans;
- 4) Compilation of an EMP Amendment Report;
- 5) Stakeholder document review and comment;
- 6) Submission of Scoping and EIA report for decision-making

The EIA report must contain:

- A description of the property on which the activity is to be undertaken and the location of the activity on the property;
- A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity;
- Details of the public participation process conducted including
 - Steps undertaken in accordance with the plan of study;
 - A list of persons, organisations and organs of state that were registered as interested and affected parties;
 - A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and
 - Copies of any representations and comments received from registered interested and affected parties;
- A description of the need and desirability of the proposed activity;
- A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity;
- An indication of the methodology used in determining the significance of potential

environmental impacts;

- A description and comparative assessment of all alternatives identified during the environmental impact assessment process;
- A summary of the findings and recommendations of any specialist report or report on a specialized process;
- A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures;
- An assessment of each identified potentially significant impact, including:
 - Cumulative impacts;
 - The nature of the impact;
 - The extent and duration of the impact;
 - The probability of the impact occurring;
 - The degree to which the impact can be reversed;
 - The degree to which the impact may cause irreplaceable loss of resources; and
 - The degree to which the impact can be mitigated;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- An environmental impact statement which contains:
 - A summary of the key findings of the environmental impact assessment; and
 - A comparative assessment of the positive and negative implications of the proposed activity and identified alternatives;

A draft environmental management programme containing;

- Copies of any specialist reports and reports on specialised processes; and
- Any specific information that may be required by the competent authority

9 MITIGATION MEASURES

9.1 MEASURES TO AVOID, REVERSE, MITIGATE, OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED

Table 9-1: Mitigation Measures

POTENTIAL ENVIRONMENTAL IMPACTS & SOURCES	MEASURES TO PREVENT, MITIGATE, MINIMIZE OR MANAGE THE IMPACTS
CONSTRUCTION PHASE	
Activity: establishment/construction of camp site Impact: Air pollution (dust, gaseous emissions) Source: Establishment of camp site, movement of vehicles.	<ul style="list-style-type: none"> • Dust suppression measures such as spraying with water • Speed limits will be established and enforced • Equipment and vehicles equipped with standard exhaust systems which minimize the amount of emissions
Activity: food preparation Impact: Destruction of fauna and flora Source: Open fires	<ul style="list-style-type: none"> • Restrict open fires • Prohibit hunting and poaching • Collection of firewood will be prohibited • Maintain firebreaks
Activity: maintenance of vehicles Impact: Water pollution (surface water, groundwater) Source: spillages from vehicles	<ul style="list-style-type: none"> • Use oil trays • Use modern vehicles in good working condition • Take vehicles to accredited workshop in town • Use absorbents to trap hydrocarbons
Activity: Disposal of Waste Impact: Land degradation, land-use and capability Source: Poor waste management	<ul style="list-style-type: none"> • Place waste receptacles at strategic points • Monitor housekeeping behaviour and insist on corrective action • Waste will be disposed-off in approved site
Activity: establishment/construction of camp site Impact: Safety and security	<ul style="list-style-type: none"> • Employ locals who will be transported home after hours • Make necessary arrangements with the

POTENTIAL ENVIRONMENTAL IMPACTS & SOURCES	MEASURES TO PREVENT, MITIGATE, MINIMIZE OR MANAGE THE IMPACTS
Source: Employees	landowner for security measures, access to site and other logistical matters
OPERATIONAL PHASE	
Activity: Preparation of mining area Impact: Land degradation, land-use and capability Source: Poor waste management	<ul style="list-style-type: none"> Mined areas will be rehabilitated and re-vegetated Debris will be removed and disposed off in approved site Areas which do not form part of mining site will not be disturbed.
Activity: Disposal of Waste Impact: Land degradation, land-use and capability Source: Poor waste management	<ul style="list-style-type: none"> Place waste receptacles at strategic points Monitor housekeeping behaviour and insist on corrective action Waste will be disposed-off in approved site
Activity: mining and lubrication of equipment Impact: water pollution (surface water, groundwater) Source: leaks, spillages from equipment and vehicles	<ul style="list-style-type: none"> Operate outside 100 m distance from stream or any water body Control and manage storm water Prevent soil erosion and keep water channel clean, monitor groundwater
Activity: Vehicle movement during operational hours Impact: Ecological degradation Source: Uncontrolled vehicle movement and poor rehabilitation	<ul style="list-style-type: none"> Most of the biodiversity will be restored after closure Re-vegetation of the sites Movement of vehicles will be restricted to designated areas
Activity: Accidental spillages Impact: Land pollution Source: Lack of proper house keeping	<ul style="list-style-type: none"> Trays used to trap hydrocarbons Absorbent agents to be used to trap hydrocarbons and grease Any spillage will be recorded and remedial action

POTENTIAL ENVIRONMENTAL IMPACTS & SOURCES	MEASURES TO PREVENT, MITIGATE, MINIMIZE OR MANAGE THE IMPACTS
	<p>taken immediately</p> <ul style="list-style-type: none"> • Reporting of significant hazardous spillages
<p>Activity: Mining (opencast mine workings)</p> <p>Impact: Aesthetic pollution</p> <p>Source: visibility of site</p>	<ul style="list-style-type: none"> • Site selection to prioritize areas not to exposed to the public or local residences
<p>Activity: Establishment of tailings</p> <p>Impact: Land degradation</p> <p>Source: visibility of site</p>	<ul style="list-style-type: none"> • Backfilling in accordance with original soil profile • Sloping and levelling of land • Re-vegetation of the sites
<p>Activity: Establishment of pads</p> <p>Impact: Destruction of fauna and flora</p> <p>Source: visibility of site</p>	<ul style="list-style-type: none"> • Most of the biodiversity will be restored after closure • Re-vegetation of the sites • Re-introduction of local species where applicable
<p>Activity: Bulk Excavation</p> <p>Impact: Land degradation</p> <p>Source: visibility of site</p>	<ul style="list-style-type: none"> • Backfilling in accordance with original soil profile • Sloping and levelling of land • Re-vegetation of the sites
<p>Activity: Bulk sample</p> <p>Impact: Land degradation</p> <p>Source: visibility of site</p>	<ul style="list-style-type: none"> • Backfilling in accordance with original soil profile • Sloping and levelling of land • Re-vegetation of the sites
DECOMMISSIONING AND CLOSURE PHASE	
<p>Activity: establishment/construction of camp site</p> <p>Impact: Air pollution (dust, gaseous emissions)</p> <p>Source: movement of vehicles.</p>	<ul style="list-style-type: none"> • Speed limits will be established and enforced • Very temporary in nature
<p>Activity: De-establishment / removal of infrastructure</p> <p>Impact: Noise</p> <p>Source: vehicle movement</p>	<ul style="list-style-type: none"> • The operation will comply with the provisions of the Mine Health and Safety Act, 1996 (Act 29 of 1996) and its regulations as well as other applicable legislation regarding noise control • Employees will be equipped with ear plugs and

POTENTIAL ENVIRONMENTAL IMPACTS & SOURCES	MEASURES TO PREVENT, MITIGATE, MINIMIZE OR MANAGE THE IMPACTS
	other protective gear. All vehicles will be equipped with silencers and maintained in a roadworthy condition

9.2 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Additional consultation and studies might be requested by the relevant authorities.

9.2.1 IMPACT ON THE SOCIO-ECONOMIC CONDITIONS OF ANY DIRECTLY AFFECTED PERSON.

The socio-economic conditions will be identified and described in the Social Impact Assessment report. Preliminary it can be assumed that livelihoods of the adjacent landowners will be impacted by the infusion of capital into the area.

9.2.2 IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT.

There are human settlements in the vicinity of the study area. Therefore it may be assumed that the potential of existence of heritage resources is high.

In terms of the National Heritage Resources Act, 1999 (Act no. 25 of 1999) an Archaeological Impact Assessment will undertaken in order to establish if any localities of heritage significance are present on the property.

9.2.3 POTENTIAL CUMULATIVE IMPACT AND MITIGATION MEASURES

Table 9-2: Cumulative Impacts and Mitigation Measures

TRIGGERS	POTENTIAL CUMULATIVE IMPACT	SIGNI-FICANCE	MITIGATION AND MANAGEMENT MEASURES	SIGNI-FICANCE (with mitigation)
Use of hazardous substances (hydrocarbons), soil erosion	Contamination of water resources	Low	Avoidance of hazardous substances Prevention of spillages Proper house keeping Prevent soil erosion Concurrent rehabilitation	Low
Soil erosion	Reduction of land capability	High	Restriction on vehicular circulation Immediate rehabilitation of disturbed sites	Low
Loss of sense of place and serenity	Reduction of land land-use potential	High	Reduction of noise and visual aspects Immediate rehabilitation of disturbed sites	Low
Lack of supervision and site surveys	Loss of vegetation and land capability	Moderate	Use of existing roads and tracks. Limited vehicular movement Prospect in one area at a time to systematically open up access to other areas for rotational grazing and other land uses	Low
Improper use of machinery and	Generation of dust, smog and	Moderate	Maintenance of machinery and vehicles	Moderate

TRIGGERS	POTENTIAL CUMULATIVE IMPACT	SIGNIFICANCE	MITIGATION AND MANAGEMENT MEASURES	SIGNIFICANCE (with mitigation)
vehicles	noise		Operate within prescribed working hours	
Perception of job opportunities	Conflict between project team and the local community	Moderate	Employ local people, communicate the right messages about the project	Negligible

10 RECOMMENDATIONS

It is recommended that the applicant conducts the recommended specialist studies to assess that the risks that have been identified and that they can be mitigated. The scoping report should be approved and recommendations by commenting authorities will be considered in the EIA phase. The activity should be granted with the conditions that the applicant implements the recommendations that have been provided in the risk assessment report.

This conclusion assumes that Trizafield undertakes the mining as described and that the measures set out in the EMP are implemented in full.

10.1 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

DECLARATION OF INDEPENDENCE

I, Melvyn Mandla Masango, on behalf of Sakhal and Tobe Environmental (Pty) Ltd in my capacity as an environmental consultant, hereby declare that I:-

- ✚ Act as an independent consultant;
- ✚ Do not have any financial interest in the undertaking of this project, other than remuneration for the work performed in terms of the National Environmental Management Act EIA Regulations Amendment of April 2017;
- ✚ Have and will not have vested interest in the proposed activity nor will I engage myself in any conflicting interest associated with this project

- ✚ I undertake to disclose and provide to the competent authority any material or information at my disposal regarding this project as required in terms of National Environmental Management Act (EIA regulations of April 2017);
- ✚ Based on the information provided to me by the client and in addition to information obtained during the course of this study, I have presented the results and conclusion with regard to this project to the best of my professional ability;

I Melvyn Mandla Masango herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected parties has been correctly recorded in the report.



SIGNATURE OF THE EAP

DATE: 30 September 2021- Published Date

UNDERTAKING REGARDING LEVEL OF AGREEMENT

I Melvyn Mandla Masango herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and Affected Parties and stakeholders has been correctly recorded and reported herein.



SIGNATURE OF THE EAP

DATE: 30 September 2021

11 REFERENCES

Mucina, L. and Rutherford, M.C. (eds) 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.

Department of Environmental Affairs and Tourism. **2006** .*Guide to the Environmental Impact Assessment Regulations*. DEAT. South Africa.

Department of Environmental Affairs and Tourism. **2001**. *Environmental Potential Atlas*. DEAT, Pretoria.

Cowherd C., Muleski G.E. and Kinsey J.S., **1988**. Control of Open Fugitive Dust Sources, EPA-450/3-88-008, US Environmental Protection Agency, Research Triangle Park, North Carolina.

Cummins AB, Given IA, eds., **1973**. SME Mining engineering handbook, Vol. 1. New York: Society of Mining Engineers of the American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc.

DEAT, **2006**. Government Gazette, National Environmental Management Air Quality Act, 2004, No. 28899.

Department of Economic Development Environment and Tourism, OCTOBER 2013. PROVINCIAL AIR QUALITY MANAGEMENT PLAN

South African National Standards (SANS), 2011. South African National Standard, Ambient Air Quality – Limits for Common Pollutants. SANS 1929:2011. Standards South Africa, Pretoria.

Western Cape Department of Environmental Affairs & Development Planning (WC DEADP). Guideline on alternatives: EIA Guideline and Information Document Series. 2011.

Trizafield Mine Works Program, 2021, Sakal and Tebo (Pty) Ltd

ArcGIS Mapping software and SANBI database