ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

Mining Right Report on Portion 10 of the farm Graspan 222 IS, situated in the Msukaligwa Local Municipality within the District of Gert Sibande in the Mpumalanga Province.

PREPARED FOR

mineral resources
Department: Mineral Resources
REPUBLIC OF SOUTH AFRICA

APPLICANT

IBM & T

PREPARED BY

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DMR REF: (MP30/5/1/2/2/10190MR)

ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) FOR A MINING RIGHT ON PORTION 10 OF THE FARM GRASPAN 222 IS PROPERTIES TO BE KNOWN AS INCREADABLE BERACHOT MINING SITUATED IN THE MAGISTERIAL DISTRICT OF BARBERTON IN THE MPUMALANGA PROVINCE

REF NO: *MP 30/5/1/2/2/10190 MR*

APPLICANT: *INCREADABLE BERACHOT MINING AND TRADERS (PTY) LTD*

Compiled by: *SINGO CONSULTING (PTY) LTD*

DATE: 30 SEPTEMBER *2019*

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mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

FILE REFERENCE NUMBER SAMRAD: MP 30/5/1/2/2/10190MR

EIA REFERENCE NUMBER: MP 30/5/1/2/3/2/1(10190)EM

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File reference number (DMR)	MP 30/5/1/2/2/10190MR

30 SEPTEMBER 2019

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1. Important notice

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

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

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

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

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

2. Objective of the environmental impact process

a) Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context

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b) Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location

c) Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment

d) Determine the

   i. Nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives

   ii. Degree to which these impacts:

      aa. can be reversed

      bb. may cause irreplaceable loss of resources

      cc. can be avoided, managed or mitigated

e) Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment

f) Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity

g) Identify suitable measures to manage, avoid or mitigate identified impacts

h) Identify residual risks that need to be managed and monitored

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PART A – SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

a) Details of:

i. The EAP who prepared the report

Environmental Assessment Practitioner	Singo Consulting (Pty) Ltd
Contact person (s)	Senior: Kenneth Singo Junior 1: Rudzani Shonisani Junior 2: Siyabonga Mashigo Junior 3: Nokuthula Nkosi
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2 EXPERTISE OF THE EAP

2.1 The qualifications of the EAP

With evidence attached as appendices.

See Appendix 1 and Appendix 2.

2.2 Summary of EAP's past experience

Attach the EAP's curriculum vitae as an Appendix 2.

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3 DESCRIPTION OF THE PROPERTY

Farm name:	Portion 10 of the Farm Graspan 222 IS.
Application area (ha):	Approximately 346, 4648 ha
Magisterial district:	Gert Sibande
Distance and direction from nearest town:	The project area is approximately 53.8 km north-west from Ermelo, using the N11 to Middleburg, approximately 31, 2 km north-east of Bethal using R38 road to Hendrina and it is 16 km south-west of Hendrina.
21-Digit Surveyor General Code	T0IS00000000022200010

4 LOCALITY DESCRIPTION

Show nearest town, scale not smaller than 1:250000, attached as Appendix 3.

The mine is located near the towns of Hendrina, Bethal and Ermelo. There are roads near the mine, making the area accessible, and there are no observable powerlines or nature reserves in the vicinity. The hydrological map confirms that there are rivers close to the project area. The Increadable Berachot coal mining right area comprises approximately 346,4648 ha and the project area is approximately 53.8 km north-west from Ermelo, using the N11 to Middleburg, approximately 31,2 km north-east of Bethal using R38 road to Hendrina and it is 16 km south-west of Hendrina. The area is under the control of the Gert Sibande District Municipality and Msukaligwa Local Municipality, located in South Africa's Mpumalanga province.

See Figure 1, Figure 2, Figure 3 and Appendix 3 for the Increadable Berachot Mining and Traders (Pty) Ltd locality map.

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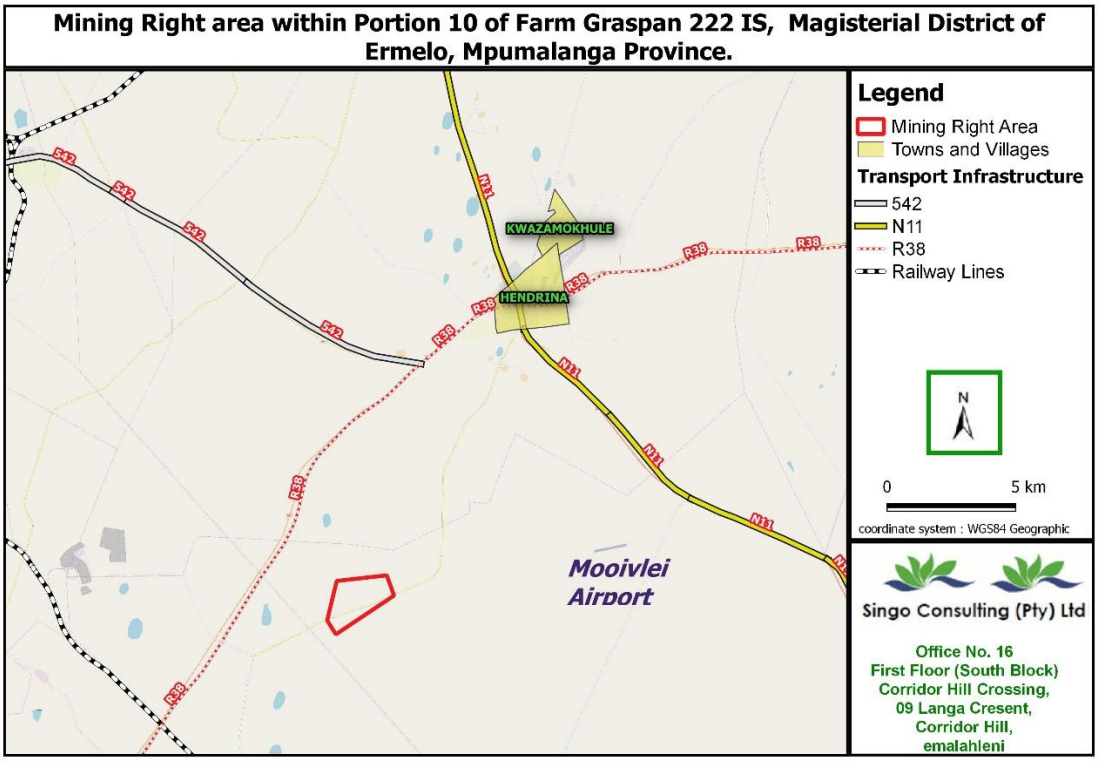

Figure 1: Locality map (A) of the area of interest

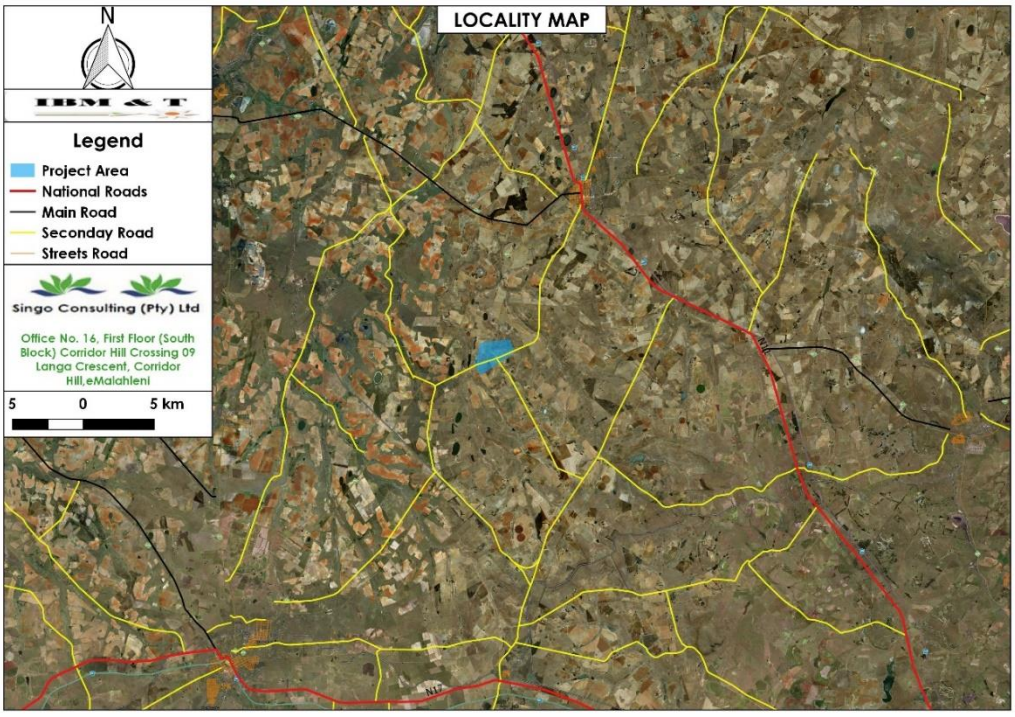

Figure 2: Locality map (B) of the area of interest

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The Graspan Coal Project is located in close proximity to actively operating coal mines such as Forzando Coal Mine, Sudor Coal Mine, Lumpasa Mining, Kwasa Mining, BHP Billiton Coal Mine, Umcebo Mining and Kleinfontein Colliery in close proximity with the project area. See Figure 3 below.

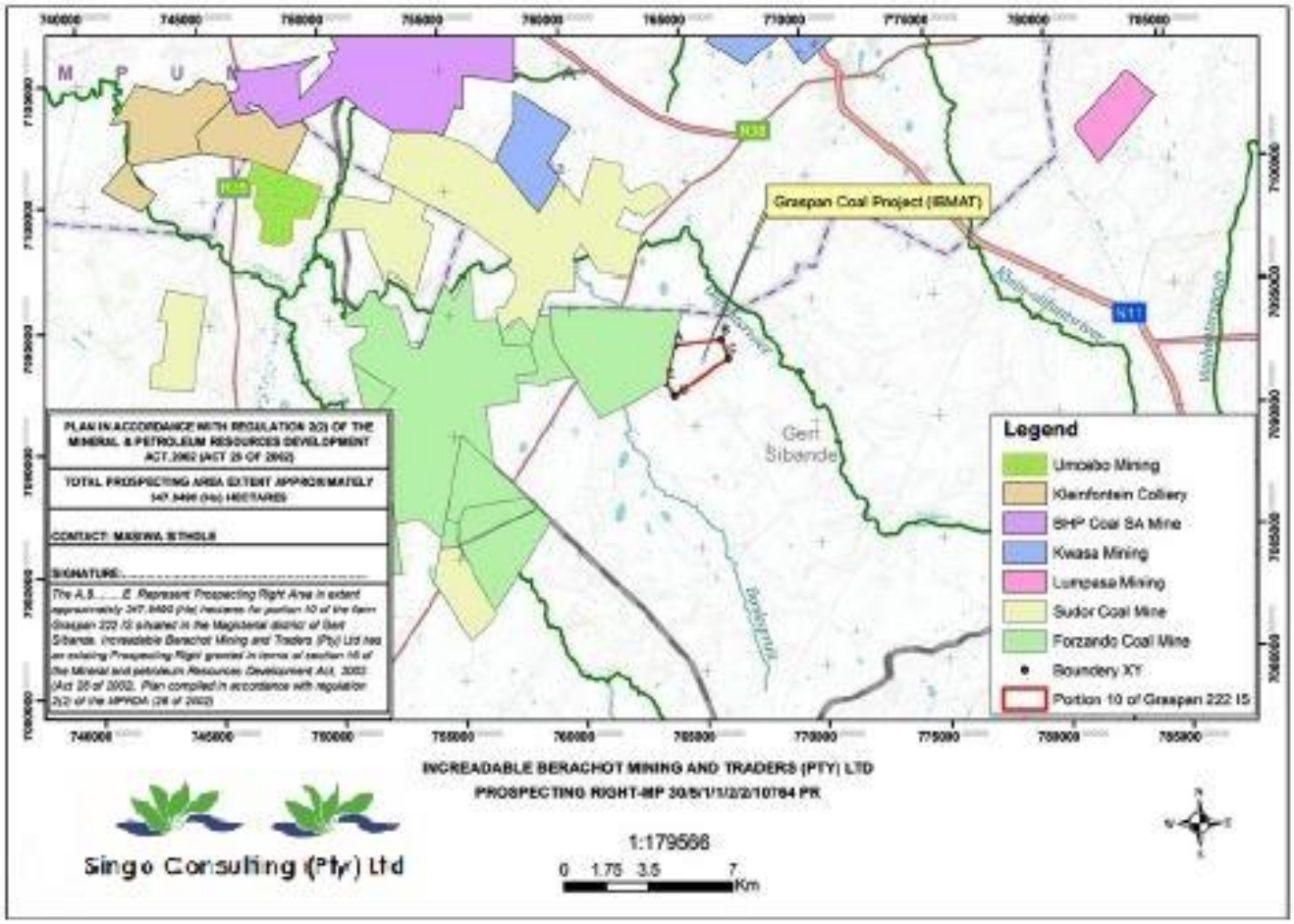

Figure 3: Project's neighbouring Prospecting rights area.

5 DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as Appendix 4. i).

Listed and specified activities. See Figure 4.

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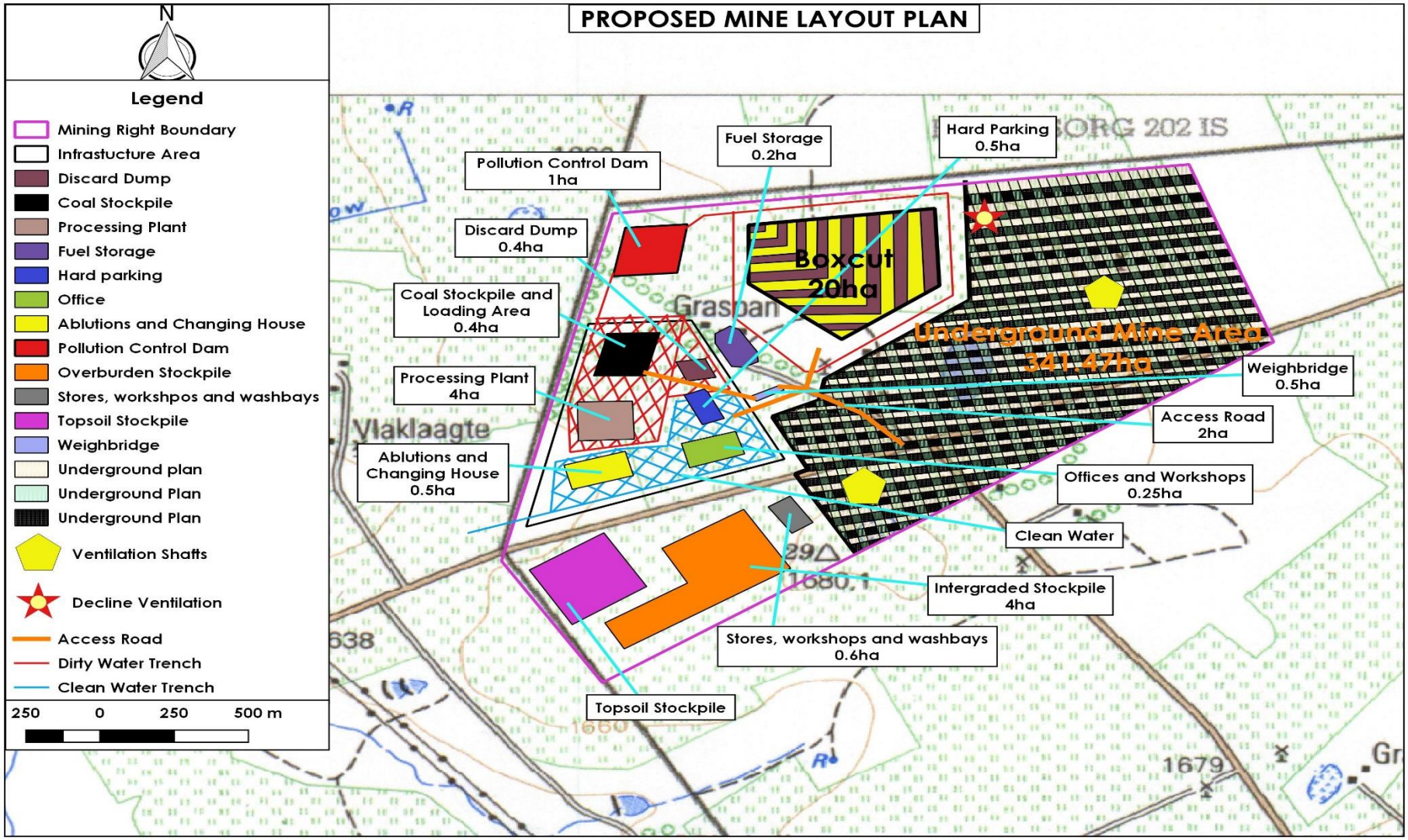

Figure 4: Surface and Underground mining layout.

6 SCOPE OF THE PROPOSED OVERALL AND SPECIFIED ACTIVITIES

Table 1 below lists the activities relevant to the proposed mine development.

Table 1: Listed activities and detailed description of activities

Name of activity	Aerial extent of the activity Ha or m² (from Google Earth Pro)	Listed activity	Applicable listing notice (GNR 544, GNR 545 or GNR 546)
Initial mine layout			
All infrastructure areas, development footprints and associated activities	Mineral boundary: 346, 4648 ha (As per Regulation 2.2 Map) Approximate area of surface disturbance: 34.35ha	X	GNR983, Activity 12 & 28 GNR984, Activity 15 GNR985, Activity 12 & 14
Boxcut excavation	20ha	X	GNR984, Activity 17
Blasting	Applicable to construction of boxcut only – 20ha		
Topsoil and subsoil stripping and stockpiling into berms	Maximum 20ha area		
Overburden stockpiles (non-carbonaceous)	2ha		
Overburden stockpiles (carbonaceous)	2ha	X	GNR984, Activity 6
decline Ventilation (1)	100m² each		
Ventilation shafts (x2)	100m² each		
Underground mining	Total underground mine area: 341, 47ha	X	GNR984, Activity 17

Name of activity	Aerial extent of the activity Ha or m² (from Google Earth Pro)	Listed activity	Applicable listing notice (GNR 544, GNR 545 or GNR 546)
RoM coal stockpiling	RoM feed: 0.4ha	X	GNR984, Activity 6
Dismantling of Processing Plant and other related structures (including associated conveyors and powerlines)	4.2ha	X	GNR983, Activity 22 GNR984, Activity 21
Coal product stockpile and loading area	Product coal: 0.4ha	X	GNR984, Activity 6
Coal testing laboratory	<0.5ha		
Access and hauling on roads with truck stops and weighbridges	2,500m x 10m	X	GNR983, Activity 24 GNR985, Activity 4
Water supply and storage (potable and process)	Process/service water: <0.5ha (1,068 m^3/day) Potable water: <0.5ha (32 m^3/day)	X	GNR984, Activity 6 GNR985, Activity 2
Mine water storage (PCD) and associated pipelines and pumps	PCD: 1ha Pipelines <1,000m	X	GNR984, Activity 6
Storm water runoff management features (Clean and Dirty water trenches)	0.13ha		GNR984, Activity 6
Explosives magazine	0.5ha		
Waste generation and storage	0.4 ha		
Stores, workshops and washbays	0.6ha		
Fuel storage	0.2ha	X	GNR985, Activity 10
Hard park	0.5ha		

Name of activity	Aerial extent of the activity Ha or m² (from Google Earth Pro)	Listed activity	Applicable listing notice (GNR 544, GNR 545 or GNR 546)
Ablutions and change house with two sewage treatment plants	0.5ha	X	GNR984, Activity 6
Offices and workshop area (O&AM) with parkade	0.25ha		
Electricity Powerlines	0.2ha	X	GNR983, Activity 11
Integrated Discarded slurry dump	0.4ha		GNR984, Activity 6 GNR921, Activity B (7), B (10) & B (11)
Rehabilitation, including backfilling of boxcut adit	34.35ha		GNR983, Activity 22 GNR921, Activity B(7) GNR921, Activity A (14)

6.1 NEMA listing notices

List the activities relevant to the proposed mine development.

Table 2: Listed activities and detailed description of activities

ACTIVITY NAME (all activities, including those not listed) (E.g. Excavations, blasting, stockpiles, Discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors,	AERIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE GNR 983 as amended, GNR 984 as amended or GNR 985 as amended
Storm water management structures, pipelines, berms and water resources diversions	Included in the overall of the Surface & underground mining areas	X	Listing notice 1-(9)
Access and haul roads	2ha	X	Listing notice 1-(24 ii)
Pipelines	1ha	X	Listing notice 1-(9) i & ii
Overland conveyor	26km	X	Listing Notice 1- (12) xii Listing Notice 3 (14)
Sewage treatment	0.5ha	X	Listing notice 1-(10) (i & ii)
Bulk hydrocarbon storage facilities/filling station	0.5ha	X	Listing Notice 1-(14) Listing Notice 2-(4)
Shaft development	5ha	X	Listing Notice 2 (17)
Mining of coal by underground mining	341.47ha	X	Listing notice 2-(17)
Crushing and screening of coal underground	0.5 ha	X	Listing notice 2- (21)
All infrastructure Including external parking, security and weighbridge, truck loading area, internal parking, silos, stockpiles, sewage treatment plant, scrap yard, offices, crusher and screen plant, medical facility, stores, raw water dam, storage yard and the ventilation shaft	34.35ha	X	Listing notice 1-(27)

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ACTIVITY NAME (all activities, including those not listed) (E.g. Excavations, blasting, stockpiles, Discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors,	AERIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE GNR 983 as amended, GNR 984 as amended or GNR 985 as amended
Sub-station and power line	0.2ha	X	Listing notice 1-(11)

6.2 NEMWA listing notices

ACTIVITY NAME (all activities, including activities not listed) (E.g. excavations, blasting, stockpiles, Discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors	AERIAL EXTENT OF ACTIVITY Ha or m²	LISTED ACTIVITY Mark with an "X" where applicable/affected	APPLICABLE LISTING NOTICE GNR 921 of the NEM:WA 59 of 2008
Residue stockpiles or deposit areas Mining, exploration or production operation, resulting in the development of residue stockpiles and residue deposits. Prospecting, mining, exploration or production operation, resulting in development of residue stockpiles and residue deposits. The management and control of these wastes must take place in accordance with the regulations for management and control of residue deposits and residue stockpiles or an integrated environmental authorisation as provided for in terms of NEMA.	Included in the infrastructure area of the mine 5 ha	X	Category B; Listing 7, 9, 10, 11

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<u>Waste:</u> Waste stockpiles will contain all the waste products from the mine workings. Waste stockpiles are indicated in the list of waste activities published in the GN. No. R. 632 of 24 July 2015 in accordance with the National Environmental Management: Waste Act 59 of 2008. One of the activities which guides the waste stockpiles is; Activity 17 of GN.R. 984: "Any activity which requires a mining right as contemplated in section 22 of the Mineral Resources and Petroleum Development Act (MPRDA), 2002 (Act no. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA." The applicable waste management activity (Category A activity 1 and Category B listed activity 11 of GN.R. 633) relates to residue stockpiles associated with the mining of the coal mineral, covering an extend of not more than 355 ha, on the property mentioned. It also include the construction of PCD to contain the "dirty" storm water runoff and also a Discard dump to contain waste.	Discard dump and PCD (total:1.4ha)		Activity 17 of GN.R. 984

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Planned activities for Graspan Mine.

No.		Description	Graspan Mine Activities	Rates	Unit
1		Dismantling of processing plant and related structures (including overland conveyors and powerlines)	processing plant, powerlines, conveyor.	42000m2=8607438,6434m3	m3
2 (A)		Demolition of steel buildings and structures	weighbridge, PCD,Procesing Plant, Stores, Worsjops and Washbays	6.1ha=61000m2	m2
2(B)		Demolition of reinforced concrete buildings and structures	All proposed mine layout plan activities excluding Boxcut.	41.35ha=413500m2	m2
3		Rehabilitation of access roads	Acces road	2ha=20000m2	m2
4 (A)		Demolition and rehabilitation of electrified railway lines	powerlines	0.2ha=2000m	m
4 (A)		Demolition and rehabilitation of non-electrified railway lines			m
5		Demolition of housing and/or administration facilities	Abulutions and chnaging house, worshops and offices	0.75ha=7500m2	m2
6		Opencast rehabilitation including final voids and ramps	Box cut	20ha	ha
7		Sealing of shafts adits and inclines	ventilation shafts (Decline)x2	200m2=2828.4271m3	m3
8 (A)		Rehabilitation of overburden and spoils			ha
8 (B)		Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)	intergarted stockpiles and access road	6ha	ha
8 (C)		Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	PCD and dirty water trenches	4ha+ 0.08ha=4.08ha	ha
9		Rehabilitation of subsided areas			ha
10		General surface rehabilitation	All proposed mine layout plan activities with Boxcut and excluding undsegound mineg area.	34.35ha	ha
11		River diversions			ha
12		Fencing	extent of the area required for mining	346.4648ha	ha
13		Water management	PCD and water trenches	4ha+0.13ha=4.13ha	ha
14		2 to 3 years of maintenance and aftercare	extent of the area required for mining	346.4648ha	ha
15 (A)		Specialist study			Sum
15 (B)		Specialist study			Sum

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6.3 Description of the activities to be undertaken

Describe methodology or technology to be employed, and for linear activity, a description of the route of the activity.

The proposed Increadable Berachot Mining and Traders (Pty) Ltd ("Graspan Mine") mining project will be located on the Portion 10 of farm Graspan, as described in section 4 above; mining will take the form of surface mining that will transform into underground mining. Increadable Berachot Mining and Traders (Pty) Ltd is currently the prospecting holder of the area and has decided to apply for a mining right in the same area. It is anticipated that Grapan colliery will operate 24/7 and lighting will be required on site. Life of mine (LoM) (is 15 years for CPR) as compared to its estimated thirty (30) years of the application.

6.3.1 General Overall Mining Plan

Mining will commence as surface and will be in the form of box cut which will transforms into an underground mining process. The boxcut, plant and associated mine infrastructure will be located on portion 10 of the Farm Graspan 222 IS (Figure 3). In the planned underground section, no disturbance is expected to occur with the exception of one access ventilation and two ventilation shafts.

The boxcut will be excavated to the coal seam level which is seam C as per the CPR and resource estimation results. Topsoil and subsoil will be excavated separately and utilised to create upstream, clean water diversion berms. Excess material will be placed in dedicated topsoil and subsoil stockpiles which will have top and toe perimeter berms in place, and vegetated. The overburden will be placed in a dedicated overburden stockpile near the boxcut adit.

The coal within the boxcut will be excavated and placed in the ROM coal stockpile area. A production rate of 1.8 million tons/annum of ROM will be mined and the ROM stockpile area will cater for approximately 13 000 tons of coal at any one point. At this point underground adits and access will be developed, and the necessary underground infrastructure installed, including the conveyors, ventilation, sump and water pipelines and pumps.

Coal will be transferred from the underground to surface by means of a conveyor belt and placed in a dedicated ROM coal stockpile area (13,000 tonne capacity).

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6.3.2 Planning phase

This phase includes detailed designs of the proposed mining operation and the updating of various plans, such as social labour plan and mine work programme which have been approved by the DMR in 2018. A full Environmental Impact Assessment (EIA) and scoping process is also included in this phase. At this phase, Increadable Berachot Mining and Traders (Pty) Ltd has already put in place a lease application with the department of public works which in this case is the landowner for the affected portion in terms of the socio-economic impact, land use and direct impact of the mine on them and the application procedures are enclosed on the consultation report on appendix 24.

6.3.3 Construction phase

The construction phase will commence with opencast mining, before switching to underground mining. Underground access will be granted through a boxcut. The boxcut, plant and associated mine infrastructure will be located on the remaining extent of Graspan 222 IS on Portion 10, with the exception of two ventilation shafts disturbing minor parts of the portions. The boxcut will be excavated to the coal seam level. Topsoil and subsoil will be excavated separately and utilised to create upstream, clean water diversion berms. Excess material will be placed in dedicated topsoil and subsoil stockpiles, which will have vegetation, as well as top and toe perimeter berms in place. The overburden will be placed in a dedicated overburden stockpile near the boxcut adit.

The required facilities and infrastructure must be established to allow for the transformation to underground mining activities. The construction activities will form part of the project's mining (operational) phase and will include construction of the service and access roads, excavations and construction of water management structures, structures in the infrastructure area, and all shafts (including the decline and ventilation shafts).

6.3.4 Operational phase

The proposed coal mining will be conducted using the box-cut to decline method. Open cast mining involves the extraction of coal from a pit developed from the earth's surface. The pit at the site will be worked by cutting a bench, which will be progressed in a north-easterly direction. The proposed opencast method will be mined in conventional truck and shovel method. Sustainable development applied to mining works necessarily includes rehabilitation with the aim of either restoring the land to its original use. The primary procedure will be implemented during the mining process include: Removing and stockpiling of topsoil, trenching around the mining footprint to ensure storm water is diverted away from the open cast pit,

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Blasting, stripping and stockpiling of overburden, Excavation of the initial strip of the box cut, Excavation of the coal ROM and backfilling rehabilitation concurrently as mine progress forward. Blasting with explosives to loosen the hard rock (overburden), will be used when necessary. If ever there is flying rocks blasting practices require some movement of rock to facilitate the excavation process. The extent of movement is dependent on the scale and type of operation. For example, blasting activities at large coal mines are designed to cast the blasted material over a greater distance than in quarries or hard rock operations. The movement should be in the direction of the free face, and therefore the orientation of the blast is important. Material or elements travelling outside of this expected range Fly rock can be categorised as follows:

• Throw - the planned forward movement of rock fragments that form the muck pile within the blast zone;

• Fly rock - the undesired propulsion of rock fragments through the air or along the ground beyond the blast zone by the force of the explosion that is contained within the blast clearance (exclusion) zone. When using this definition, fly rock, while undesirable, is only a safety hazard if a breach of the blast clearance (exclusion) zone occurs; and

• Wild fly rock - the unexpected propulsion of rock fragments that travels beyond the blast clearance (exclusion) zone when there is some abnormality in a blast or a rock mass which shows schematic of fly rock definitions. Fly rock from blasting can result under the following conditions:

• When burdens are too small, rock elements can be propelled out of the free face area of the blast;

• When burdens are too large and movement of blast material is restricted and stemming length is not correct, rock elements can be forced upwards creating a crater forming fly rock; and

• If the stemming material is of poor quality or too little stemming material is applied, the stemming is ejected out of the blast hole, which can result in fly rock. Certain mitigation will be implemented such as; relocating people to 200m away from the activity area and a full PPE must be adhered to(Refer to the enclosed blasting specialist report in appendix 13.The material will be loaded with excavators and hauled to the mobile crushing and screening plants that will be established within the mining area boundaries. The coal will be stockpiled and transported to clients via trucks and trailers. All activities will be contained within the mining site boundaries. See examples in Figure 5(A,B,& C) and Figure 6.

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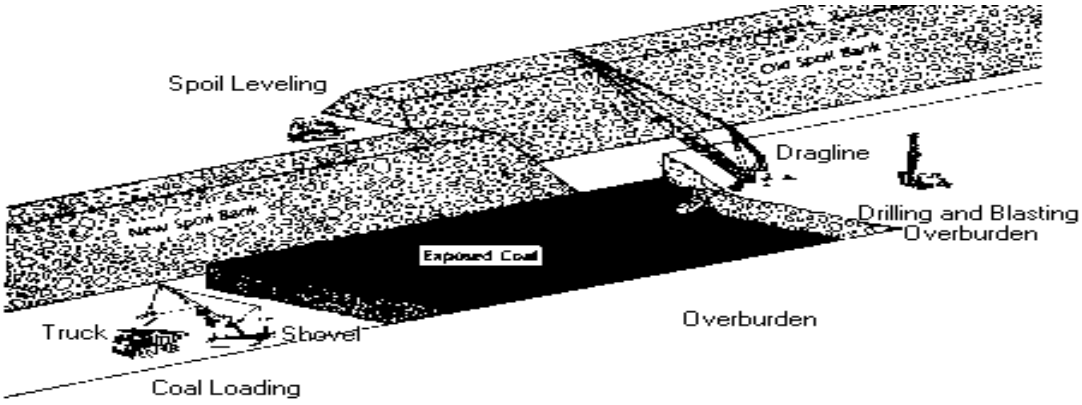

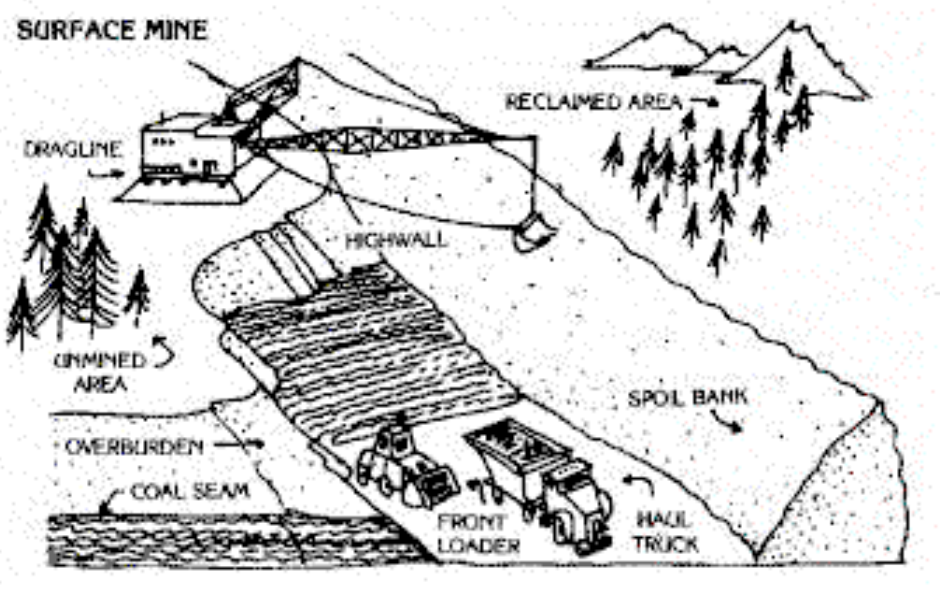

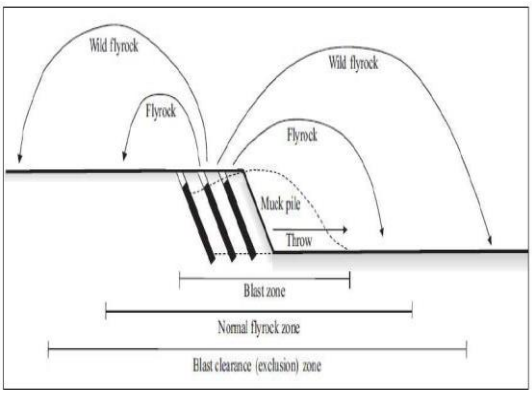

Figure 5 (A, B & C): Surface area mining and blasting examples

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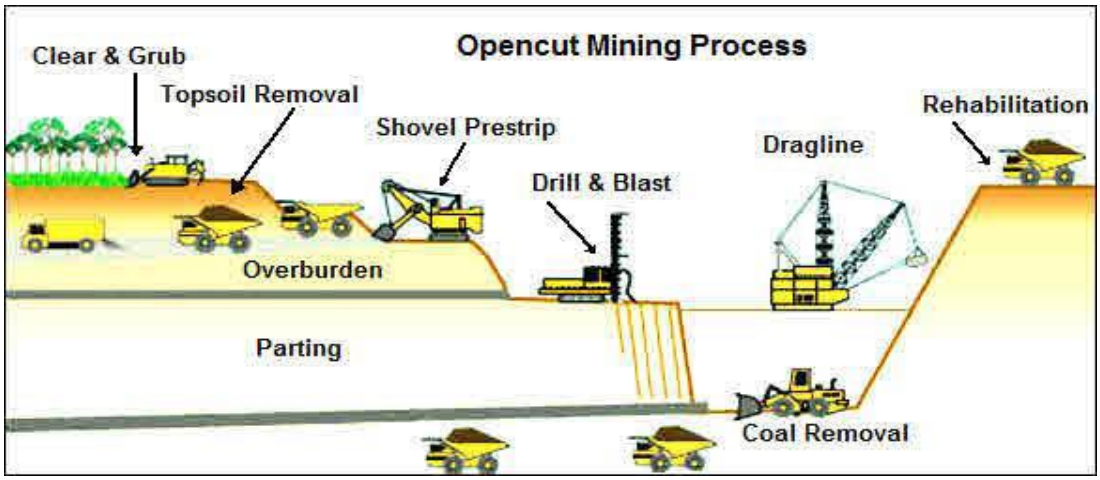

Figure 6: Opencast mining process

The twin decline shafts will comprise two parallel shafts: one dedicated to personnel and material movement, and one dedicated to coal conveying. Initially, these will be the up and down-cast ventilation tunnels for the mine. Up-cast raise bore ventilation shafts will be developed once required, then the two declines will be downcast. Raise bore ventilation holes will be developed as part of on-going capital as mining progresses.

Bord-and-pillar mining is proposed for dipping coal seams. This entails the mining of rooms (bords) leaving pillars intact as a primary support for the immediate roof. Secondary support, in the form of roof bolts and any other support means, will be used when required (in the immediate roof of the bords mined). The width of the pillars to be left intact is dictated by the following:

- Depth below surface
- Immediate roof competency (inputs from a geotechnical specialist)
- Mining height
- Bord width

To ensure optimal resource extraction, pillars left behind could be partially extracted towards the end of a panel being mined or towards the end of the LoM, as per specialised geotechnical guidelines. Due to the thickness of the parting between the three seams designated for mining, the three seams cannot be mined at once. This implies that the layout of the lower seam must be as close as practically possible to that of the upper seam. This layout will depend on specialised recommendations from a geotechnical engineer (after further studies have been conducted) and will mainly rely on the thickness and the competency of the partings. Figure 7, Figure 8 and Figure 9 illustrate a typical bord-and-pillar layout.

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Coal will be extracted through a mechanised mining method. This entails a mining cycle of cutting and loading the coal using a continuous miner and supporting the roof. Coal will be conveyed with electrical shuttle cars to a feeder breaker from where it will be crushed and conveyed to the processing plant.

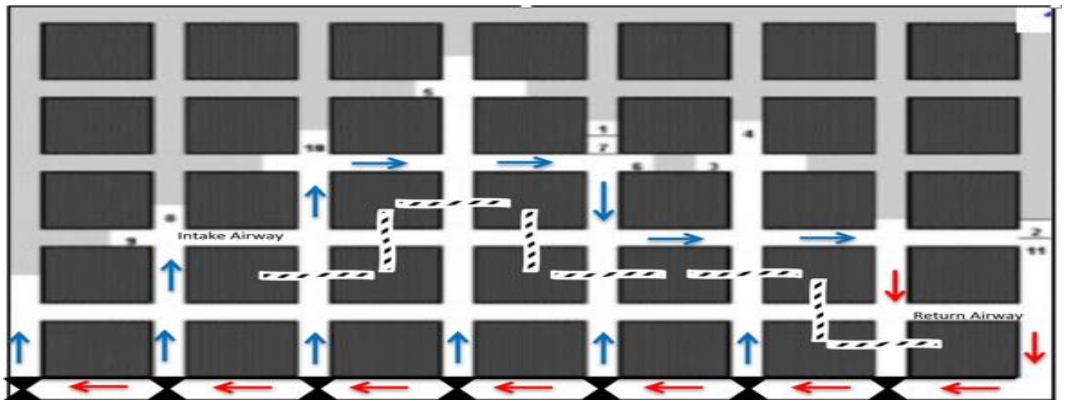

Figure 7: Typical bord-and-pillar layout

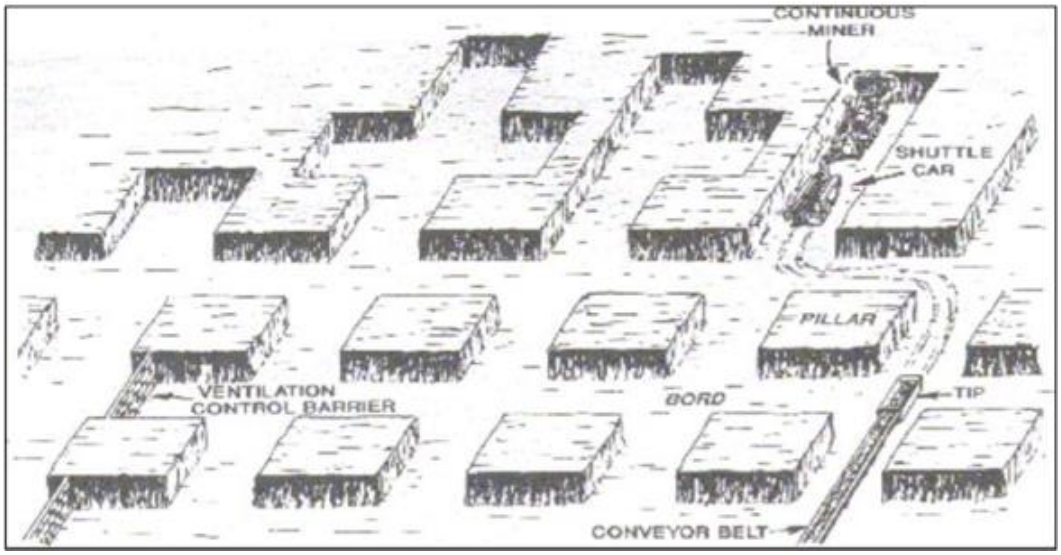

Figure 8: Typical bord-and-pillar layout (Wells et al., 1992)

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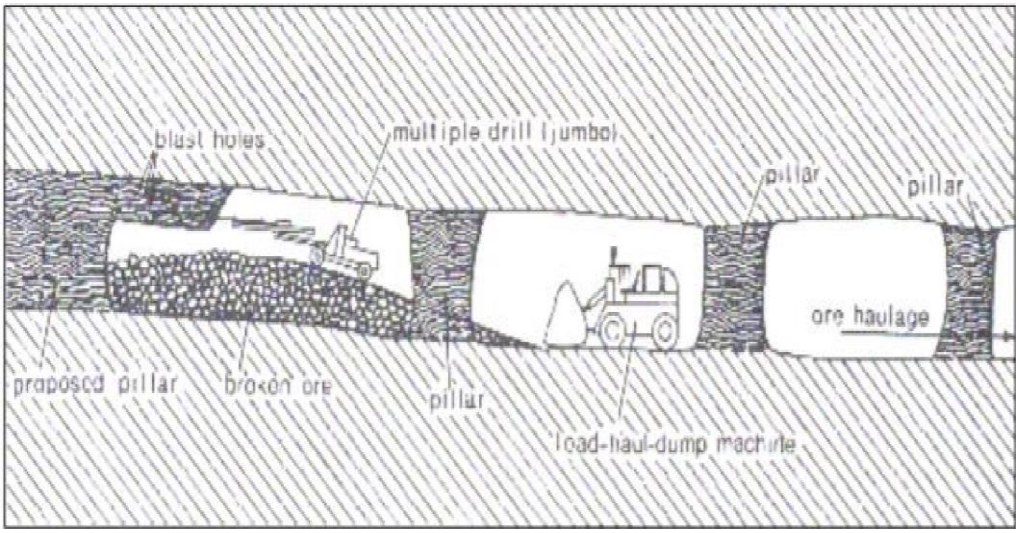

Figure 9: Cross section of typical bord-and-pillar layout (Source: Scoble, 1993)

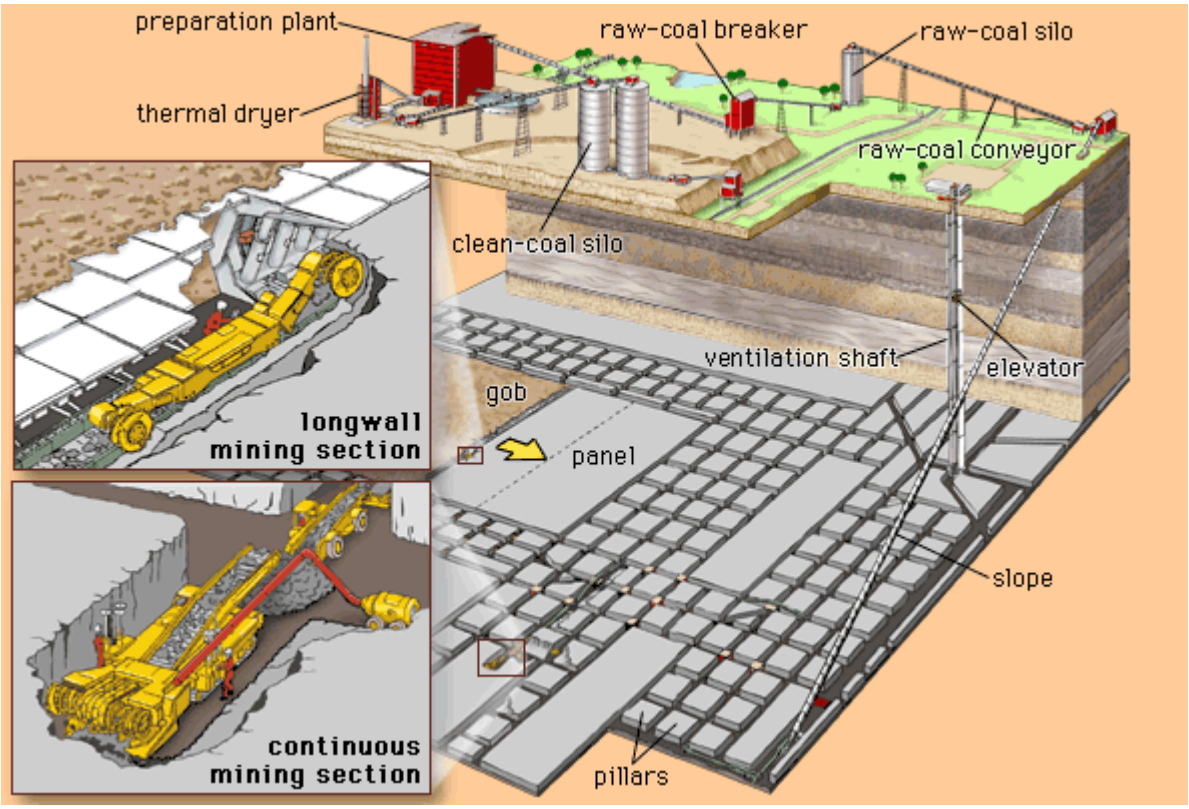

Figure 10: Typical example of underground mining methods.

6.3.5 Mine design parameters

According to the available information, a mine design criterion ("MDC") was developed and compiled from first principles. It is recommended that thorough input parameters be obtained from a qualified geotechnical rock engineer, by conducting further detailed studies.

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The practical design width for three adits is 70m wide, which incorporates an average of 5.5m (high) by 6.5m (wide) bords and pillars, depending on the depth. Factors influencing the panel pillar dimensions and safety factor are the depth below surface and the mining height. At this stage, these dimensions are benchmarked with similar commodity operations and apply Solomon's Squad Pillar formula.

6.3.6 Panel bord-and-pillar dimensions

Based on the aforementioned principles, the recommended bord-and-pillar widths at depth below surface are illustrated in Table 3.

Table 3: Panel bord-and-pillar dimensions

Production panels		
Depth below surface (m)	Actual pillar width (m)	Bord width (m)
0-80	8.5 x 8.5	6.5
80-150	11.5 x 11.5	6.5
Main headings		
Depth below surface (m)	Actual pillar width (m)	Bord width (m)
0-80	8.5 x 38.5	6.5
80-150	11.5 x 38.5	6.5

With the design, pillars are increased at 100m increments at depth below surface. The practical dimensions of bords and pillars are illustrated in Table 4.

Table 4: Depth below surface vs. extraction ratio vs. pillar sizes

	Extraction (in mining production area)	Extraction (including barrier pillars)
Production panels <80m deep	68%	63%
Production panels ≥80m deep	59%	55%
Main headings <80m deep	52%	40-50%
Main headings ≥80m deep	45%	

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6.3.7 Equipment needed

Table 5 illustrates the equipment fleet recommended for the Graspan mine, surface mining that will later change to underground mining. The project will incorporate primary, secondary and tertiary equipment.

Table 5: Basic equipment fleet

Surface equipment	
Equipment impacting on fuel and electricity cost	Fleet requirement
Komatsu D115 Bulldozer	1
Volvo 460 Hydraulic Excavators	2
Volvo A30 Articulated 6X6 Dump trucks	6
Komatsu D65 Bulldozer	1
Volvo 72 Motor Grader	1
12000L Water Bowsers	1
Mobile Percussion Drill Rig	1
Service Truck	1
Weigh bridge	1
Ablution	10
Drilling equipment	2
Primary equipment	Fleet requirement
Continuous miner	6
Shuttle cars	16
Feeder breakers	6
Fletcher roofbolters	6
Secondary and tertiary equipment	Fleet requirement
Blower fan	7
LDV 4x4	13
Underground people carrier	3
Genies	2
Underground pump station	6
Bob-cat	2
Section fan	9
Surface vent fan	4

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6.3.8 Mine estimated resource

The exploration activities successfully conducted by Tshifcor on behalf of IBMT (Incredable Barachot Mining and Traders (Pty) Ltd at the Graspan mine consists a comprehensive desktop study, diamond core drilling and sampling. The above field activities were designed with the sole purpose of obtaining enough geological information to aid decision making and were concentrated on intersecting the five distinctive coal seams, A-Seam, B-Seam, C-Seam, D-Seam and E-Seam at portion 10 of the Graspan Farm (number 222 IS). The mentioned seams which were discovered are fully described below;

E-Seam

E-Seam in the project area was intersected within borehole GPD001 (at a depth of 117 m) and at borehole locality GPD005 (131.92 m). The current seam was only developed as bright bands subdivided in sequences with inter-layer of sandstone and silt as shown in **Figure 11.**

Figure 11: Borehole core photos showing D&E Seam in the project area.

D-Seam

The D-Seam in the project area was only intersected at a depth of 113 m at an average thickness of 0.16 m with a carbonaceous silt at the footwall. The current seam is only developed or intersected at borehole localities, GPD001 and GPD005 in the project area as shown in **Figure 11** above.

C-Seam

The C-Seam (CL) ranges in thickness from 1.8m to 3 m across the project area **Figure 12**. This Seam (CL) is well developed and intersected in all fourteen (14) boreholes from a minimum depth of 49.79m to a maximum depth of 104.59m. The coal seam has an average thickness of 2.8 m and is generally observed to be the CL seams in all the fourteen (14) boreholes. The CL Seams is well-developed in the project area than

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the CU and has a sandstone parting (wash-off) in the project area **Figure 12**. The CL-Seam is shallower towards the north-eastern corner of the project area as shown in **Figure 14** and **Figure 15.**

Figure 12: Borehole core photos showing C-Seam in the project area.

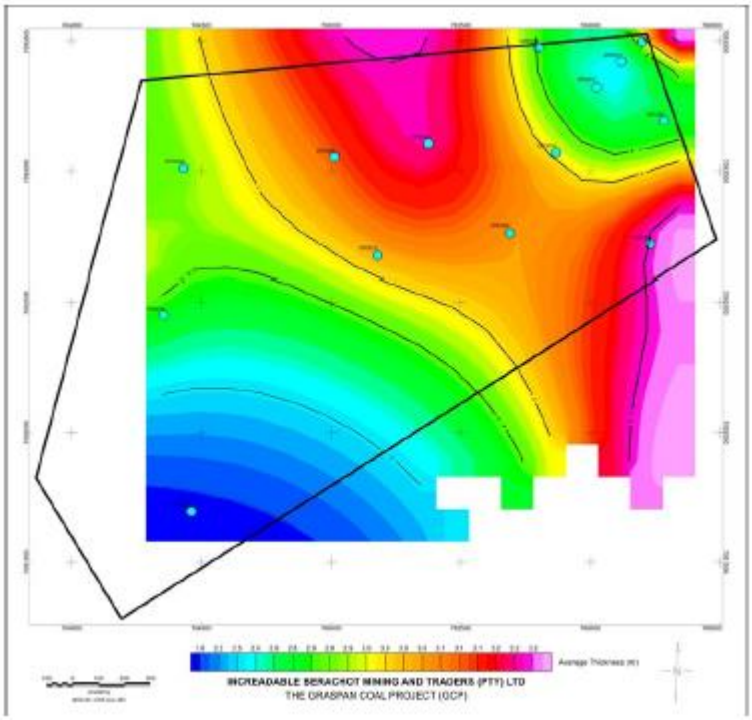

Figure 13: CL-Seam average thickness in the project area.

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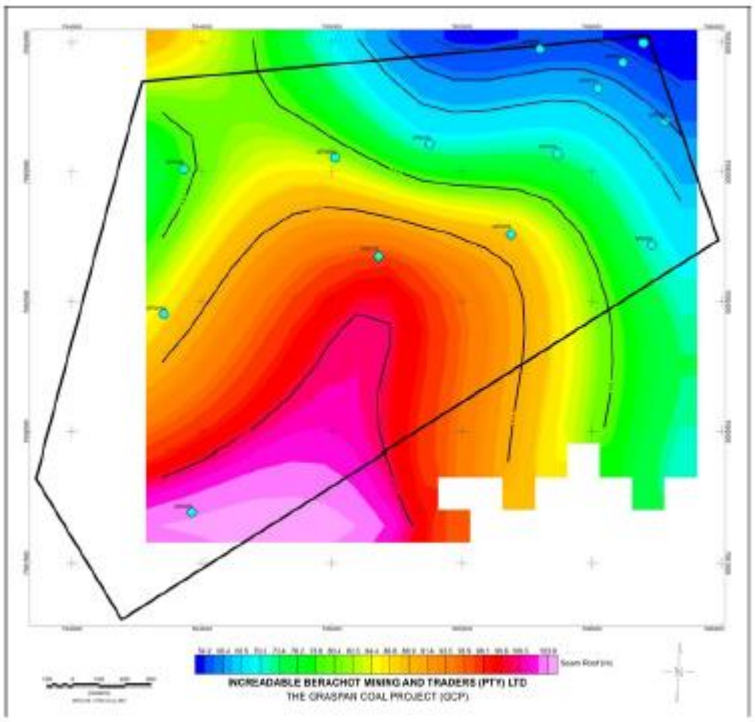

Figure 14: CL-Seam average coal roof in the project area.

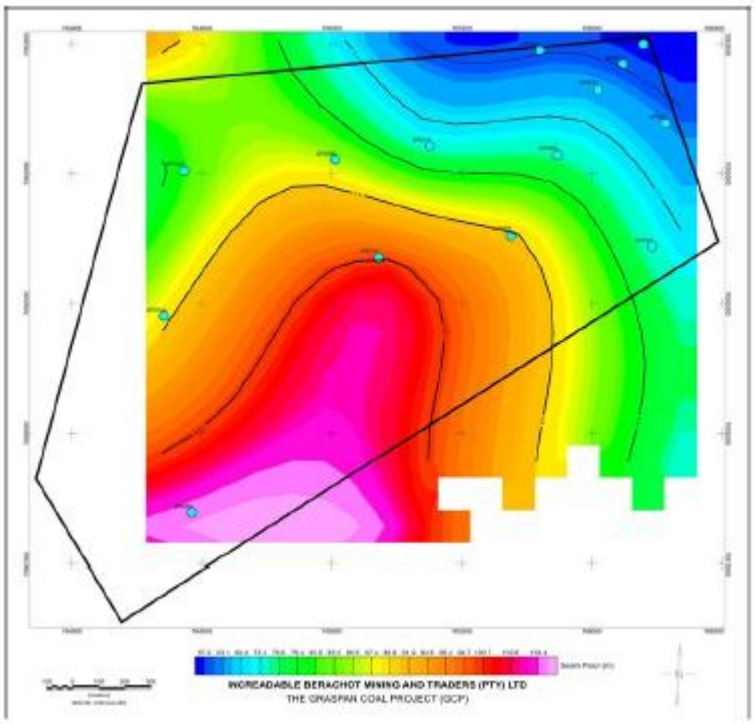

Figure 15: CL-Seam average coal Floor in the project area.

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B-Seam

The B-Seam in the project area is well developed and intersected in all the fourteen (14) holes drilled on the property, from a minimum depth of 20 m to a maximum depth of 89.55 m. The average thickness of the seam is approximately 0.71 m from all the fourteen (14) boreholes in the project area. The current seam was also split into two in the project area namely B-Seam and B1-Seam. The B1-Seam was only intersected at two borehole localities, namely GPD004 and GPD005 (**Figure 16**).

Figure 16: Borehole core photos showing B-Seam in the project area.

A-Seam

The A-Seam was intersected in only five boreholes drilled on the project, namely GPD002, GPD010, GPD012, GPD013 and GPD014 from a minimum depth of 18.65 m to a maximum depth of 47.05 m. The average thickness of the seam is approximately 0.63 m for the five (5) boreholes drilled at the Graspan Coal Project (GCP). The above mentioned five (5) boreholes were collared at higher topography as compared to other boreholes **Figure 17.**

Figure 17: Borehole core photos showing A-Seam intersection in the project area.

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6.3.9.1 Laboratory Analyses

Laboratory analuses were done in 2014 and 2017 for Tshifcor, samples were sent to Bureau Veritas laboratory in Pretoria and Umzamo Analytical Services laboratory in Witbank for analyses by Tshifcor.

For each sample, the following tests or analyses were performed:

- The raw relative density (RD) was determined;
- The sample was conditioned to eliminate all surface moisture;
- The sample was screened and divided into –0.5mm and +0.5/-25mm fractions;
- Proximate analysis = equilibrium inherent moisture (IM) content, ash content, volatile matter (VM) content and fixed carbon (FC) (by difference) on each sample portion;
- CV (heat value) and total sulphur (TS) content determination on each sample portion;
- Calculation of reconstituted raw coal values for total sample.
- Wash-ability on fraction (F1.40 – S1.85) at 0.05 intervals: Proximate, Calorific Value and Total Sulphur.

6.4 Resource Estimation

After the completion of the Phase two drilling, Tshifcor was tasked by IBMT (Increadable Barachot Mining and Traders (Pty) Ltd) to create a geological model and Coal Resource estimation for the Graspan Coal Project (GCP).

A total of 14 boreholes collared on portion 10 of the Graspan Farm (number 222 IS) were used for the structural model, four (4) of which were drilled in late 2014. In addition to this, ten (10) boreholes were drilled in 2017 used for to improve the structural and resource model. In preparation for the geological model the database was compiled and validated, these being a collar, lithology, raw quality and wash product quality database. The newly compiled database also contains a column for the stratigraphic identification of the coal seams and other geological units on which the model is based, such as the Granite basement, Dwyka Group rocks, and dolerite intrusions. In addition, the level of weathering and depth of soft overburden were identified where possible.

Modelling of the Graspan Coal Project was undertaken using Data mine Studio 3 and included the generation of wireframes of the level of weathering, of the major coal seams and dolerite intrusions. This was followed by geological interpretation, specifically focused on the structure and the relationship between the dolerite intrusions and their effect on the coal seams. A number of cross-sections were

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generated to test the geological model (Figure 18) and to gain a better understanding of the changes in the seam floor elevations in order to see where faults potentially occur.

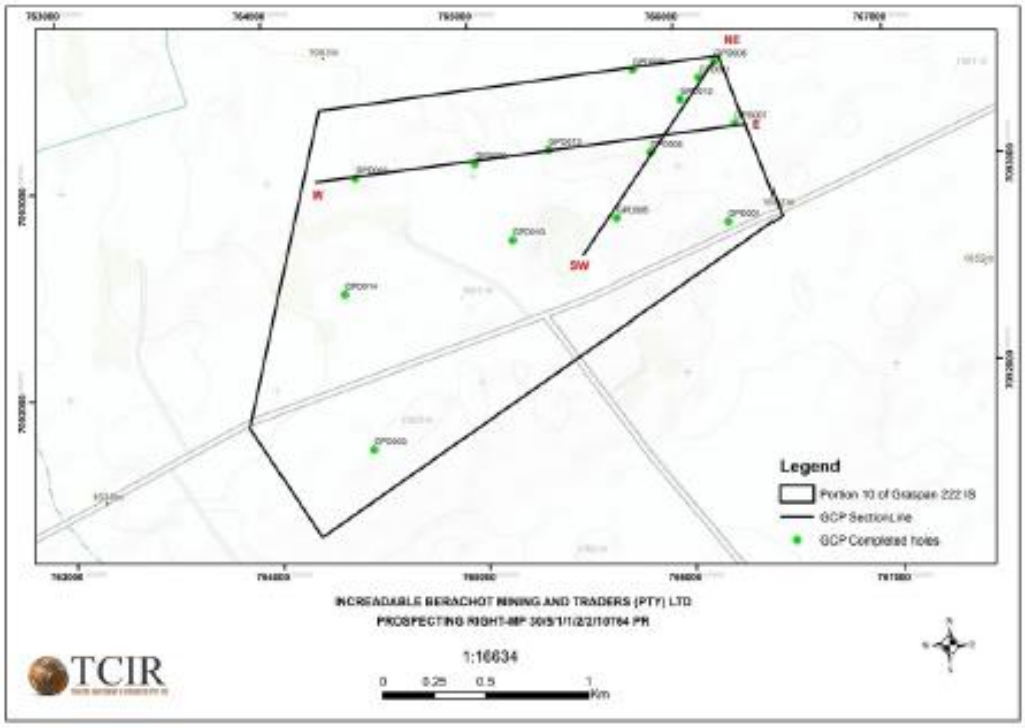
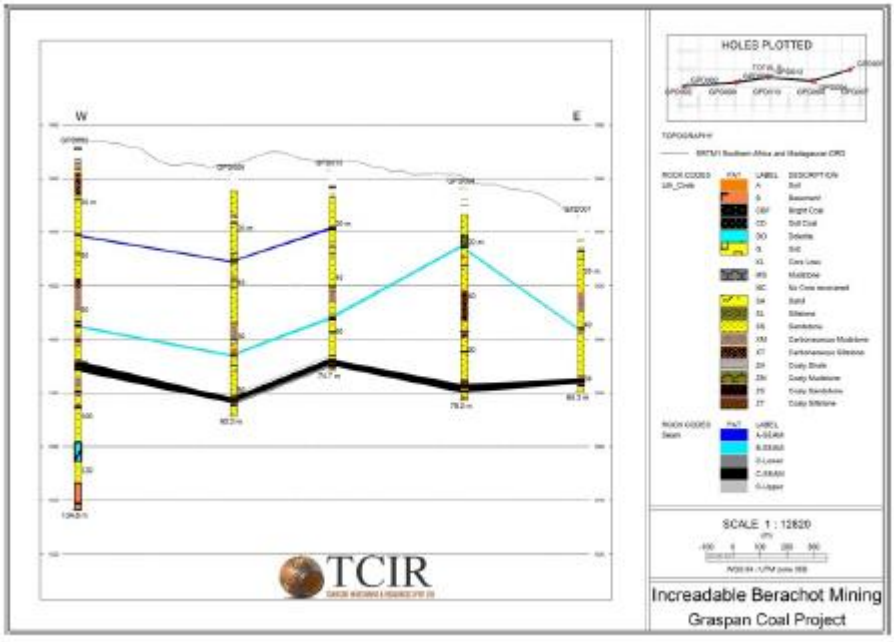


Figure 18: Graspan Cross section location for NE-SW and W-E.



Graspan SW to NE borehole cross section

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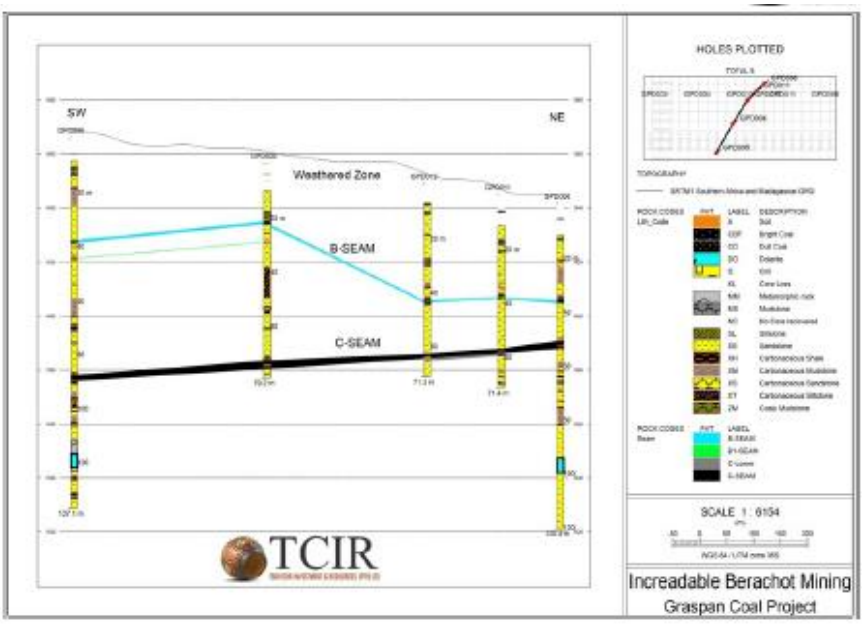

Graspan W to E borehole cross section

The Indicated Coal Resources are depicted in **Figure 19** and **Table 6**. The three areas in purple delineated by perimeter C250PER 1, 2 and 3 lie adjacent to the area which represents the Measured Coal Resource.

Table 6: Indicated In-situ Coal Resource and Raw Coal Qualities.

FIELD	Minimum	Maximum	Mean	PER ID	RD t/m³	Area (Ha)	Volume Mm³	GTIS Mt	Geol. loss %	MTIS Mt
Thickness (m)	2.97	3.14	3.08	C250PER1	1.72	14.12	0.435	0.747	15	0.635
GCV (MJ/kg)	17.4	18.8	18.1							
ASH (%)	38	42.5	41.1							
IM (%)	2.5	3	2.7							
VM (%)	14.4	18.4	17							
VMDAF (%)	24.7	34.3	30.5							
TS (%)	0.59	0.78	0.68							
RD (t/m³)	1.69	1.74	1.72							
Thickness (m)	3.04	3.08	3.06	C250PER2	1.67	8.06	0.247	0.412	15	0.35
GCV (MJ/kg)	19.1	19.3	19.2							
ASH (%)	33.6	37.6	35.3							
IM (%)	2.9	3.3	3.1							
VM (%)	20.9	20.9	20.9							
VMDAF (%)	32.9	32.9	32.9							
TS (%)	0.62	0.66	0.64							
RD (t/m³)	1.66	1.67	1.67							
Thickness (m)	3.04	3.12	3.07	C250PER3	1.67	14.96	0.459	0.767	15	0.652
GCV (MJ/kg)	18.5	19.3	18.9							
ASH (%)	31.9	37.6	33.4							
IM (%)	2.9	4.3	3.8							
VM (%)	20.9	21.2	21.1							
VMDAF (%)	32.8	34.7	33.2							
TS (%)	0.62	0.86	0.76							
RD (t/m³)	1.65	1.69	1.67							
Total					1.7	37.14	1.141	1.926	15	1.637

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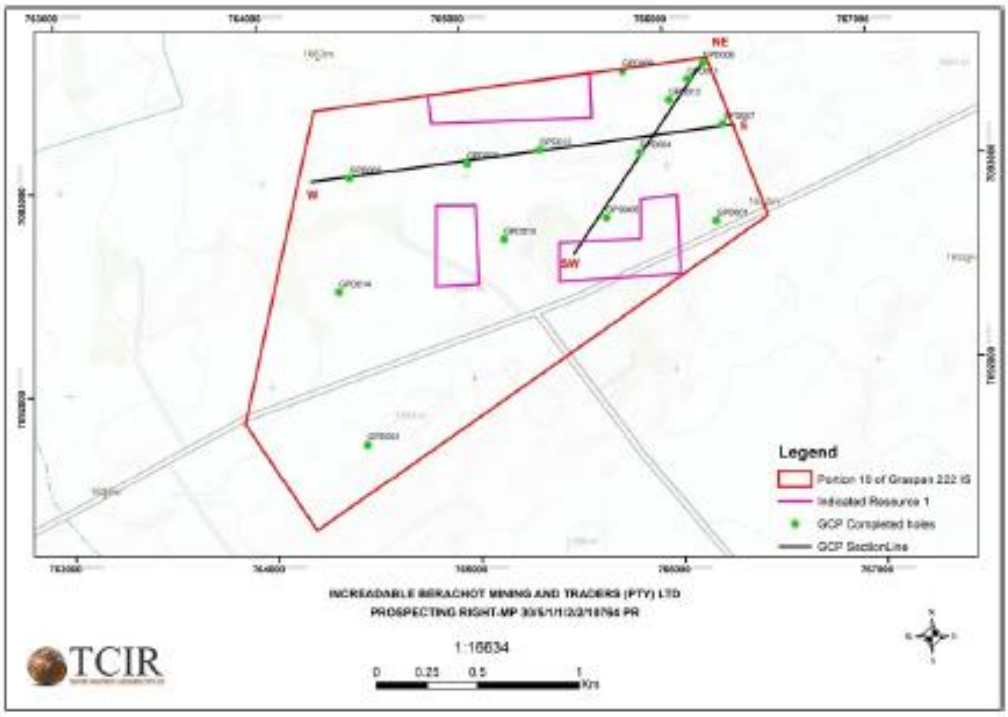

Figure 19: Coal Resources

The Indicated GTIS resources equal to 1.926 million tons and MTIS (Mineable Tons In-Situ) resources equal to 1.637 million tons. The average gross calorific value equals to 18.6 MJ/kg for the raw coal on air dried basis. The Graspan Coal Project (GCP) is a mid-sized, advanced stage, thermal coal exploration property with 6.781 MTIS (Indicated and Measured Coal Resource), and 5.737 MTIS (Inferred Coal Resources). This project located on the Ermelo Coalfield is potentially made up of one economic coal seam.

6.4.1 Basic plant design

The top-size of coal from the continuous miner is 350mm. A two-stage underground crushing plant will be installed (see Figure 20), and coal will be mined at approximately 567 tonnes per hour. Primary crushing of the run-of-mine ("RoM") coal will take place in the underground crushing station. In this crushing stage, RoM coal will be crushed from approximately -350mm to -80mm. The second crushing stage will produce approximately -50mm coal.

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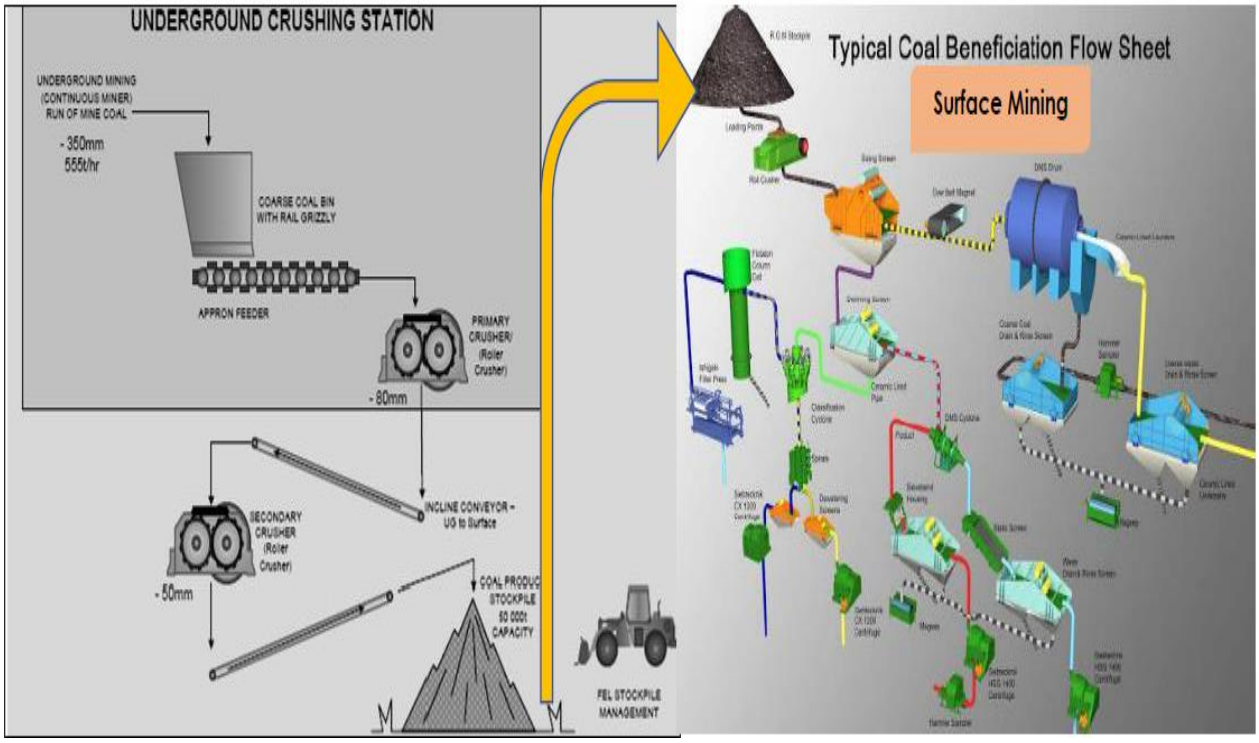

Figure 20: Typical coal beneficiation flow chart for underground and surface mining

6.4.1.1 Efficiency of the process

Together with an estimate of the mineral recovery rate, and the expected mass or volume of mine waste or residues together with the way it would be disposed of.

Gravity concentration of hard lignites using conventional jigs and heavy media separation equipment is prone to produce coal-rich fine Discard. This study presents a fine coal recovery process of very high efficiency, at reasonable capital investment and operational costs. The technical feasibility of upgrading the property of the predestined fine refuse of a lignite washing plant (with 36.2% ash content) was determined using gravity separation methods.

The laboratory tests carried out, together with the shaking table and Mozley multi-gravity separator (MGS) revealed the following results:

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Table 7: Laboratory Analysis

Six samples were received on the 11th of May 2017, for ultimate Analysis and samples were conditioned for 1 hour in a temperature controlled environment of 23°C ± 2 and relative humidity prior to analysis.

Our ref: 137798
Your ref: J7132 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	2.50	***	UAS 04 WI based on SANS 5925
Ash content (%)	29.00	29.74	UAS 05 WI based on ISO 1171
Hydrogen (%)	2.22	2.28	UAS 08 based on ASTM D 5373
Total Sulphur (%)	1.18	1.21	UAS 08 WI based on ASTM D 4239
Carbon (%)	56.22	57.66	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.61	1.65	UAS 08 based on ASTM D 5373
Oxygen (%)	7.27	7.46	By Difference

Our ref: 137799
Your ref: J7133 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	1.40	***	UAS 04 WI based on SANS 5925
Ash content (%)	66.50	67.44	UAS 05 WI based on ISO 1171
Hydrogen (%)	2.24	2.28	UAS 08 based on ASTM D 5373
Total Sulphur (%)	0.53	0.54	UAS 08 WI based on ASTM D 4239
Carbon (%)	25.29	25.65	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.60	1.62	UAS 08 based on ASTM D 5373
Oxygen (%)	2.44	2.47	By Difference

Our ref: 137800
Your ref: J7134 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	1.90	***	UAS 04 WI based on SANS 5925
Ash content (%)	19.70	20.08	UAS 05 WI based on ISO 1171
Hydrogen (%)	2.19	2.23	UAS 08 based on ASTM D 5373
Total Sulphur (%)	1.71	1.74	UAS 08 WI based on ASTM D 4239
Carbon (%)	63.99	65.23	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.60	1.63	UAS 08 based on ASTM D 5373
Oxygen (%)	8.91	9.09	By Difference

Our ref: 137801
Your ref: J7135 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	2.80	***	UAS 04 WI based on SANS 5925
Ash content (%)	32.10	33.02	UAS 05 WI based on ISO 1171
Hydrogen (%)	2.19	2.25	UAS 08 based on ASTM D 5373
Total Sulphur (%)	0.68	0.70	UAS 08 WI based on ASTM D 4239
Carbon (%)	58.00	59.67	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.61	1.66	UAS 08 based on ASTM D 5373
Oxygen (%)	2.62	2.70	By Difference

Our ref: 137802
Your ref: J7136 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	2.30	***	UAS 04 WI based on SANS 5925
Ash content (%)	65.50	67.04	UAS 05 WI based on ISO 1171
Hydrogen (%)	2.14	2.19	UAS 08 based on ASTM D 5373
Total Sulphur (%)	0.13	0.13	UAS 08 WI based on ASTM D 4239
Carbon (%)	24.65	25.23	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.59	1.63	UAS 08 based on ASTM D 5373
Oxygen (%)	3.69	3.77	By Difference

Our ref: 137803
Your ref: J7137 (11/05/2017)

Analysis	Result (AD)	Result (DB)	Method used
Moisture in analysis sample (%)	2.00	***	UAS 04 WI based on SANS 5925
Ash content (%)	38.30	39.08	UAS 05 WI based on ISO 1171
Hydrogen (%)	1.96	2.00	UAS 08 based on ASTM D 5373
Total Sulphur (%)	2.19	2.23	UAS 08 WI based on ASTM D 4239
Carbon (%)	51.25	52.30	UAS 08 based on ASTM D 5373
Nitrogen (%)	1.60	1.63	UAS 08 based on ASTM D 5373
Oxygen (%)	2.70	2.76	By Difference

DB: DRY BASIS
AD: AIR DRY

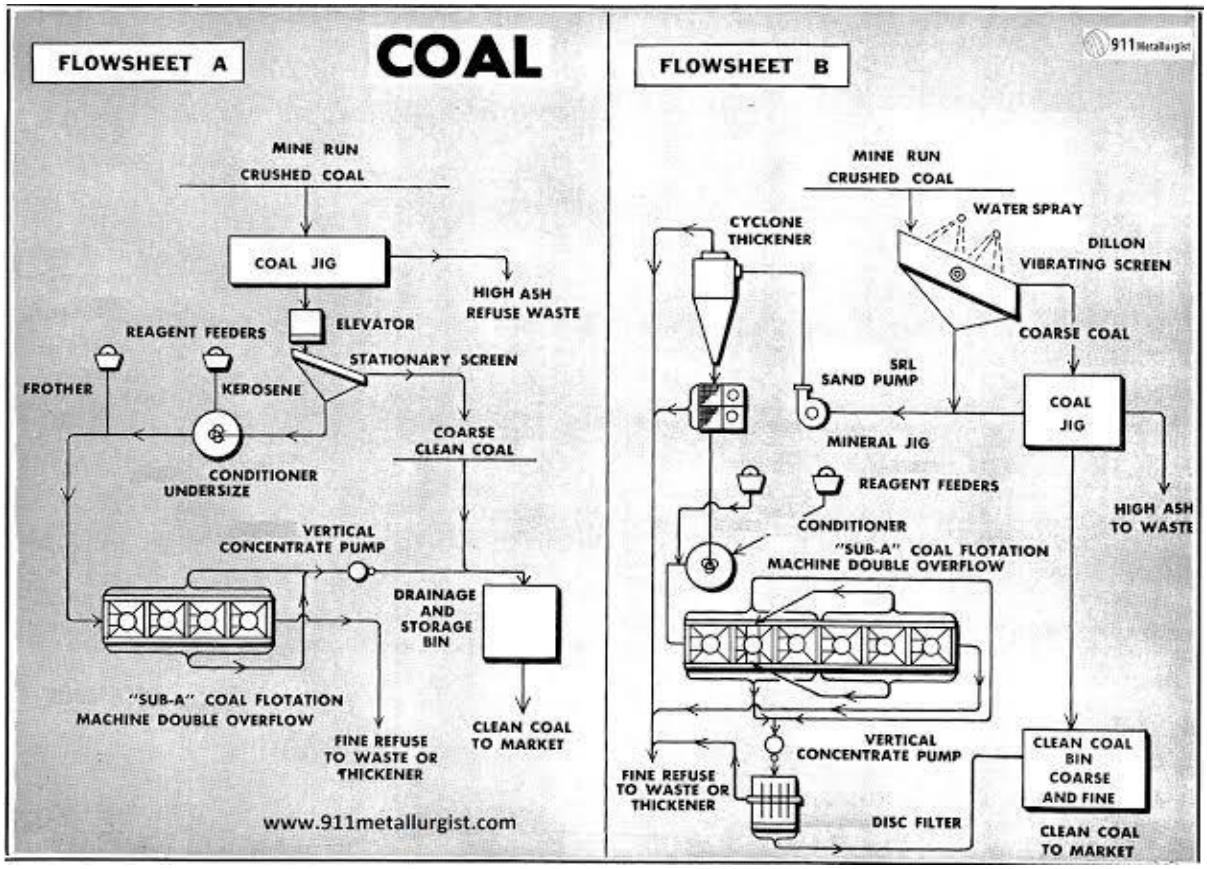

Figure 21: Example of Coal processing and beneficiation

Effective dewatering of coal has become increasingly important in meeting tight product specifications and improving handle ability. The most popular equipment is vibrating screens and basket centrifuges for coarse coal, scroll centrifuges for fine coal, and vacuum filters for ultrafine product from flotation. While dewatering of larger sizes (less than 0.5mm) has traditionally presented limited problems, the dewatering of finer coal, particularly by vacuum filtration, has proven problematic. Initially, disc filters were used, but were later replaced by rotary vacuum filters and, more recently, horizontal belt vacuum filters. For some applications, where additional processing costs can be justified, hyperbolic filtration is used to produce low-moisture filter cakes.

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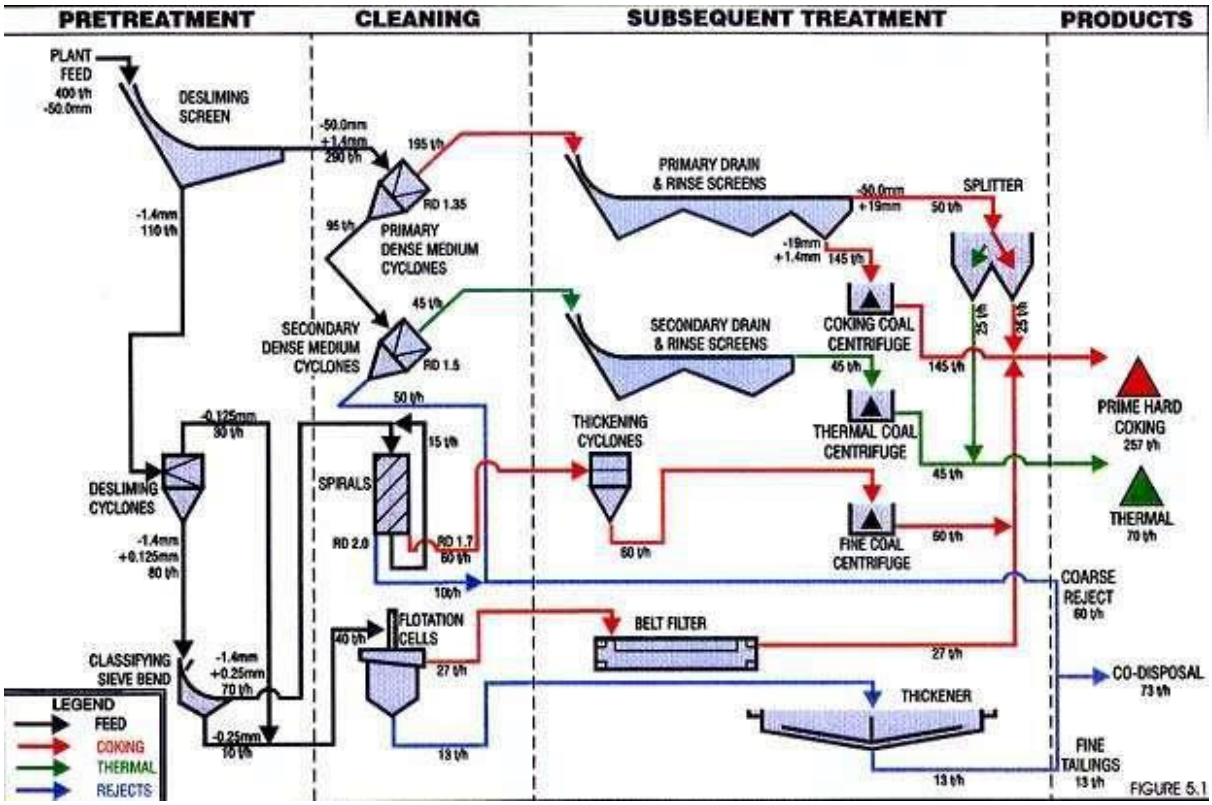

Figure 22: Example of Flow chart of coal processing plant

Centrifuging (including screen bowl, scroll/screen and basket scroll centrifuges) is also used to dewater fine coal; it costs less than vacuum filtration. R&D Company is continuing to develop centrifuges for the dewatering of even finer particle sizes. Dewatering of fine coal is enhanced by the addition of flocculants, which the R&D Company also continuously enhances.

6.4.1.2 Discard treatment and water clarification

Discard treatment remains the most difficult and expensive area of coal preparation. As such, optimising thickener performance and reducing operating costs, have remained subjects of ongoing development and, in recent years, this has led to the introduction of a range of “high-rate” thickener designs. This has been accompanied by the development of advanced chemical reagent systems to improve water quality and increase thickener output.

Many modern coal preparation plants employ a closed water circuits. To a large extent, this has been in response to increasing environmental pressure to reduce the use of Discard lagoons. Traditionally, further Discard dewatering is carried out using plate and frame filter presses. Filter pressing is a batch process, which is also the focus of considerable development work to optimise press cycle performance. As a result, modern installations are highly automated and offer excellent dewatering performance, producing filter

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cakes with very low moisture content. Filter pressing is still, however, a costly operation and recent years have seen the introduction of multi-roll filters (MRFs). Although dewatering performance is inferior to that of the plate and frame filter press, MRFs are now being selected for many applications because of the low capital costs and ease of operation

Figure 23 indicates the positioning of the plant infrastructure, which will consist of:

- Pollution Control Dam (PCD)
- Discard Dump
- Processing Plant
- Coal Stockpile and Loading Area
- Ablution and Changing House
- Topsoil Stockpiles
- Stores, Workshops and Wash bays
- Integrated Stockpile
- Offices and Workshops
- Access Road
- Weighbridge
- Fuel Storage
- Hard Parking
- Box cut
- Underground Mine Area
- Decline Ventilation
- Ventilation Shafts
- Water Trenches

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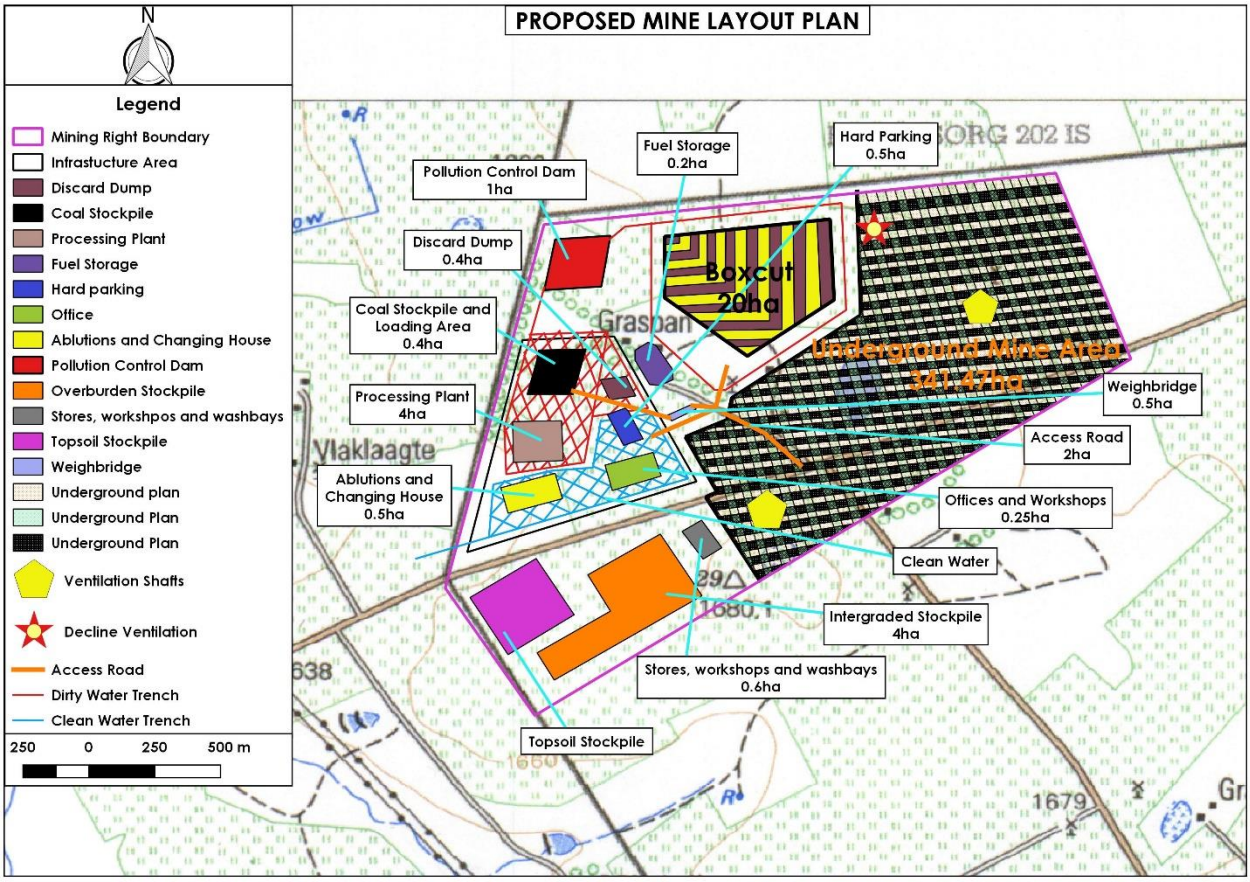

Figure 23: Proposed mine layout

From the product stockpile, coal will be reclaimed and delivered to the Eskom and nearest rail-siding to the area of interest. The plant will use existing Eskom power line with back-up generators as an electricity source. Equipment that will require electricity include crushers, apron feeders, conveyors, offices, the medical facility, potable water pump station and sewerage pump station.

6.4.1.3 Areas proposed for mining

Although the mining right extends to a larger area, the beginning of the actual surface mining will be undertaken on a smaller 5 hectare area before commencing with underground mining. This mining plan is based on the results of the prospecting that occurred in the area and the availability of coal. The mineral to be mined is coal. Locally the coal seams occur within the Vryheid Formation of the Ecca Group of which the Pietermaritzburg and Vryheid Formations are found in the Ermelo Coalfield. The Ermelo Coalfield stretches from Carolina to Standerton and Wakkerstroom in the Mpumalanga Province. Coal qualities in mineable seams are generally good.

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The IBM Right Area falls on the boundary of the Ermelo Coalfields. There are 5 identifiable coal seams named from top to bottom Seams A, B, Seam C Upper, Seam C Lower and Seam D, however only C Seam has the potential to be economically extracted.

The C-Seam (CL) ranges in thickness from 1.8m to 3m across the project area. This Seam (CL) is well developed and intersected in all fourteen (14) boreholes from a minimum depth of 49.79m to a maximum depth of 104.59m. The coal seam has an average thickness of 2.8 m and is generally observed to be the CL seams in all the fourteen (14) boreholes. The CL Seams is well-developed in the project area than the CU and has with a sandstone parting in the project area. The CL-Seam is shallower towards the north-eastern corner of the project area. Thus the operation will be mined via surface which will subsequently be an underground, bord-and-pillar methods using continuous miners. The pillars are left behind as a primary roof support system. The site is overlain by sandstone and mining depth ranges from 95m to 160m and therefore safety factors between 1.6 and 2 for shallower to deeper mining areas will prevent surface subsidence.

At this stage it is anticipated that only the C Seam, where the seam thickness is greater than 1.5m, will be mined (LOM estimated at 30 years). The remaining coal where the parting is less than 1m and the C Upper and C Lower remain could potentially be mined at the end of LOM should it prove economically viable at that point in time, thus extending the LOM to 30 years.

6.4.1.4 Waste stockpiles

Waste stockpiles will contain all the waste products from the mine workings. Waste stockpiles are indicated in the list of waste activities published in the GN. No. R. 632 of 24 July 2015 in accordance with the National Environmental Management: Waste Act 59 of 2008. One of the activities which guides the waste stockpiles is; Activity 17 of GN.R. 984: *"Any activity which requires a mining right as contemplated in section 22 of the Mineral Resources and Petroleum Development Act (MPRDA), 2002 (Act no. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the MPRDA."*

The applicable waste management activity (Category A activity 1 and Category B listed activity 11 of GN.R. 633) relates to residue stockpiles associated with the mining of the coal mineral, covering an extend of not more than 355 ha, on the property mentioned. It also include the construction of PCD to contain the "dirty" storm water runoff and also a Discard dump to contain waste. An example of how waste will be dispatched is shown below.

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Figure 24: Typical example of Waste stockpile area.

In terms of new regulations, mine waste residue stockpiles must comply with landfill requirements, as well as the National Norms and Standards for the Assessment of Waste for Landfill Disposal, 2013; and National Norms and Standards for Disposal of Waste to Landfill, 2013.

6.4.1.5 Decommissioning phase

Simultaneous mine rehabilitation must be undertaken with underground mining; final rehabilitation will take place after the operational phase has ended. The decommissioning and closure of underground mining will occur with an applicable EMPR as part of a closure EIA to be conducted, as well as with any other closure plans pertaining to mine infrastructure and facilities. This phase starts at the end of the project's operational phase and ends when the site obtains a Closure Certificate from the regulatory authorities. It may include a period where there is no activity on the site other than monitoring prior to closure completion. The progressive total for rehabilitation to be provided is calculated on the financial provision quantum attached as appendix 9.

6.4.1.6 Post-closure phase

Monitoring of surface and ground water quality, and the indefinite management of decant levels by pumping water out of the pit and underground voids to the MWRP(Municipality Waste Recycling Programme) for treatment, will be conducted during this phase.

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7 POLICY AND LEGISLATIVE CONTEXT

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT Description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipality development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	REFERENCE WHERE APPLIED
The National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the National Environmental Management: Waste Act (Act No 59 of 2008) (NEM:WA) The National Environmental Management Act (Act 107 of 1998 as amended on the 8th of December 2014) (NEMA) and the regulations and associated listed activities identified under Regulations 982, 983, 984 and 985, is the key national legislation underpinning environmental authorisations in South Africa. The Department of Mineral Resources (DMR) is the competent authority for mining-related applications in terms of NEMA. The DMR, along with the Department of Environmental Affairs (DEA), will take into account the NEM:WA.	NEMA and associated regulations are directly relevant to this Application.
The National Water Act (Act No. 36 of 1998) (NWA) In terms of Chapter 4 of the NWA, activities and processes associated with the proposed Graspan mine and associated infrastructure, must be licensed by the Department of Water and Sanitation (DWS). An Integrated Water Use Licence Application (IWULA) will be lodged with the DWS in terms of Section 21 of the NWA, which lists several water uses requiring authorisation. An Integrated Water and Waste Management Plan (IWWMP) will be compiled and submitted in support of the IWULA.	An IWULA and IWWMP have already been applied for proposed Graspan mine. The company has applied for WULA and the mining right is running parallel to WULA application.

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8 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

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

The National Heritage Resources Act (Act No. 25 of 1999) The National Heritage Resources Act requires all developers (including mines) to undertake cultural heritage studies for any development exceeding 0.5 ha in extent. It provides guidelines on impact assessment studies to be undertaken where cultural resources may be disturbed by development activities. The document must be approved by the South African Heritage Resources Agency (SAHRA) as part of the EIA.	An HIA was conducted to analyse the site for any cultural or historical elements
The National Environmental Management: Air Quality Act (Act 39 OF 2004) The National Environmental Management: Air Quality Act has a list of activities requiring an air emissions license. The objectives of this act are to reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development	Not applicable
National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA) This act requires that all people and organisations act with due care to conserve and avoid negative impacts on biodiversity, and to use biological resources sustainably, equitably and efficiently. Biodiversity refers to the life-support systems and natural resources upon which we depend. NEM:BA informs the potential for activities triggered by Listing Notice 3 (R. 985) in the 2014 NEMA Regulations. No Listing 3 activities were identified for this project	Biodiversity study has been conducted to analyse the site and the Mpumalanga Tourism & Parks has been consulted and provided land use recommendations that will be considered in this application.
Spatial Planning and Land Use Management Act (Act No. 16 of 2013) (SPLUMA) The SPLUMA was promulgated in May 2015.	Department of Public works who are the landowners have advised the client that already there's a lessee at the farm portion who is using the land for agricultural activities, thus the department of public works also advised the client to apply for a lease and also rezone from Agricultural activities to Mining activities. The application has already being lodged and is under consideration.

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Despite the slow economic recovery from the 2008 economic recession, there is still a high demand for coal in South Africa and internationally. South Africa depends on coal for electricity production. The potential benefits of the proposed project include:

- Long-term, national benefits of reliable power supply and the resultant socio-economic benefits
- Secure, long-term coal supply to Eskom, export to other countries;
- Job creation and other local, provincial and national socio-economic benefits;
- Local economic growth in Msukaligwa and surrounding areas, in various businesses, including suppliers, transport, etc;
- Economic benefits for contractors and other suppliers of goods and services.

The Mining right area falls within the Mpumalanga coal fields and as such the economy of the surrounding area is predominantly based on coal mining (and associated services such as coal hauling); agriculture; forestry and timber processing. Coal mining is the third biggest employer in South Africa (Stats S.A). According to Census 2011 (Stats S.A.), the unemployment rate for the Msukaligwa Local Municipality is some 26.8%. The proposed mining operation will create employment for 250 permanent staff and approximately 50 contract based staff. The project will further create employment through obtaining supplies and services within the area.

South Africa's energy is predominately coal fuelled. According to the Department of Energy about 77% of South Africa's energy needs are provided by coal. The Camden power station falls within the Msukaligwa Municipality less than 20km from the proposed site, and thus the mining right is ideally situated to supply coal to the power station. Apart from local markets, South Africa is the fourth largest coal producer in the world. Approximately 28% of South Africa's coal is exported (Stats S.A.). The Richards Bay coal line traverses the mining right area; and a number of sidings exist in the immediate vicinity. The primary product will be produced for the Eskom market and if export prices improve sufficiently then a dual product for the international export market and for the Eskom market will be produced.

The project will contribute directly and indirectly to the Country's GDP, as well as provide employment to members of the surrounding communities. As the operations will be mined via underground methods, the mine will not exclude other land uses from occurring.

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9 PROPOSED DEVELOPMENT FOOTPRINT AT THE APPROVED SITE

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

The proposed alternative was reached after a full evaluation of site sensitivities, including biodiversity studies (see attached biodiversity specialist study on Appendix 10).

9.1 Details of all considered alternatives

With reference to the site plan provided in Appendix 4 and the location of the individual activities on site, the following details of the alternatives considered are presented.

9.1.1 Location of proposed activity

Mineral resources are by nature very difficult to locate, as it requires extensive prospecting and calculated stock determination; minerals can only be mined where they exist. The proposed property is in an area with mining activities and extensive prospecting has indicated the presence of coal on this property (see boreholes in CPR and also under 6.3.8). Mineral can only be mined where identified and verified, therefore it was not practical to select other sites. No location alternative was considered.

9.1.2 Type of activity

The proposed coal mining will be by box-cut on surface and bord-and-pillar mining underground. No long haul methods will be used. All pillars must be thick enough to calculate standards and prevent subsidence. This is the best alternative; no other alternatives are considered. Two options for coal transport were considered: truck and above-ground conveyor. The use of the conveyor belt and hauling in the long-term from Graspan mine to nearest rail-siding was chosen for the following reasons:

- Most direct route
- Low maintenance costs (compared to hauling)
- Minimal impact of dust fallout expected, as the conveyor will be partially enclosed
- A lower impact in terms of noise and dust compared to trucking, due to lighter dust vehicles on existing road network to haul minerals.

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No major options were identified for the transport of coal from the underground workings to the surface silo. Conventional underground and incline shaft conveyors were considered, with only a few sub-options investigated for underground coal storage and transfer.

The current land use is predominantly agriculture, mainly grazing (unimproved grasslands) with limited cultivation. Livestock Farming: Sheep and Cattles; and Crop Farming: Maize

Although mining is expected to have the greatest impact on the environment in terms of the other land uses, it will have the greatest positive contribution to socio-economics in the area. Underground areas will not impact on the surface and other existing/proposed land uses can continue concurrently to mining. Only the land use of portion 10 will be affected by the mining operation. The type of mining to be conducted is limited by the depth of the coal resource and has not been assessed further. The quality of coal excavated from the property has a potential to be an Eskom need grade coal without the need of full processing.

The coal that is available on portion 10 of Graspan 222 IS has got a potential for Eskom market, hence full wash plant and mine residue facility will be established on site. The processing plant was selected based on mineable tonnages and various coal types being mined as well as market requirements and no alternatives with regards to the beneficiation process has been assessed.

Transport alternatives for product coal have been finalised (Traffic Assessment Report, Appendix 18). Communications with SANRAL are on-going.There are two alternative route system that can be used to access the proposed site, the study will assess the two routes alternatives and provide current roads and traffic conditions. The roads to be affected by the proposed mine activities are the following: **(i)** The N11 Road from Middleburg through Hendrina, Ermelo, Amersfoort, Volkrust and Newcastle to Ladysmith where it joins the N3 Road; **(ii)** R38 from Bethal through Hendrina, Carolina and Badplaas to the R40 in Barberton; **(iii)** Sluiter Street which is a local street in Hendrina Town connected to the N11; **(iv)** Gravel Road which connects Sluiter Street (Hendrina) with Davel Town; and **(v)** Internal Farm Roads used by the land owner/users.Remaining supporting infrastructure is needed in terms of the overall design of the mine and no further alternatives are discussed in terms of these. Best practices in the industry and, where applicable, SANS standards and legislative requirements will be followed in design, construction and management of infrastructure and activities on site.

9.1.3 Activity design and layout

The design and layout of the mining activity depends on the mining plan to be adopted. Mining design layout must be done in a way that reduces the amount of times a specific material is handled, subsequently

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reducing the environmental impact. Various designs and layouts for the mining operations were considered and the final layout was developed based on the availability of coal seams, as indicated by on-site prospecting. Infrastructure layout has already been altered to ensure that structures are situated far away from the drainage ways. Therefore, no other alternative layout was considered. The mining layout is designed to optimise the recovery of coal. The location of the box-cut and associated infrastructure area was based on the depth of the coal and a high-level sensitivity analysis. Infrastructure has been placed to avoid water resources and their associated riparian zones as far as possible. The alternatives considered included:

• Alternative 1: Box-cut and associated infrastructure to be located on the Portion 10 of Graspan 222 IS (Final Preferred Option)

• Alternative 2: Box-cut and associated infrastructure to be located on Portion 10 Graspan 222 IS. Alternative was eliminated due to additional costs associated with higher truck transportation costs and river crossings required to reach R38.

• Alternative 3: Box-cut to be established on Portion 10, with the plant and infrastructure area located on the portion 10 of Graspan 222 IS. Coal to be conveyed from Portion 10 to the nearest rail-siding for beneficiation and transport. Alternative was eliminated due to additional costs associated with a deeper boxcut, disturbance to water courses and greater environmental footprint.

9.1.4 Technology to be used for the activity

The various mining methods that were chosen for investigation are proven industry mining methods that are currently being exploited at various collieries country-wide. These methods can be summarised as follows:

- Bord-and-pillar mining, mechanised mining with continuous miners and shuttle cars
- Bord-and-pillar mining with additional pillar extraction
- Longwall mining
- Bord-and-pillar mining with the flexible train conveyor
- Open-cast mining

A trade-off between various mining methods (e.g. bord-and-pillar, bord-and-pillar stooping, long wall, and open cast) was conducted for the coal resources at the proposed Graspan mine project. A combination of bord-and-pillar and longwall underground mining methods were selected as the preferred mining method. In all other instances, industry best practice was selected and, where applicable, SANS standards and legislative requirements will be followed in design, construction and management of on-site infrastructure and activities. Technological alternatives were not further assessed.

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9.1.5 Operational aspects of the activity

In terms of operations on the proposed new mining area, operational infrastructure will be situated in a concentrated area where the mine shaft will be located. Coal will be mined, crushed and transported to the coal RoM stockpiles. From here, it will be loaded on conveyors and transported to nearest rail-siding or transported directly to Hadrina power station. In all instances, common industry practices were selected. Operational alternatives considered include:

- A full wash plant and mine residue facility will only be established as per this EMPR if the coal prices improve to make full beneficiation economically viable.
- In terms of the mine residue facility established on site, integrated disposal versus separate Discard and slurry handling was considered.
- Integrated disposal was opted for, as this will negate the need for separate handling facilities and thus reduce the overall area of disturbance.
- In addition, the fines (slurry) will settle between the cavities in the discard, making the dump less susceptible to spontaneous combustion.
- The Discard forms the main stabilising feature of the dump and the removal of the slurry component (should it be required) will not destabilise the dump.
- The dump can be reclaimed in future as the slurry will increase the dump's overall coal content.

9.1.6 The option of not implementing the activity

The no-go option will result in the protection of the water bodies (Two identified pans). Not mining the area for coal will result in the sterilization of the coal resource. This would reduce coal resources for power generation which is currently an issue in South Africa, as no viable base load power generation alternatives exist. The no-go option would also prevent the socio-economic benefits, including the need for job creation, increased socio-economic activity and social upliftment. Underground areas will have minimal impact on the surface and other existing/proposed land uses can continue concurrently to mine. Only the land use of Graspan 222 IS, portion 10 will be affected by the mining operation, which will be assessed as part of the final soil utilization guide and rehabilitation plan. If Increadable Berachot Mining and Traders (Pty) Ltd does not proceed with the Mining Right Application, socio-economic activities will be affected since the community has shown interest in the project in order for it to better their lives and provide stability in terms of job opportunities, thus another company is almost certain to apply for the rights.

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9.1.6.1 Details of the public participation process

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

During the public participation process, various stakeholders were identified and automatically registered. A desktop study was conducted to identify communities on and adjacent to the proposed Grapan mine. Stakeholders captured on the database for the project include:

- Owners or persons in control of the land
- Occupiers of the property where the development is taking place
- Owners and occupiers of adjacent land
- Provincial and local government (relevant local and district municipalities)
- Organs of state, other than the authorising authority, such as the Department of Agriculture, Forestry and Fisheries (DAFF), or Department of Roads, having jurisdiction in respect of any aspect of the proposed project
- Relevant resident associations, rates payers organisations, community-based organisations and non-government organisations (NGOs)
- Environmental and water bodies, forums, groups and associations
- Private sector (business, industries) in the vicinity.

A brief introduction document (BID) was compiled and emailed to all stakeholders and affected parties (see Appendix 7 for a copy of the BID). Copies of the BID were also distributed to I&APs via direct consultation or e-mail. Copies of the BID were delivered by hand and emailed to the local communities and to the following government departments and municipalities:

- Department of Water Affairs
- Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)
- Department of Land Affairs
- Msukaligwa Local Municipality
- Gert Sibande District Municipality
- SANRAL
- Neighbouring landowners
- MTPA
- Eskom
- Transnet

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- Department of Public Works, etc.

In addition, site notices were displayed at various visible areas around the project site about the actual site where mining will take place and also invite to the scheduled meeting of the 12th of July 2019 (See tables below). Three newspaper advertisements were published: one in the *Middleburg Observer* on the 12th of October 2018 and another on the 19th of October 2018 on Highvelder whereby the newspaper advert that was placed in the Observer Newspaper was declared to have been placed in the wrong newspaper as those who are directly affected by the project are from Msukaligwa which is catered by Highvelder, thus the Highvelder newspaper was placed for the public to be notified about the project. Another newspaper was placed on the 12th of July 2019, which informed the I&APs of the EIA process under way and also invited all I&APs to attend the meeting and be registered. Copies of these and the BID are attached as appendix (5-7).

Consultations were conducted and are still scheduled to be conducted with surrounding owners and persons leasing land. A meeting was held by IBMT company owners and the Landowner (Public works department) on the 8th of July 2019, whereby the client was informed to apply for a lease agreement in order to mine and the application forms were sent on the 10th of July 2019. The Sinokwanda agriculture and mining co-operative issued the client and consultant firm their lease agreement for portion 10 of Graspan 222 IS which they received from department of Land Affairs on the 26th of June 2019 and also sent through their comment form which in a nutshell emphasised of their willingness to work together with the mine on the portion in question. They also emphasised the need for such a mine to commence in order to assist the youth with employment and also creating business platform for the locals (See consultation report in appendix 24 for full disclosure of the content). Two meetings were held on the 12th of July 2019: one with the stakeholders and another with the Davel Community. All parties approved the proceedings of the mine. The purpose of the meeting was to introduce the proceedings of the project and further identify I&APs to register. A meeting was held with Graspan community members on the 12th of September 2019 who wanted clarity of the actual landowner for portion 10, to add on local information of which other communities should be consulted, and also to know if ever the mine will consider them for employment. The outcomes of the meetings were captured and attached under public participation process (Appendix 24). Since consultation is an on-going process, more meeting minutes and registering of I&AP's will be updated even after submission of final EIA report and also during operation phase.

A desktop study of Social Impact Assessment was conducted, the results of which are included in the SR&EIAR. All specialist studies relating to the mining area's state, as well as measures to mitigate and prevent of environmental damage, were included in this report in tables sections.

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As part of the on-going public participation process, the scoping phase was the first step where potential I&APs were registered. The scoping report was accepted on the 14th of December 2018. After the initial public participation process, the public was offered an opportunity to review the scoping report for comments and the comments are enclosed as part of the consultation report in appendix Section. Those who did not review the report at the time, are currently being updated in this regard. The scoping report was submitted for public view for thirty days from the 20th of October 2018 to 18th of November 2018 and registered I&APs were notified.

The draft EIA was compiled and submitted for public view to all stakeholders and registered I&APs for thirty days. A public meeting was held on 12th of July 2019 at Davel Community Hall whereby all concerns and comments raised were sufficiently noted and responded to by both the applicant and consulting firm. A consultation meeting was also held with town planner Ward Counsellor of Msukaligwa Local Municipality (Mr John Blose). A lease agreement issued to the S'khosana trust people was made available from the land owner who is the Department of Public Works and the lease agreement together with full consultation details is enclosed on the consultation report. A meeting was held by the client with Mr Blose in regards to applying for a lease and the application was made on 29th of July 2019 and is under processing stage. All comments received from the I&AP's which includes those from the scoping phase and the current EIAr are enclosed together with the minutes, attendance registers and pictures taken during the course of the meetings. All captured information will be submitted to the DMR as proof of sufficient consultation. See Appendix 6-8 for a register of all the I&APs. Below are few of the site notices which were plugged.

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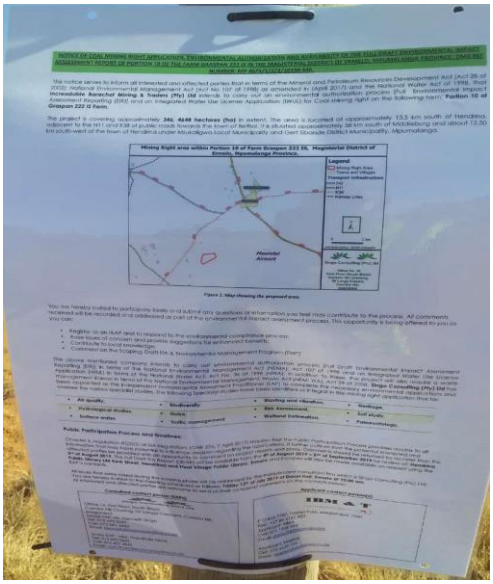
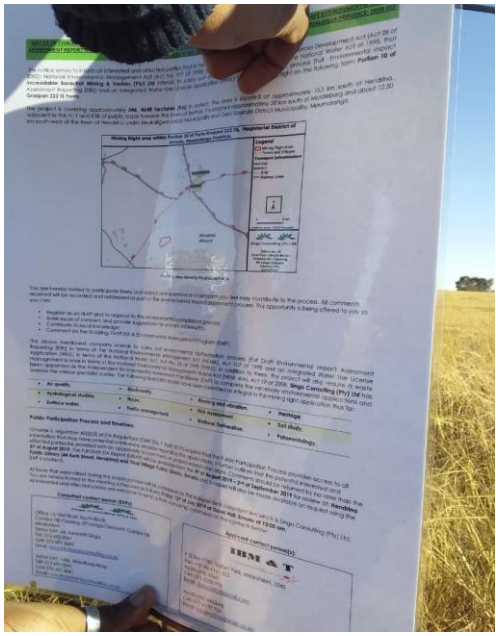
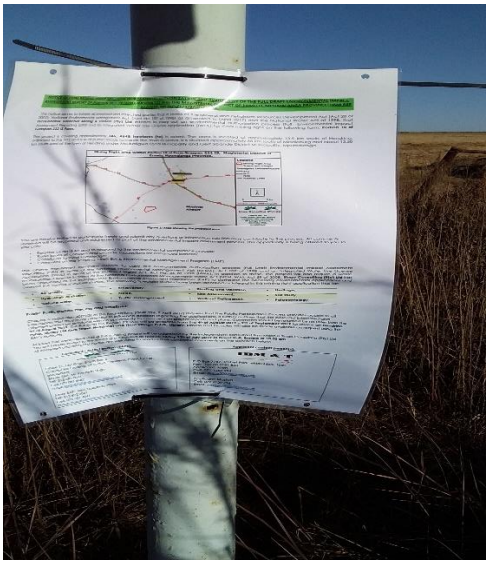
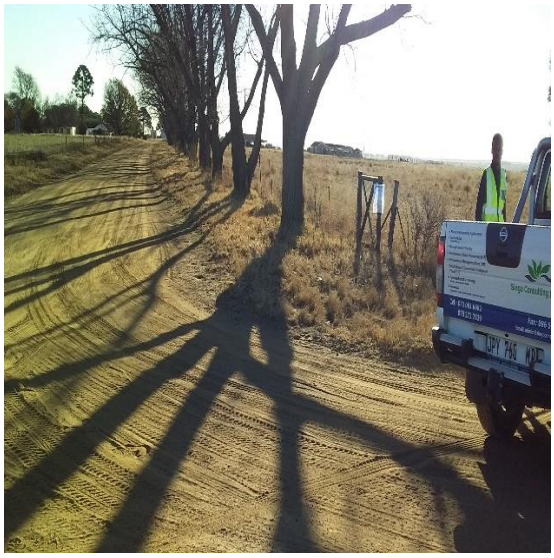
Site notices that were plugged around the farm boundaries ad mostly used roads.





Office No. 16 First Floor (South Block), Corridor Hill Crossing 09 Langa Crescent, Corridor Hill, eMalahleni, 1040 P/Bag X7297, Postnet Suite 87, eMalahleni, 1035, Mpumalanga Province, ZA
T: 013 692 0041 F: +27 86 5144 103: admin@singoconsulting.co.za





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Notices that were plugged around the boundaries of the farms, local communities and also national raods concrning the meeting that was scheduled on the 12th of July 2019 at Davel Community Hall.

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A depiction of the Public meeting that was held on the 12th of JULY 2019 at Davel Community Hall with the Community.

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A depiction of the Public meeting that was held on the 12th of JULY 2019 at Davel Community Hall with stakeholders and Ward Counsellor.	
	

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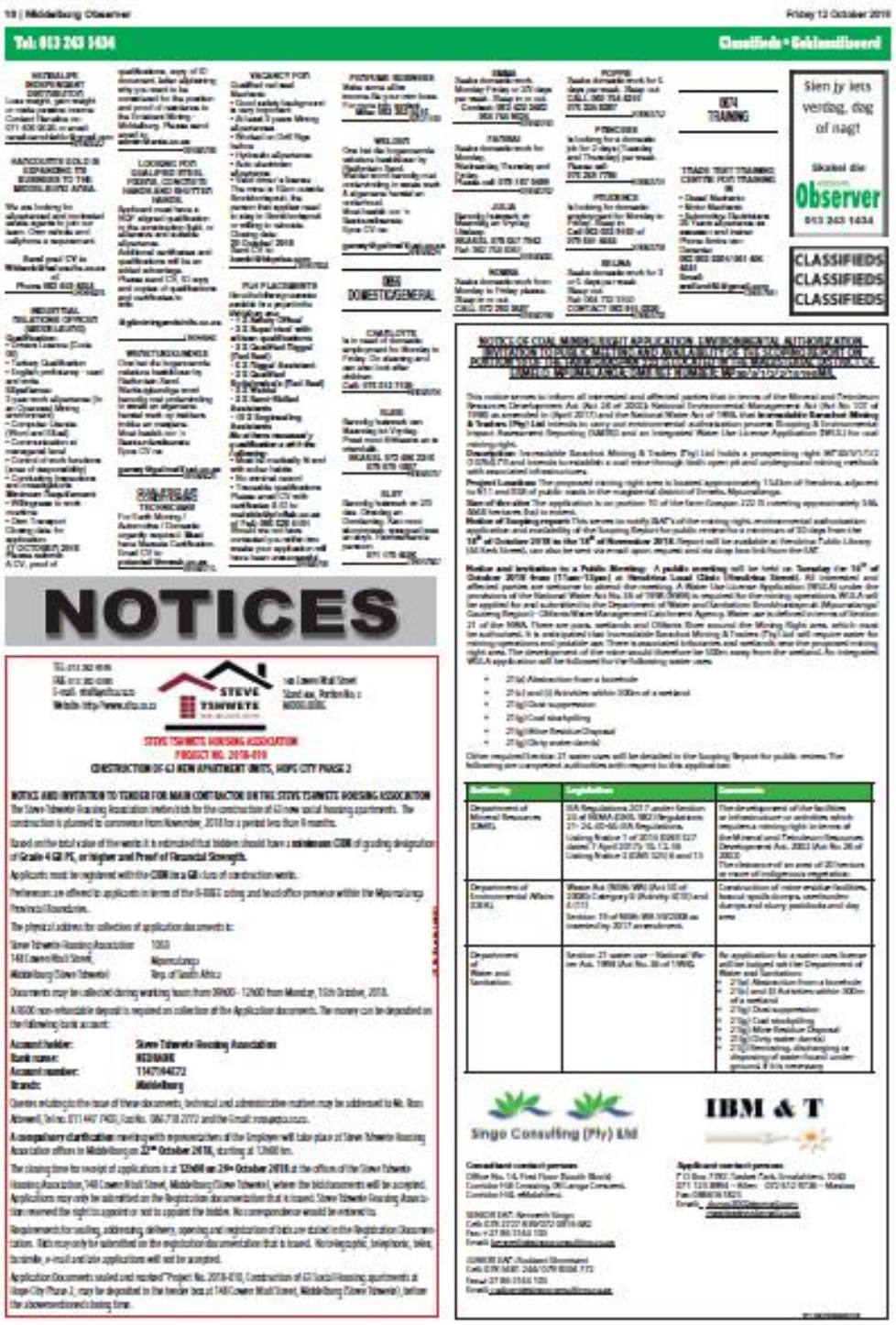
Proof of newspapers that were published on the 12th and 19th of October 2018 together with the 12th of July 2019 Respectively.

One newspaper was placed on Middleburg Observer on the 12th of October 2018.



NOTICES

STEVE TSHWETE HOUSING ASSOCIATION

PROJECT NO. 2018-010

CONSTRUCTION OF 63 NEW APARTMENT UNITS, HOPE CITY PHASE 2

NOTICE AND INVITATION TO TENDER FOR MAIN CONTRACTOR ON THE STEVE TSHWETE HOUSING ASSOCIATION

NOTICE OF CIVIL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORIZATION

Singo Consulting (Pty) Ltd

IBM & T

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One newspaper was placed on Highvelder on the 19th of October 2018.

19 October 2018 **HIGHVELDER** - Schools 11

Skuts staan hul man

Ernie speel vir Pumas se 7's-rugbyspan

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORIZATION, INVITATION TO PUBLIC MEETING AND AVAILABILITY OF THE SCOPING REPORT ON PORTION 10 OF THE FARM GRASPAN 222 IS LOCATED IN THE MAGISTERIAL DISTRICT OF ERMELO, MPUMALANGA

Project Location: The proposed mining right area is located approximately 13,4km of Hendrina, adjacent to N11 and R38 of public roads in the magisterial district of Ermelo, Mpumalanga.

Size of the site: The application is on portion 10 of the farm Graspan 222 IS covering approximately 346, 4000 hectares (ha) in extent.

Notice of Scoping report: ... availability of the Scoping Report for public review for a minimum of 30 days from the **19th of October 2018 to the 19th of November 2018.** Report will be available at Hendrina Public Library ...

Notice and Invitation to a Public Meeting: A public meeting will be held on Tuesday the ... at Hendrina Local Clinic ...

- 21(a) Abstraction from a borehole
- 21(c) and (i) Activities within 500m of a wetland
- 21(g) Dust suppression
- 21(g) Coal stockpiling
- 21(g) Mine Residue Disposal
- 21(g) Dirty water dam(s)

Other required Section 21 water uses will be detailed in the Scoping Report for public review.

The following are competent authorities with respect to this application:

Authority	Legislation	Comments
Department of Mineral Resources (DMR).	EIA Regulations 2017 under Section 24 of NEMA (GNR. 982) Regulations 21-24, 40-44; EIA Regulations. Listing Notice 1 of 2014 (GNR 327 dated 7 April 2017): 10, 12, 56. Listing Notice 2 (GNR 325) 6 and 15	The development of the facilities or infrastructure or activities which requires a mining right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002). The clearance of an area of 20 hectares or more of indigenous vegetation.
Department of Environmental Affairs (DEA).	Waste Act (NEM: WA) (Act 59 of 2008) Category B (Activity 4 (10) and 4 (11). Section 19 of NEM: WA 59/2008 as inserted by 2017 amendment.	Construction of mine residue facilities, topsoil spoils dumps, overburden dumps and slurry paddocks and day area
Department of Water and Sanitation.	Section 21 water use – National Water Act, 1998 (Act No. 36 of 1998).	An application for a water uses license will be lodged with the Department of Water and Sanitation: • 21(a) Abstraction from a borehole • 21(c) and (i) Activities within 500m of a wetland • 21(g) Dust suppression • 21(g) Coal stockpiling • 21(g) Mine Residue Disposal • 21(g) Dirty water dam(s) • 21(j) Removing, discharging or disposing of water found underground, if it is necessary

Consultant contact person: Singo Consulting (Pty) Ltd

Consultant contact person:

MILAN PARK MOTORS

116 DAMWAL STR - BETHAL | CONTACT THE WINNING TEAM MUAZZAM OR NICOLENE AT 017 647 1146 OR 017 647 1505

WE BUY CARS / BAKKIES FOR CASH! TRADE-INS WELCOME! FROM NO DEPOSIT TO LOW DEPOSIT - CALL US NOW FOR FURTHER DETAILS!

1ST INSTALMENT JANUARY 2019

One newspaper was placed on Highvelder on the 12th of July 2019.

12 July 2019 HIGHVELDER - Schools 13

Ligbron se wintersportspanne gereed vir Virsekerbeker en Noordvaal Reeks

Ligbron Akademie vir Tegnologie het die derde kwartaal met vriendskaplike wintersportwedstryde teen Hoërskool Voortrekker van Rietfontein op 9 Julie afgesluit.

Dié wedstryde het vir beide skole as voorbereiding vir die Virsekerbeker- en Noordvaal Reeks se eindwedstryde gedien.

Uitstekende sport het die toeskouers op hul tone gehou en Ligbron se spanne het gunstige resultate behaal.

Die rugbyspanne het hulle goed van hul taak gekwyt, met slegs twee spanne wat hulle wedstryde verloor het.

Die O/14 A-span het met 39-5 gewen, terwyl die O/16B-span hul teenstanders met 'n skitterende telling van 57-0 oorrompel het. Die O/15A-span het hul wedstryd 22-7 gewen, die O/16A-span het 'n 19-14 oorwinning behaal en die O/16B-span nooi die hoër hing met 'n telling van 24- 8.

Die derde span het 'n pakslae van 8-57 ontvang en die tweede span het 17-37 verloor.

Die eerste span het die toeskouers op die punte van stroke gehou in die spannende stryd.

Ligbron het as die winnaars van die veld afgeskof met 'n telling van 38-34.

Ligbron se hokkiespanne het al drie hulle wedstryde verloor.

Die O/16-span het hul wedstryd 8-3 verloor, terwyl die tweede span en eerste span met onderskeidelik 0-4 en 0-5 verloor het. Die netbalspanne het hard gevog op die baan, maar slegs een span kon daarin slaag om hul wedstryd te wen.

Ligbron se O/15-span het met 'n onderlaag van 7-20 van die baan afgestap, terwyl die O/16-span hul wedstryd in die laaste minute van die wedstryd met 17-15 gewen het.

Die tweede span het hulle wedstryd met 'n telling van 7-21 verloor, terwyl die eerste span 12-24 verloor het.

Meghan Hertz van Ligbron Akademie vir Tegnologie vat die bal van haar teenstander af tydens die vriendskaplike wedstryde teen Hoërskool Voortrekker.

Martin Meyer van Ligbron Akademie vir Tegnologie duik sy teenstander plat.

Cane Bruwer van Ligbron Akademie vir Tegnologie maak gereed om 'n doel vir Ligbron te probeer aantaken, tydens die vriendskaplike wedstryde teen Hoërskool Voortrekker.

NOTICE OF COAL MINING DRAFT APPLICATION, ENVIRONMENTAL AUTHORISATION AND AVAILABILITY OF THE FULL DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF PORTION 10 OF THE FARM GRASPAN 222 IS IN THE MAGISTERIAL DISTRICT OF EKURHULENI, MPUMALANGA PROVINCE.

Description. Immediate Excellent Mining & Traders (Pty) Ltd holds a Prospecting right (MP30/5/1/1/2/10 PR) and intends to establish a coal mine through both open pit and underground mining methods with associated infrastructure. The scoping report of this project has been completed and was accepted on the xxth of December 2018. In that regard a continuation of the full EIA is underway which will include several specialist studies, namely: Geotechnological Investigation, Groundwater Impact Assessment and Modelling, Baseline Ambient Air Quality Assessment, Biodiversity (Floristic and Faunistic) Impact Assessment, Archaeological Impact Assessment, Visual Impact Assessment, Aquatic ecology and Surface Water Assessment, Traffic Management, Noise and Blasting Impact Assessment, Soils and Land Capability Assessment, Agricultural Impact Assessment, Wetland Delineation and Impact Assessment (PES and EIS), Hazardous Environmental Geology.

Project Location. The proposed mining right project is located approximately xx km south of Hendrina, adjacent to the R35 and R36 of public roads towards the town of Belfast. It is located approximately xx km south of Middelburg and about xx km south-west of the town of Hendrina under Msukaligwa Local Municipality and Gert Sibande District Municipality, Mpumalanga.

Size of the site. The application is on portion xx of the Farm Graspan Farm no. 222 IS, covering approximately xxx, xxxx hectares (ha) in extent.

Notice of full Draft Environmental Impact Assessment Report (DEIAR). This serves to notify I&AP's of the mining right, environmental authorisation application and availability of the full Draft EIA Report for public review for a minimum of 30 days from the xxth of August 2019 till the xxnd of September 2019. The Draft EIA Report will be available at Hendrina Public Library for 30 days from the xxth of August 2019 till the xxnd of September 2019. The Draft EIA Report will be available at Hendrina Public Library for 30 days from the xxth of August 2019 till the xxnd of September 2019.

Mark Stowell and can also be sent via e-mail upon request and will be also be available from the EAP.

Notice and invitation to a Public Meeting. A public meeting will be held on Thursday the xxth of September 2019 at Stowell Hall, Hendrina from 10:00 am wherein all issues that were raised during the scoping phase will be addressed for Tango Consulting (Pty) Ltd and the applicant Immediate Excellent Mining & Traders (Pty) Ltd. All interested and affected parties are welcome to send in their comments/ comments in the meantime. Those who have sent in their comments through e-mail will be notified of the meeting via e-mail.

A Water Use License Application (WULA) under the provisions of the National Water Act No. 36 of 1998 (NWA) is required for the mining operations. WULA will be applied for and submitted to the Department of Water and Sanitation. It is anticipated that Immediate Excellent Mining & Traders (Pty) Ltd will require water for mining operations and potable use. An integrated WULA application will be followed for the following water uses, s21(a) Abstraction from a borehole, s21(c) and (i) Activities within xxxm of a wetland, s21(g) Dust suppression, s21(g) Coal stockpiling, s21(g) Mine Residue Disposal, s21(g) Storm water dam(s).

For further information please do not hesitate to contact us on the details below.

Consultant contact person (EAPs):

Singo Consulting (Pty) Ltd

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Senior EAP: Bonnett Singo

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Tel: +27 (0) 13 692 0041
Email: bonnett@singoconsulting.co.za
Senior consultant: Khayelihle Mbeni

Cell: +27 (0) xxx xxxx / +27 (0) xxx xxxx Tel: +27 (0) 13 692 0041
Email: khayelihle@singoconsulting.co.za

Applicant contact person:

HBM & T

P.O. Box xxxx, Ermelo Park, eMalahleni, 1040,
+27 (0) 72 xxx xxxx - Allen
+27 (0) 6 xxx xxxx - Abraham
Tel: +27 (0) 86 xxx xxxx
Email: xxxxxxxx@gmail.com

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9.1.6.2 Summary of issues raised by I&APs

Complete the table summarising comments and issues raised, and reaction to those responses. All comments from I&APs and public consultation meetings are included in the comments and response sheet in Appendix 8. A summary is given in the table below.

List of Affected Parties:

Names of I&AP's	Organization
Mrs. H Motha Mr. W Nyoni	Commission on Rural Development and Land Reform(Landowners)
Sinokwanda Agriculture and Mining Co Operative	Graspan 222 IS Portion 10 (Lawful Occupiers) Committee Members: • Mr. Skosana • Mrs. Makua • Mrs. Sindane • Mrs. Mtsweni • Mr. Magagula • Mr. Mathebula • Mrs. Mtsweni • Mrs. Mbazo • Mrs. Mahlangu Members: • Mrs. Manzini • Mrs. Mofokeng • Mr. P Magagula • Mr. Mathibela
Mr. Eric, Mr. Desmond Mr. Mduduzi Mrs. Pearl	Steve Tshwete Municipality
Mr. D Stander Mr. B Zwane Mr. S Mdluli	Msukaligwa Local Municipality
Mr. J Blose	Ward 10 Councillor
Mr. Felani	Govan Mbeki Local Municipality
Mr. K Mav	Department of Agriculture, Forestry and Fisheries
Mr. S Nevondo Mr. Mbulaheni	Department of Water and Sanitation
Mr. T Ramavhona Mr. E.J. Nkabinde	Department of Environmental Affairs

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Names of I&AP's	Organization
Mr. P Molapo	Department of Labour
Mr. P Mashiane	Department of Public Works
Mrs. P Lindoor, Mr. L Masuku, Mrs. N Nkambule	Commission on Restitution of Land Rights
Ms. T Lunanga Ms. P Nkosi	Mpumalanga Tourism
Mrs. M Lotter	Biodiversity Planning
Mr. M Wayleaves	Eskom
Mr. J Oliver	Sanral
Mr. D Moshe	Sanbi
Mr. Y Chabalala Mrs. M Mokoena	Transnet

Appendix for I & AP's

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference In this report where issues and/or responses were incorporated
Landowner					
Commision of Rural Development and Land Reform COMMISSION ON RESTITUTION OF LAND RIGHTS **Happy Motha** happy.motna@drdlr.gov.za Tell: 017 819 1373 **William Nyoni** william.nyoni@drdlr.gov.za Tell: 017 819 1373 Cell: 071 836 0524	X	10/07/2019	A lease agreement application was received so that IBM&T can apply.	IBMJ&T visited the department after learning that the are the landowners. They were advised on the procedure to follow. Consultants then followed the guidelines presented. A consultation email with BID, DMR Acceptance Letter and Regulation Map and Notification Letter as attachments was sent. An acknowledgement email was sent.	Appendix 3
	X	25/07/2019		An email reminding Mrs. Motha and Mr. Nyoni to send in their comments and documentation as the commenting period was expiring was sent.	Appendix 3
	X	29/07/2019		Completed Lease Agreement Application was sent to Mrs. Motha/Mr. Nyoni. Response will be updated as soon as one is received.	
	X	11/09/2019		A reminder email, with the draft EIA report and comment form was sent stating that they should revert before the expiration date.	

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference In this report where issues and/or responses were incorporated
	X	13/09/2019		A reminder email was sent to remind Mrs. Motha/Mr. Nyoni to revert with information regarding the Lease Agreement Application which was sent on 29/07/2019.	
	X	25/09/2019		A reminder email was sent to Mrs. Motha/Mr. Nyoni to revert with regard to the lease agreement application.	
Lawful occupiers					
Mr Skosana (Sinokwanda Committee Member) Cell: 073 048 7655	X	11-10-2018	According to a telephone communication that was held on the 11-10-2018 between Mr. H Skosana and EAP- Rudzani Shonisani, it was discovered that there's no email address that the EAP can send the documents to, however it was declared that it shall be found and communicated back for further process.	On the 15-10-2018, the EAP made it an effort to call again and alert the landowner of the meeting that will be held at Hendrina on the 16-10-2018.	Appendix 3
	X	16-10-2018	A meeting was held. Refer to Appendix 12	Following the meeting that was held, telephone communications were held (30-10-2018) in order to obtain the rightful documents of the farm and the documents are still to be received by the EAP.	
	X	08/07/2019		After receiving an email address to be used on behalf of Mr. Skosana, a consultation email with BID, DMR Acceptance Letter and Regulation Map and Notification Letter as attachments was sent. We later discovered that the email given is utilised by someone else and not Mr. Skosana	

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		**Date comments received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference** In this report where issues and/or responses were incorporated
	X	18/07/2019			
	X	22/07/2019		A reminder about the commenting period lapsing was sent to Mr. Skosana.	
	X	25/07/2019		On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call the lawful occupier and remind him to revert with him comments as they are important for report compilation. An email reminding the lawful occupier to send in their comments and documentation as the commenting period was expiring was sent.	

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		**Date comments received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference** In this report where issues and/or responses were incorporated
				(No comment form was received from Mr. Skosana but Mr. Skosana is part of the Sinokwanda Agriculture and Mining Co Operative represented by 9 committee members. Mrs. Makua sent in their lease agreement and comment form acting as a representative for all committee members.)	
Mrs. Mbazo/ Mrs. Makua (Sinokwanda committee members) mbazo.l.m@gmail.com/ happynokuthula2@gmail.com Cell: 078 535 1749	X X X X	12-10-2018 02-11-2018 08/07/2019 22/07/2019	Communication was held on telephone concerning the actual documents that proves that the farm portion 10 has been leased to the Sinokwanda by the government. The documents were sent via email: THATHOBANZI TECHNOLOGIES [mailto:thathobanzi.technologies@gmail.com]	Landowner letter was sent and comments are attached. The comment forms and lease agreement documents are well received, and it was communicated on telephone. A consultation email with BID, DMR Acceptance Letter and Regulation Map and Notification Letter as attachments was sent. On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call the lawful occupier and remind her to revert with her comments as they are important for report compilation.	Appendix 3

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference In this report where issues and/or responses were incorporated
	X	25/07/2019		An email reminding the lawful occupier to send in their comments and documentation as the commenting period was expiring was sent.	
	X	02/08/2019	A comment form and lease agreement documents were received from Mrs. Makua. (Refer to Appendix 3/Appendix 10) stating the terms of the lease for Graspan 222 portion 10. The comment form was emphasising on the fact that the Sinokwanda people are lease owners for graspan 222 IS, portion 10 and also they will appreciate being part of the mining right as it will be of great assistance in terms of job opportunities around the Graspan community more especially for the youth.		
	X	05/08/2019		Acknowledgement email was sent.	
	X	25/09/2019		Response letter was delivered to Sinokwanda Agriculture and Mining Co-Operation stating that Singo Consulting (Pty) Ltd on behalf of Increadable Berachot Mining and Traders (Pty) Ltd, acknowledges the receipt of your comments. The Surface mining activities(Box cut) that will take place in Graspan 222 IS, Potion 10 will only affect a small part of portion 10, whereby	Appendix 3

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		**Date comments received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference** In this report where issues and/or responses were incorporated
				the remaining extent will be mined with underground mining method, which in turn will work hand in hand with the agricultural activities. Surface mining will be rehabilitated and once all procedures are done the land will be suitable for agricultural activities to take place again. where mining activity will be occurring underground, the agricultural activities will continue without any hindering effects. The mine will be of great benefit to the Grapan people as they are the immediate affected people, thus many jobs will carter for them and also SMME's will be sourced from the locals where possible to ensure that they grow and also ensure that unemployment critics are minimized.	
Sinokwanda Agriculture and Mining Co Operative (Lawful Occupiers)	X	12/09/2019	Sinokwanda Agriculture and Mining Co Operative requested a meeting. A meeting was held between the Sinokwanda Agriculture and Mining Co Operative committee members, IBT&M and Singo Consulting. The purpose of the meeting was to clarify information in the consultation report about the lawful occupiers of Portion 10 of Farm Graspan 222 IS. The committee members requested that they should be referred to as a collective and thus addressed as a collective in the consultation report. We were told of people wanting to claim the land and to rectify the report as they had documentation. Refer to appendix 9.		Appendix 12
Mrs. T. M. Mahlangu zonkewonke@webmail.co.za 060 646 9517	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr. P.B. Magagula 060 628 6232	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mrs. C. N. Magagula 083 218 2807	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		**Date comments received**	**Issues raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference** In this report where issues and/or responses were incorporated
Mrs. J.N Mgutshana 072 012 5361	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mrs. L Manzini 082 371 9255	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mrs. M.C. Mofokeng 076 237 7468	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mrs. M.P. Mahamba 064 611 4622	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr. S Mathibela	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mrs. Irene **079 229 7448**	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr. R. T. Motsoene	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr. C Sindane	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr. B Mtsweni	X	02/11/2018	Register me as an I&AP	Singo Consulting has Acknowledged your request and you are now registered as an I&AP.	Appendix 4
Mr J Msholoo Cell: 071 359 2810	X	11/10/2018	According to a telephone communication that was held on the 11-10-2018 between Mr. H Skosana and EAP- Rudzani Shonisani, it was discovered that there's no email address that the EAP can send the documents to, however it was declared that it shall	On the 15-10-2018, the EAP made it an effort to call again and alert the landowner of the meeting that will be held at Hendrina on the 16-10-2018. Mr jabu sent someone to participate on his behalf.	Appendix 4

I&APs List the names of persons consulted in this column. Mark with an X where those who must be consulted were in fact consulted.		Date comments received	Issues raised	EAPs response to issues as mandated by the applicant	Section and paragraph reference In this report where issues and/or responses were incorporated
			be found and communicated back for further process		
	X	05/07/2019	According to a telephone communication that was held on the 11-10-2018 between Mr. J Mshololo and Junior Consultant - Nokuthula Nkosi it was discovered that there's no email address that the consultant can send the documents to, however it was declared that it shall be found and communicated back for further process.	On the 05/07/2019, the Junior Consultant – Nokuthula Nkosi made it an effort to call again and alert the lawful Occupier of the meeting that will be held in Davel on the 12-07-2019.	
	X	22/07/2019		On the 22/07/2019, Junior Consultant – Nokuthula Nkosi called Mr. Mshololo again to alert him of the outstanding email. He said he would allocate a person who will receive emails on his behalf. (Mr Mshololo has not reverted to date, with an email address nor physical address where Singo Consulting can send the BID and other supporting documents)	
Government departments					

Steve Tshwete Local Municipality **Mr. Eric** ericr@stlm.gov.za **Mr. Desmond** desmondm@stlm.gov.za **Mr. Mduduzi** Mduduzim@stlm.gov.za **Mrs. P Moswathupa** peralm@stlm.gov.za	X	11/10/2018	Kindly note that I read your email with interest and according to the information provided the farm Graspan 222 IS falls within the magisterial district of hendrina which is under the jurisdiction of Steve Tshwete Local municipality, Nkangala District Municipality. However, the acceptance letter from Department of Mineral Resources state that the property falls within the magisterial district of Ermelo which is a different district altogether. Therefore clarity must be given with regard to the district and local municipality in which the property falls and relevant municipality must be consulted in that regard. Please send me the report for review	Pardon me for my mistake, I had done several searches with the help from the client and they were showing me that the farm Graspan 222 IS, portion 10 is part of Middleburg, Ermelo and Bethal magisterial district. That is when I thought automatically falls under Steve Tshwete as it is a few Kilometers from Hendrina town. It is only now that I am aware of the confusion and found clarity to the matter above.	Appendix 6
	X	15/10/2018		A draft was sent to Kagiso for review on the 01-11-2018	
	X	17/10/2018	Could you kindly send me the BAR so that I can make comments	A draft was sent to Pearl for review on the 01-11-2018	
	X	13/09/2019		An email stating that the Municipality needs to be consulted as Hendrina is within 30 km radius from the proposed project area, therefore they are requested to revert with comments. Draft EIA, comment form and locality map was sent as attachments.	Appendix 5
	X	17/09/2019	Mr. Desmond requested that the attached documents be sent to his personal email address so that he can view them. (mohalekagiso1@gmail.com)	Consultation emails were bouncing due to the space limitations of the email address. Mr Desmond reverted with his personal email address to receive the documents.	
	X	18/09/2019		An email with Draft EIA, Comment Form and Locality map as attachments was sent to Mr. Desmond using the provided	

				email address.	
	X	25/09/2019		A reminder email stating that documents had been sent to the given email address and that comments are due was sent to Mr. Desmond's work email.	
	X	30/09/2019		A closure email was sent Mr. Desmond notifying him that commenting had lapsed.	
Msukaligwa Local Municipality **Mr. D Stander (2018)** dstander@msukaligwa.gov.za **Mr. Zwane (2019)** bzwane@msukaligwa.gov.za 017 801 3504 **Mr. S Mduli (2019)** smdluli@msukaligwa.gov.za	X	22/10/2018	No comments have been received yet.	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder.	Appendix 6 Appendix 5
	X	11/09/2019		A reminder email, with the draft EIA report and comment form was sent stating that they should revert before the expiration date was sent to Mr. Zwane (Municipal Manager) and Mr. S Mdluli(Development).	
	X	12/09/2019		Junior consultant, Nokuthula Nkosi called the municipality and reached Mr. S Mdluli who said he will review the document sent on the 11/09/2019. Mr. Zwane was not available. On 13/09/2019 junior consultant made it an effort to reach Mr. Zwane and Mr. S Mdluli but had no success in reaching them.	
	X	13/09/2019		A reminder email was sent to Mr. Zwane and Mr. Mdluli On 16/09/2019, junior consultant Nokuthula Nkosi called Mr. B Zwane without any success. He is said to be back in the office on Wednesday. Mr. S Mdluli's line goes unanswered.	
	X	16/09/2019		A reminder email requesting comments was sent to Mr. Zwane and Mr. Mdluli but no response was received.	
	X	20/09/2019		A closure notification email stating that commenting had lapsed	

	X	30/09/2019		was sent to Mr. Zwane and Mr. Mdluli. (Despite efforts made, the department did not revert with their comments regarding the proposed project.)	
John Blose (Ward 10 Councillor) Mpatatablose11@gmail.com Cell: 073 281 2357	X	06/11/2018	A call was received from Mr. Blose on the 6-11-2018, raising an issue that he was not consulted and requesting a meeting.	EAP made Mr. Blose aware of the fact that an email was sent to the municipal manager's email, however no responds were received thus, a meeting will be conducted and Mr. Blose was sent the report to review and make comments.	Appendix 6
	X	16/07/2019		A consultation email along with formal apology containing BID, DMR Acceptance Letter, Regulation Map and Notification was sent as attachments was sent.	Appendix 5
	X	18/07/2019		An email reminding Mr. Blose to comment before the commenting period expired was sent.	
	X	22/07/2019		On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call the councillor and remind him to revert with him comments as they are important for report compilation as the ward 10 councillor.	
	X	25/07/2019		An email reminding the councillor to send in their comments and documentation as the commenting period was expiring was sent.	
	X	06/08/2019	A comment form was received from Mr. Blose		

			stating that the project will decrease unemployment within the area and economy upliftment.		
Govern Mbeki Local Municipality **Mr. Felani** felani.m@govanmbeki.gov.za office.mm@govanmbeki.gov.za tiffany.ramage2@gmail.com	X X X X	13/09/2019 17/09/2019 20/09/2019 30/09/2019	Ms Tiffany from Mr. Felani's office assisted by giving us her personal email to share with Mr. Felani.	A consultation email with Draft EIA, Comment Form and Locality map was sent to the department. They were notified of the commenting period. An email describing that the email was too large to send was sent to the department. Junior Consultant made it an effort to contact the office to explain the issue faced. A consultation email with Draft EIA, Comment Form and Locality map was sent to Ms. Tiffany to share with Mr. Felani. They were notified of the commenting period. A reminder email was sent to Mr. Felani to comment before the deadline. A closure notification email stating that commenting had lapsed was sent to Mr. Felani (Despite efforts made, the department has not reverted with their comments regarding the proposed project.)	Appendix 5
Department of Agriculture, Forestry and Fisheries Mr. K Mav KennethMAV@daff.gov.za	X X X	11/10/2018 05/07/2019 11/09/2019	No comments have been received	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder. A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No response has been received thus far. A reminder email, with the draft EIA report and comment form	Appendix 6 Appendix 5

				was sent stating that they should revert before the expiration date.	
South African Heritage Resource Agency an agency of the Department of Arts and Culture	X	27/09/2019		Heritage study was conducted and submitted online as part of regulation requirements in order for the organization to comment.(Refer to appendix 11 for proof of submission)	Appendix 11
Department of Water and Sanitation water & sanitation Department: Water and Sanitation REPUBLIC OF SOUTH AFRICA Mr. S Nevondo nevondoS@dws.gov.za Mr.Mbulaheni mbulaheni@dws.gov.za Mrs. N Mandlazi MandlaziN@dws.gov.za	X	11/10/2018	No comments have been received yet.	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder and also a draft scoping report was delivered to Ms. Nevondo on Friday the 2nd of November 2018(Refer to Appendix 7)	Appendix 6 Appendix 5

	x	05/07/2019	Good day Please kindly submit the hardcopy to our office. 474 Carl Street, Pretoria West. Regards	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department.	
	X		Lindelani	Acknowledgment of the request was sent to Mrs. Mandlazi.	
	X	15/07/2019	An email was received from Mrs. Mandlazi requesting a pre consultation meeting.		
	X	16/07/2019		Hydrologist, Ms. Mutshidzi reverted with a date for the requested meeting being 23/07/2019. The meeting was then postponed to 30/07/2019 telephonically. Refer to Appendix 9	
	X	18/07/2019	Documents were sent to the given address. An email alerting Mr. Lindelani that the documents were sent was sent. Confirmation from Mr Lindelani was received. (Refer to Appendix 7)		
	X	06/08/2019		A reminder was sent to MR. Lindelani to comment on the documents sent about the proposed project.No response has been received thus far. Table will be updated as soon as comments are received.	
	X	11/09/2019			
	X	13/09/2019	Mrs. Mandlazi requested a site inspection for the		

	X	13/09/2019 16/09/2019	application Mrs. Mandlazi agreed requesting directions	A reminder email, with the draft EIA report and comment form was sent to Mr. Nevondo and Mr. Lindelani stating that they should revert before the expiration date. Senior hydrologist reverted with the 25/09/2019 Directions were discussed telephonically.	
	X	25/09/2019	A Meeting was held between Singo Consulting and DWS. the DWS representatives requested to see plans and drainage lines for the mining right area and requested that additional studies be conducted by Singo Consulting. IT was agreed that there would be another meeting where DWS will communicate the steps to be followed when mining under pans. A date is to be finalised.		Appendix 12
Department of Environmental Affairs environmental affairs Department: Environmental Affairs REPUBLIC OF SOUTH AFRICA Mr. T Ramavhona (2018 & 2019) TRamavhona@environment.gov.za Mr.E.J. Nkabinde (2019) nkabindeej@emalahleni.gov.za	X	11/10/2018	No comments have been received	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder.	Appendix 6
	X X	05/07/2019 11/09/2019		A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No response has been received thus far. A reminder email, with the draft EIA report and comment form was sent to Mr. Ramavhona and Mr. Nkambinde stating that they should revert before the expiration date.	Appendix 5

Department of Labour labour Department: Labour REPUBLIC OF SOUTH AFRICA Mr. P Molapo Petermolapo@Labour.gov.za	X	11/10/2018	No comments have been received yet.	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder	Appendix 6
	X	06/07/2019		A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No response has been received thus far.	Appendix 5
	X	13/09/2019		A reminder email was sent to Mr Molapo to comment of the proposed project/draft EIA before the 30th of September.	
Department of Public Works public works Department: Public Works REPUBLIC OF SOUTH AFRICA Mr. P Mashiane pat.mashiane@dpw.gov.za Tell: 013 752 6371 Cell: 083 676 5764	X	08/07/2019		A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. Assistance with confirming that Graspan 222 IS falls under the department was requested but no response has been received.	Appendix 5
	X	09/07/2019	Good Day See below email and attached documents for your attention and further handling. kindly respond to them and copy our office on your response. Mr Masuku in absentia of Ms Mokgohloa please attend to it. Warm Regards Lebogang Mashile Acting Office Manager		

	X		Nelspruit Regional Office 013 753 6308/082 608 8052		
		22/07/2019	Ms. Mashile(Mr. Mashiane's secretary) on behalf of Mr. Mashiane forwarded my initial email to Mrs. Maphuthi who is in the property department. No response has been received from Mrs. Maphuthi thus far.	On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call and remind the department to revert with their comments and any additional information as they are important for report compilation.	
			Good Day	Acknowledgement email was sent.	
	X X		Please accept my sincere apology for the late response, however your email was forwarded to Mr Malusi Ganiso at Head Office today, his contact details are as follows: Malusi.ganiso@dpw.gov.za ,Tel 012 406 1035. Warm Regards	A consultation email was sent to Mr. Ganiso and a request was made asking him to clarify the matter raised.	
		01/08/2019	Lebogang Mashile Acting Office Manager Nelspruit Regional Office 013 753 6308/082 608 8052		

Office No. 16 First Floor (South Block), Corridor Hill Crossing 09 Langa Crescent, Corridor Hill, eMalahleni, 1040 P/Bag X7297, Postnet Suite 87, eMalahleni, 1035, Mpumalanga Province, ZA
T: 013 692 0041 F: +27 86 5144 103: admin@singoconsulting.co.za

		06/08/2019		Kindly note that your assistance in this matter is highly important. We have tried to contact you on the following number: 012 406 1035 but have not had any success. We were then directed to Mrs. Phamela on 012 406 1047, by Lebogang Mashile, who stated that you are not in the office until tomorrow. May you kindly revert so that we may get clarity on the below mentioned matter. Trust you find the above in order. (The department has not reverted but we, through communication with the applicant found that the Sinokwanda Agriculture and Mining Co Operative are the lawful occupiers and they provided documentation. The department was therefore no longer consulted.)	Appendix 10
Commission on Restitution Of Land Rights Mr. H Skhosana (2018) Harold.Skhosana@drdlr.gov.za 013 656 0848 Mr. V.K. Khoza (2018) Vusi.khoza@drdlr.gov.za Mr. S Gasa(2018)	X X X X	11/10/2018 11/10/2018 05/11/2018	There's a land claim against farm Graspan 222 IS on portion 10. Please can you advise the client on how they can do their request for the kind of information that they need as indicated on the email bellow	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder. Please assist with the procedure to be able to consult the affected parties. Waiting for responds from the Dumsani Hlongwane and Beauty Chiloane.	Appendix 6 Appendix 5

Sonwabo.Gasa@drdlr.gov.za Mrs. P Lindoor(2019) Petruscha.Lindoor@drdlr.gov.za Mr. L Masuku Lazarus.Masuku@drdlr.gov.za Ms. N Nkambule(2019) ntokozo.nkambule@drdlr.gov.za	X X X X	05/07/2019 18/07/2019 11/09/2019 18/09/2019 20/09/2019	A letter stating the farm status from the department was received from Mrs Petruscha. I have already responded to this enquiry.	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. A reminder email, with the draft EIA report and comment form was sent to Mrs. Lindoor stating that they should revert before the expiration date. Acknowledgment was sent.	
Mpumalanga Tourisim **Komilla Knarasoo (2018)** Komilla.Knarasoo@mtpa.co.za **Khumbelo Makhuvha (2018)**	X	11/10/2018	Please forward hard copy documents to our head office. Mpumalanga Tourism and Parks Agency Attention: Komilla Narasoo Halls Gateway on N4 Block G Room 25 Mbombela	Documents sent via courier. 01-11-2018, the document was sent to Khumbelo for review. (See prove of submission Appendix 7).	Appendix 6

Office No. 16 First Floor (South Block), Corridor Hill Crossing 09 Langa Crescent, Corridor Hill, eMalahleni, 1040 P/Bag X7297, Postnet Suite 87, eMalahleni, 1035, Mpumalanga Province, ZA
T: 013 692 0041 F: +27 86 5144 103: admin@singoconsulting.co.za

khumbelomakhuvha940@gmail.com] Ms. T Lunanga (2019) thanduxolo.lubanga@mtpa.co.za Ms. P Nkosi(2019) phumla.nkosi@mtpa.co.za	X X X X X	06/07/2019 26/07/2019 16/08/2019 11/09/2019 27/09/2019	Please deliver a hard copy of the document as the MTPA 's policy is to receive only hardcopies of any EIA related documents. They can be delivered to our office in Nelspruit. The address is: MTPA N4 Halls Gateway, Mataffin, Nelspruit 1200 Attention: Phumla Nkosi, Block G; Room 3D A letter was received from Mr. J.J Eksteen (Manager Scientific Service) stating that specialist reports should be updated and accurate.(Refer to Appendix 5)	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No comments have been received thus far. The table will be updated once comments are received. Confirmation email to do as requested was sent. 19-08-2019, the document was sent to Phumla Nkosi for review. (See proof of submission Appendix 11). A reminder email, with the draft EIA report and comment form was sent to Ms. Lungana and Ms Nkosi stating that they should revert before the expiration date. Specialist studies were updated accordingly as per request.	Appendix 5 Appendix 11 Appendix 5
Biodiversity Planning Ms. M Lotter Mervyn@intekom.co.za	X X	11/10/2018 06/07/2019	Scoping was approved by Mpumalanga Tourism and Parks; it was mentioned that a full EIA report must be submitted on completion.	ID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department.	Appendix 6 Appendix 5

	X X X X X X X	17/07/2019 05/08/2019 06/08/2019 11/09/2019 13/09/2019 23/09/2019 25/09/2019	Attachmed maps indicating the terrestrial and freshwater biodiversity importance, as well as a list of species of conservation concern known to occur in the broader area. Please note that this communication is not a response to your intent to prospect, but merely supplying you with maps highlighting the biodiversity importance from information that has been gathered to date. Email was forwarded to Mr. Frans Krieg Acknowledgment was sent by Mr. Krieg of MTPA	An email reminding the Ms. Lotter to send in their comments and documentation as the commenting period was expiring was sent. Acknowledgment was sent to Ms. Lotter. A reminder email, with the draft EIA report and comment form was sent stating that they should revert before the expiration date. A reminder email was sent to remind Ms Lotter to revert with comments before the 30/09/2019. A reminder email was sent requesting comments before the 30th of September 2019.	Appendix 5
Eskom	X	11/10/2018	No Comments have been received as yet.	BID, DMR letters and Google earth view were sent as part of the consulting email to the stakeholder	Appendix 6

Eskom Mr. M Wayleaves wayleavesmou@eskom.co.za T Tshifularo Land and Rights Negotiations Land Development Eskom Distribution MOU Tell 013 693 2562 Fax 086 605 3668	X X X	05/07/2019 22/07/2019 11/09/2019	An attachment stating that Eskom is not affected by the application was received.	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. An Acknowledgement email was sent to Mr. Tshifularo. A reminder email, with the draft EIA report and comment form was sent to Mr. Wayleaves and Mr. Tshifularo stating that they should revert before the expiration date.	Appendix 5 Appendix 5
SANRAL Mr. J Oliver oliverj@nra.co.za	X X X	05/07/2019 17/07/2019 26/07/2019	An attachment stating that Sanral is an interested and affected party due to national roads N11 and R38 was received. IBM&T will have to have an agreement with SANRAL on how they will	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. An email reminding the Mr. Oliver to send in their comments and documentation as the commenting period was expiring was sent.	Appendix 5

	X 06/08/2019		upgrade the roads upon granting of the mining right. Traffic Impact Assessment was requested.	Traffic Impact Assessment was sent as per request.	
SANBI Mr. D Moshe D.Moshe@sanbi.org.za	X X 11/09/2019	05/07/2019	No comments have been received yet however SANBI share files have been used to create sensitivity maps.	A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No comments have been received from the department thus far. The table will be updated when comments are received. A reminder email, with the draft EIA report and comment form was sent stating that they should revert before the expiration date.	Appendix 5
Transnet Mr. Y Chabalala Yuza.Chabalala@transnet.net Mrs. M Mokoena Mothofeela.Mokoena@transnet.net	X X X X	11/10/2018 05/07/2019 06/07/2019 11/09/2019	Incorrect person was consulted. We were referred to the relevant person Mr: Ndivhuwo Netshilaphala of Transnet Freight Rail JHB by Mr. Mothofeela	Waiting for response. A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No response was received thus far. Table will be updated as soon as comments are received. A consultation email with BID, DMR Acceptance Letter and Regulation Map as attachments was sent to the department. No response was received thus far. Table will be updated as soon as comments are received. A reminder email, with the draft EIA report and comment form was sent to both parties stating that they should revert before	Appendix 6 Appendix 5

				the expiration date.	
Other Interested and Affected Parties					
Mr. D Mahamba mahamba5.di@gmail.com **072 803 8180**	X		Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Lusanda Sky Rope Access (Pty) Ltd	X	24/10/2018	Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Gebudla Enterprise	X	24/10/2018	Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Mr. S Mazibuko	X	24/10/2018	Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Mr. G Malinga	X	24/10/2018	Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Mr. S Malinga	X	24/10/2018	Register me as an I&AP	Junior Consultant Registered interested and affected party.	Appendix 8
Jabu Manana (MCC) jabumanana.40.@gmail.com Cell: 071 906 4910	X X	16/07/2019 16/07/2019		A consultation email along with formal apology containing BID, DMR Acceptance Letter, Regulation Map and Notification was sent as attachments was sent. Junior Consultant Nokuthula Nkosi made it an effort to call Mr. Manana to get a working email address but had no success.	Appendix 8 Appendix 7
Justice Mkhaliphi (DBA) justice.mkhaliphi@gmail.com **Cell: 060 932 7313**	X X	22/10/2018 20/06/2019	They had seen an advert and had interest in the project however needed to make it clear that the project falls under ward 10 and requested a meeting with the community at large on the 7th of November 2018. A notification email was sent to Mr. Mkhaliphi stating that the next phase of the application had commenced.	EAP acknowledged the request.	Appendix 8 Appendix 7

	X X X X	28/06/2019 22/07/2019 25/07/2019 06/08/2019	Attached herewith please find the invoice with a balance from your last payment and the quotation for the next phase of the public participation meeting which is set for the 05th of July 2019. A comment form was received from Mr. Mkhaliphi stating that there will be employment and economic development within the area	Acknowledgement was sent to Mr. Mkhaliphi. On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call the stakeholder and remind him to revert with his comments as they are important for report compilation. An email reminding the Mr. Oliver to send in their comments and documentation as the commenting period was expiring was sent. On the 06/08/2019, junior consultant-Nokuthula Nkosi called Mr. Mkhaliphi to remind him to revert he then stated he would meet with MR. Manana and they will send through their comments as stakeholders.	Appendix 7
Mr. N.E. Mavimbela nathimav85@gmail.com 063 603 7465	X	06/08/2019	Find employment. I expect the project to provide employment to the youth as they are mostly unemployed and to provide skills to those who need it and ultimately employ the people who were provided with skills.	Junior Consultant Registered interested and affected party.	Appendix 7
Mr. S Thango spmthango@gmail.com 083 859 9366	X	06/08/2019	A comment form was received from Mr. Thango stating that as business people they must be considered first if any business opportunities rise.	Junior Consultant Registered interested and affected party	Appendix 7
Gilbert Mahamba (Graspan 222 IS Representative)	X	16/07/2019		A consultation email along with formal apology containing BID, DMR Acceptance Letter, Regulation Map and Notification was	Appendix 7

zamagabane702@gmail.com Cell: 076 052 5785				sent as attachments was sent.	
	X	18/07/2019		An email reminding Mr. Mahamba to comment before the commenting period expired was sent.	
	X	22/07/2019		On the 22/07/2019, junior consultant- Nokuthula Nkosi made it an effort to call the lawful occupier and remind him to revert with his comments as they are important for report compilation.	
	X	25/07/2019		An email reminding the lawful occupier to send in their comments and documentation as the commenting period was expiring was sent.	
	X	06/08/2019		On the 05/08/2019, junior consultant – Nokuthula Nkosi called the lawful occupier to remind him to revert with his comments. He stated that he was unable to print the attached document and requested that it be faxed to him. The BID was faxed on 06/08/2019.	
	X	08/08/2019	A comment form was received from Mr. Mahamba. Stating that the IBM&T should have royalties for I&AP and that there are livestock and cemeteries on the proposed area that he is concerned about.		Appendix 7
	X	13/09/2019	Mr. G Mahamba expressed his concerns telephonically. According to information shared by Sinokwanda Agriculture and Mining Co Operative Mr. Mahamba and Mr. Simelane are not lawful occupiers of Farm Graspan 222 IS portion 10. After hearing about the meeting with Sinokwanda Agriculture and Mining Co Operative, Mr Mahamba contacted Junior Consultant Nokuthula Nkosi stating that he is also a lawful occupier. He stated that he has documentation to which we asked he would send to us. We are still waiting for the documents		

N.B ''Please note that a full consultation report is included separately from this report as appendix 24.''

9.1.6.3 The Environmental attributes associated with the sites

Baseline Environment

a) Type of environment affected by the proposed activity.

10 GEOLOGY

10.1 Regional geology

South Africa's Coal Resources are restricted to the area east of the longitude 26° E and are hosted by the Late Carboniferous to middle Jurassic sedimentary deposits of the Karoo Supergroup (320-180 Ma).

Within the main Karoo Basin, coal is hosted in the Vryheid Formation of the Ecca Group, where rank increases eastwards, as well as in the Emakwezini Formation of the Beaufort Group.

South Africa is host to 19 coalfields which encompass a total area of about 9.7 million hectares. The largest of these coalfields by coal reserves are the Highveld and Witbank coalfields, followed by Ermelo and Waterberg where bituminous coal predominates. South Africa's coal seams are characteristically thin and are found at relatively shallow depths and extraction is thus easier and often more economical.

South Africa's coal deposits form part of the Permian age Karoo Supergroup which was deposited on the Gondwanaland Supercontinent. The main Karoo Basin is underlain by the Kaapvaal Craton in the north and the Namaqua-Natal Metamorphic Belt in the south. The Karoo Supergroup from the base upwards is sub-divided into the following subgroups from bottom to top as:

- ❖ Dwyka Group,
- ❖ Ecca Group,
- ❖ Beaufort Group,
- ❖ Molteno Formation,
- ❖ Elliot Formation,
- ❖ Clarens Formation,
- ❖ Stormberg Group.

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The vast majority of coal beds occur in the Ecca Group with some minor coal seams in the Beaufort Group and the Molteno Formation as well (see figure for coalfields).

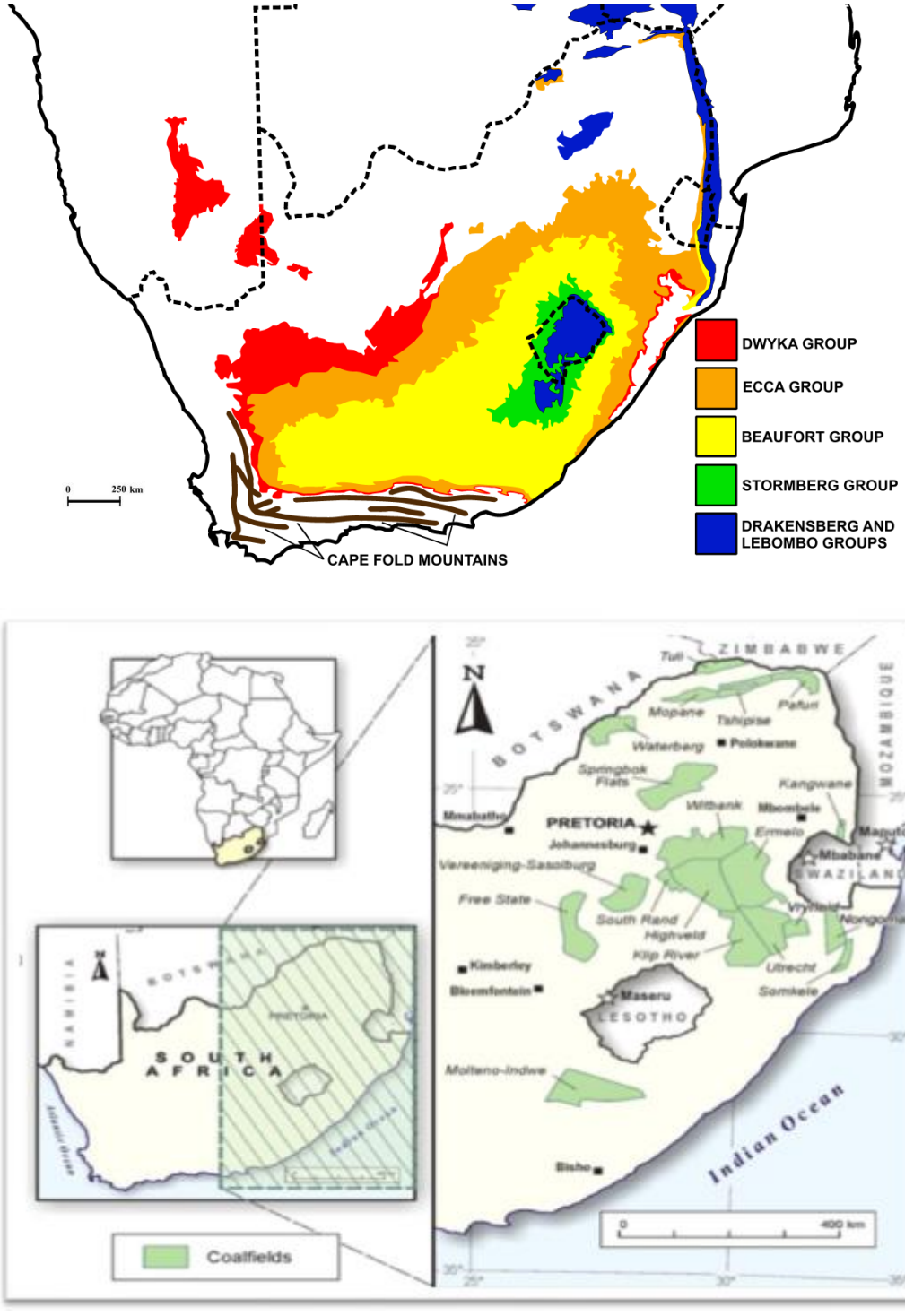

Figure 25: Geological map of the known preserved Karoo Basin in South Africa and adjacent areas (adapted from Catuneanu et al., 2002) and Coalfield of South Africa Map.

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10.2 Local geology

The basement and Dwyka Group are unconformably overlain by the coal bearing Vryheid Formation of the Ecca Group comprising the six recognised coal seams separated by sedimentary packages consisting mainly of sandstone and thinly laminated siltstone with subordinate mudstone and shale. The lithological units are variable in thickness. Basically, the local geology of the project area is entirely covered by the Vryheid formation. The dominant rocks of the Vryheid formation that can be found are; sandstones together with subequal or subordinate mudrock/rhythmite. The base of an idealised coarsening upwards deltaic cycle in the eastern part of the Vryheid formation consists of dark grey, muddy siltstone resulting from shelf suspension deposition in anoxic water of moderate depth.

The coal seams originated as peat swamps developed on broad abandoned alluvial plains and, less commonly in interfluves (backswamps). Most of the economically important coal seams occur in the fluvial succession. The fluvial interval grades into deltaic sediments towards the southwest. The Vryheid formation can be subdivided into a lower fluvial -dominated deltaic interval, a middle fluvial interval and an upper fluvial-dominated deltaic interval in the east. These subdivisions correspond approximately to the lower sandstone, coal zone and upper sandstones.

10.2.1 Local Geology coal seams.

- Ermelo Coalfield

The Ermelo Coalfield is located in the districts of Carolina, Dirkiesdorp, Hendrina, Breyten, Davel, Ermelo and Morgenzon in the southeast Mpumalanga Province. It extends approximately 75 km east–west, and 150 km north–south, covering an area of about 11,250,000 ha. The northern and eastern boundaries of the Ermelo Coalfield are defined by the sub-outcrop of the coal-bearing strata against pre-Karoo basement. In the west, the Ermelo Coalfield shares a boundary with the Witbank and Highveld coalfields, and to the south with the Klip River and Utrecht coalfields of KZN (Greenshields, 1986). Between the Ermelo and westernmost part of the Highveld Coalfield there is an area of poor (thin) coal development where no coal mining takes place.

The project falls under the Vryheid formation and the rocks of the Permian Vryheid Formation and Jurassic aged dolerites dominate the surface exposures of the coalfield. The Vryheid Formation is underlain by the Dwyka Group and is gradually overlain by mudstones (and shale) and sandstones of the Volksrust Formation. The typical colours for the Vryheid Formation are grey and yellow for the sediments and black for the coal seam. The thickness of the grey shale can vary and this is interlayered with the also variable yellow

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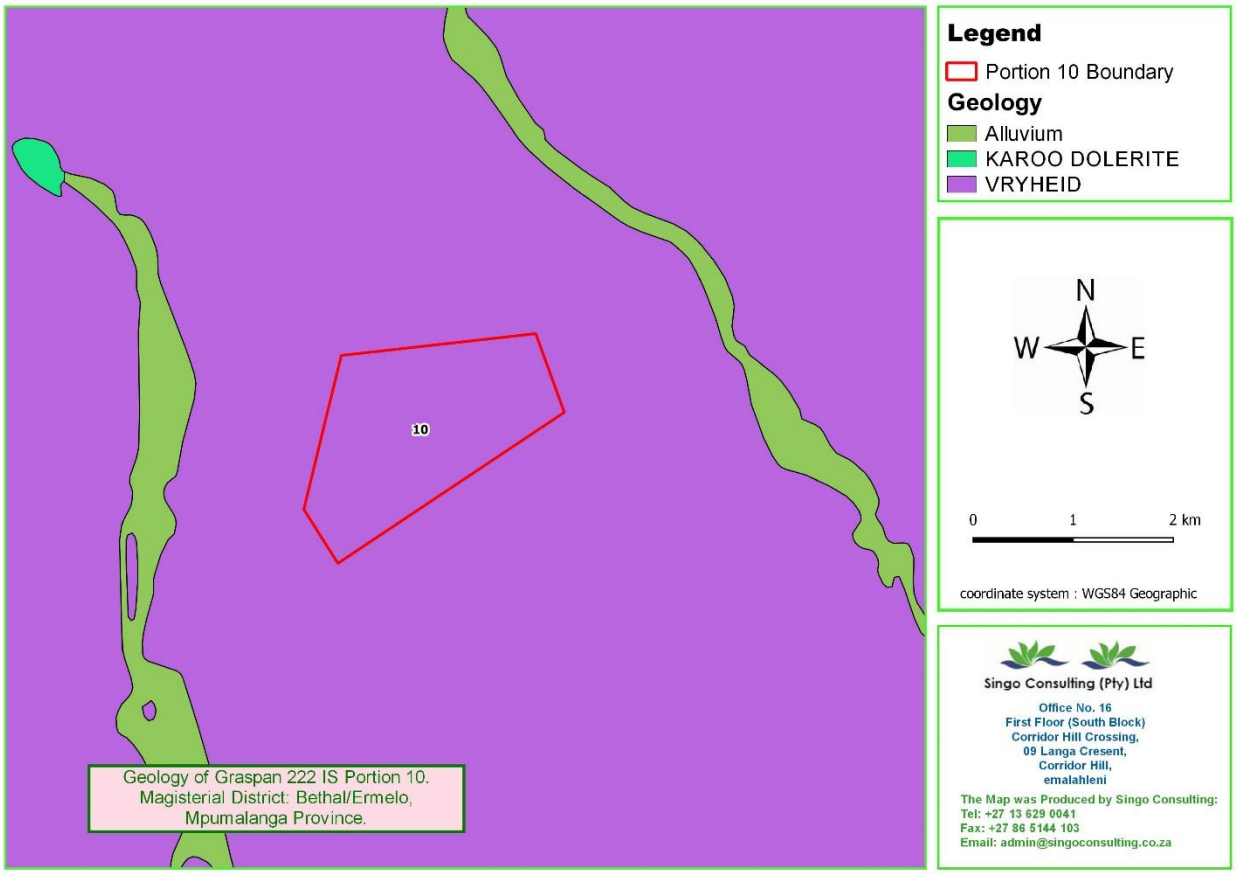
sandstone and coal seams. In the Ermelo Coalfield, the thickness of the Vryheid Formation varies between 170 and 350 m (Greenshields, 1986) and as mentioned above contains five coal seams. Two stratigraphic marker horizons occur within the sequence that may be useful in exploration drilling (Stavrakis, 1991). These are a glauconitic sandstone unit, which overlies the B Seam package, and the bioturbated Siphonicnus-zone that occurs below the C Seam and which may be used as a marker to terminate exploration drilling. Wakerman (2003) documents a 3m thick E "shale" marker (a sandy bioturbated mudstone) in the floor of the E Seam, which he felt made a prominent end of hole (EOH) marker when the D and E seams are being targeted. The overlying Volksrust Formation is only present along the western and southern escarpment areas, where it can achieve a thickness of up to 106 m (Greenshields, 1986). (See lithology, Super group and stratigraphy map below).



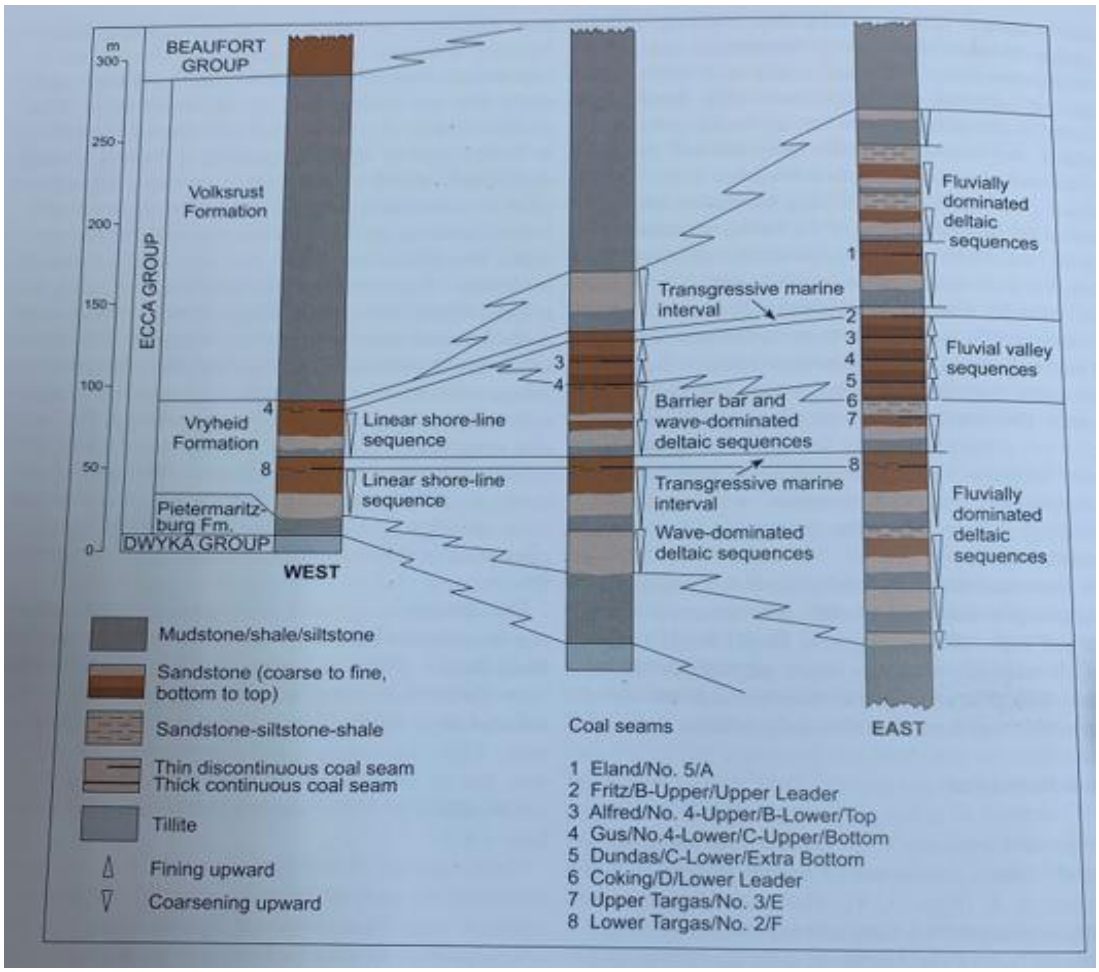


Figure 26: Local geology map (Above) and the stratigraphy section (Below) of the area of interest.

10.2.2 Coal seam geology

The coal seams in the Ermelo Coalfield are generally flat-lying to slightly undulating and as for the Witbank and Highveld coalfields, are separated by fine- to coarse-grained sandstones, siltstones and mudstones. The A, D and E seams are usually too thin to be of economic interest and historically the C Seam group was the most important in the Carolina–Breyton area, and the B Seam group in the Ermelo area. Rapid seam thickness variations characterise the coalfield.

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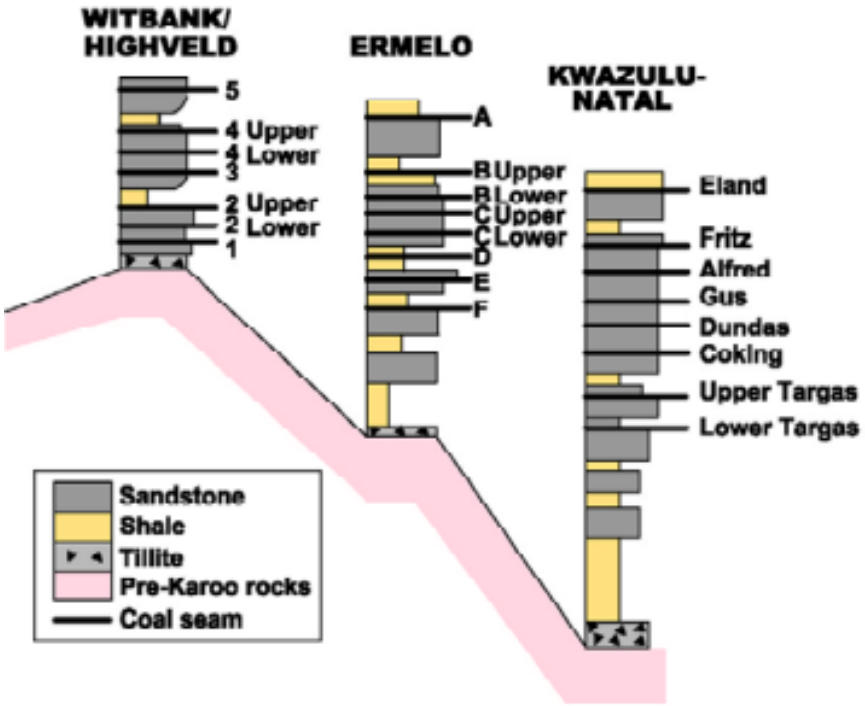

Figure 27: The figure depicts the lithostratigraphic column of the Coalfield.

10.2.2.1 The E-Seam

The E-Seam in the project area was only intersected at a depth of 117m in boreholes GPD001 and was only developed as bright bands subdivided in the sequence with interlayer of sandstone and silt. The E-seam in other boreholes is also developed as a torbanitic or as a carbonaceous siltstone or mudstone unit.

10.2.2.2 The D-Seam

The D-Seam in the project area was only intersected at a depth of 113m at an average thickness of 0.16m with a carbonaceous silt at the footwall. The coal is also only developed or intersected at borehole GPD001 in the project area.

10.2.2.3 The C-Seam

The C-Seam in the project area was intersected in all four boreholes and mostly at an average depth of 81m. The average thickness of the C-seam ranges between 1.54m to 4.42m combined with C-Upper and C-Lower as observed on the four completed boreholes. The CU and CL Seams are also well-developed in the all the borehole although not logged properly on the current project.

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10.2.2.4 The B-Seam

The B-Seam was also intersected in both four boreholes in the project area at an average depth of 20m. The average thickness of the B-Seam is approximately 0.65m for the four boreholes in Graspan Coal Project. The B-seam was split into two in the project area namely B1-Seam. The B1-Seam was only intersected in two boreholes in the property, GPD001 and GPD004.

10.2.2.5 The A-Seam

The A-Seam was only intersected in borehole GPD002 at a depth of 32.12m and has a coal thickness of approximately 0.6m in the project area. The borehole was drilled at higher topography as compared to the others hence the reason for the intersection on the seam.

The logging results of drilling conducted in the area of interest confirms the desktop studies with regards to the coal seams (the results are displayed in the following Table).

Table 8: Images of the core that were done during the prospecting phase

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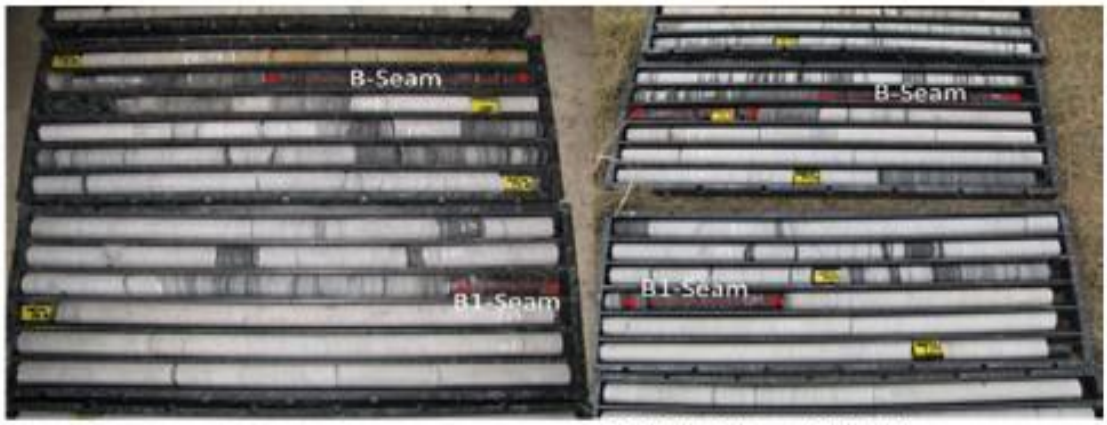
GPD001: C-seam (CU, C and CL) GPD002: C-Seam (CU, C and CL)



GPD001: B-seam (B &B1) GPD004: B-Seam (B &B1)

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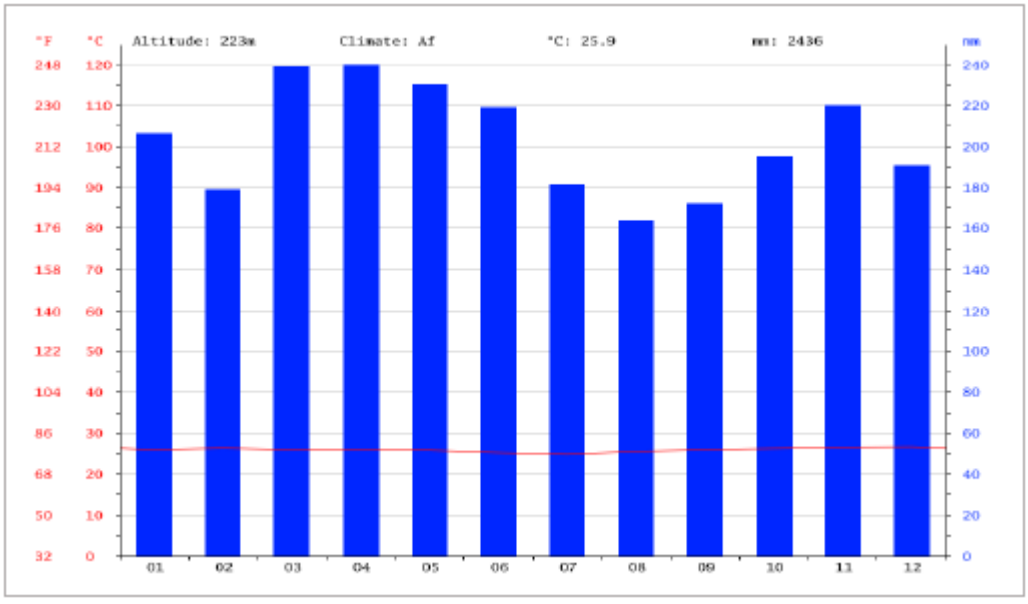
10.3 Climate

Ermelo normally receives about 625mm of rain per year, with most rainfall occurring during summer. It receives the lowest rainfall (1mm) in June and the highest (112mm) in January. The monthly distribution of average daily maximum temperatures shows that the average midday temperatures for Ermelo range from 15.8°C in June to 24.1°C in January. The region is the coldest during June when the mercury drops to 0.2°C on average during the night.

Graspan falls under the central Mpumalanga climatic zone characterized by warm, rainy summers and dry winters with sharp frosts. Rainstorms are often violent (up to 80mm per day) with severe lightning and strong winds, sometimes accompanied by hail. The winter months are droughty with the combined rainfall in June, July and August making up only 3, 9% of the annual total (734mm).

The average daily maximum temperature in January (the hottest month) is 25, 2°C and in July (the coldest month) is 16, 7°C (see Figure below) and the rain fall is approximately 601-800mm above sea level. Due to its position near the escarpment, the area is somewhat windier than is typical for the South - Eastern Mpumalanga Highveld, although the majority of winds are still light, and their direction is controlled by topography (Msukaligwa LM Spatial Development Framework, 2010). (See rainfall below).



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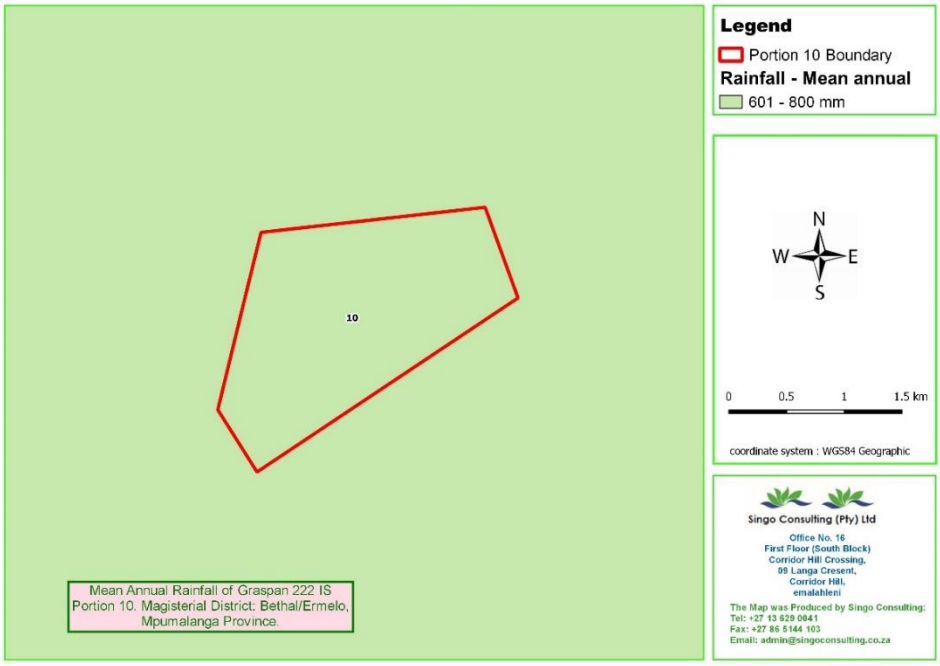
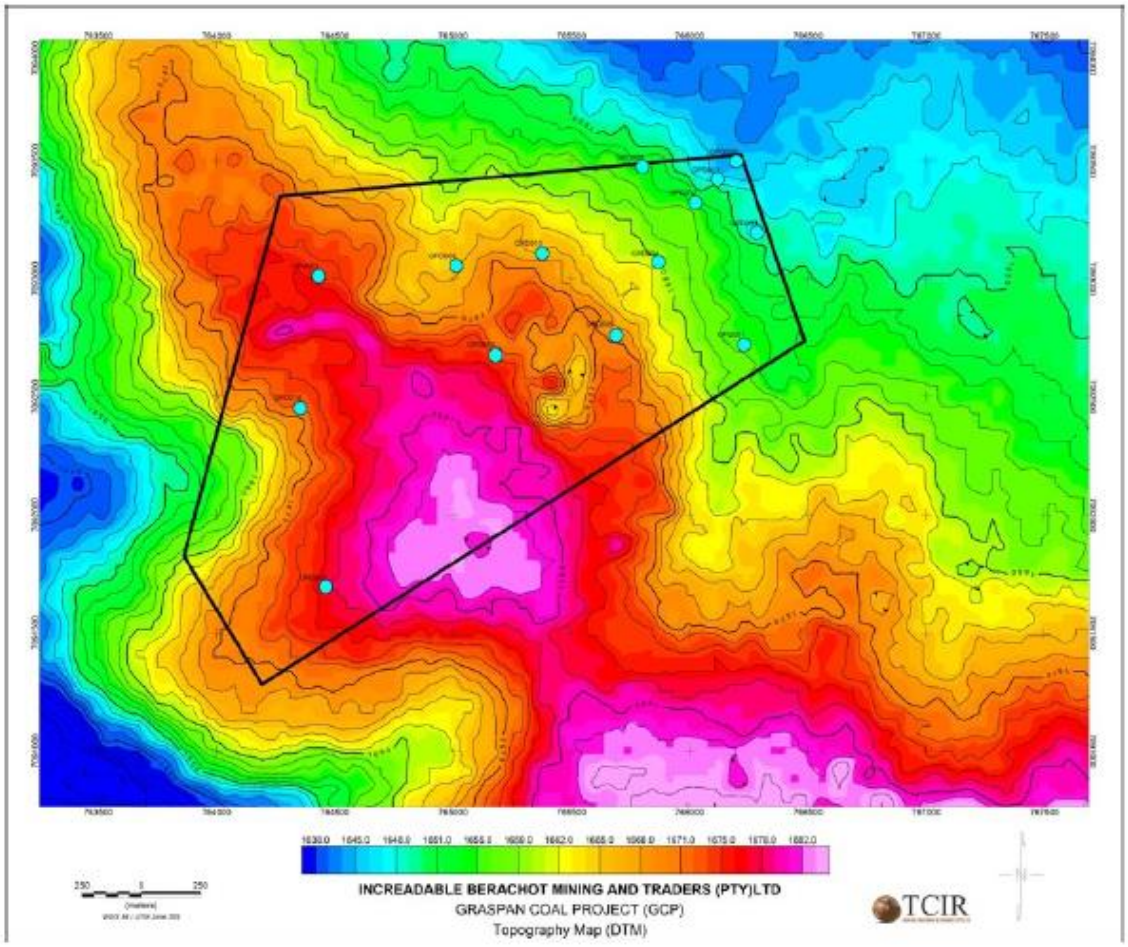


Figure 28: Rainfall Graph (Above) and Map (Below) in Ermelo.

10.4 Topography

Graspan is characterized by the gently undulating highland topography with fairly broad to narrowly incised valleys of headwater drainages as it falls within the Msukaligwa local municipality. The surrounding areas are also characterized by typical Highveld landscapes in the western and central parts, and more undulating terrain with dense commercial forests in the eastern parts. Interesting landscapes are found in the Chrissiesmeer panveld area. (See figure of Topography for the area).



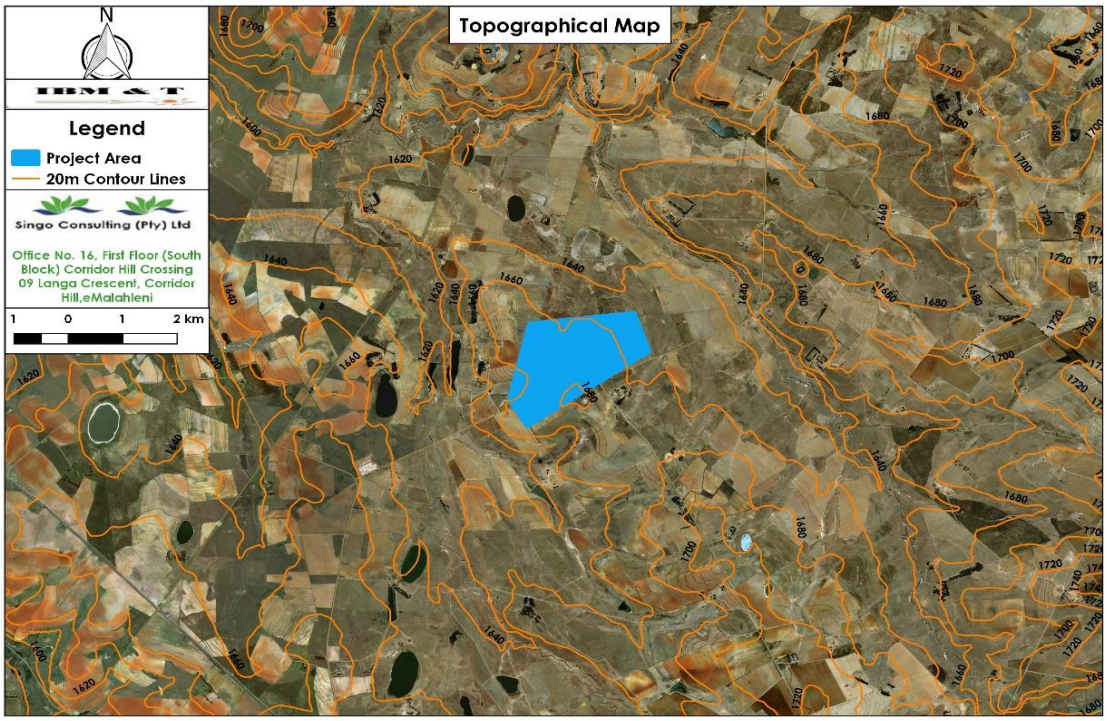


Figure 29: 20m Contour maps of the project area.

10.5 Regional Rainfall

Rainfall Data for the site was obtained from the WR2005 study (Middleton and Bailey, 2009), the Rainfall Extraction Utility Programme (Kunz, 2004) and the Design Rainfall Estimation Program (Smithers and Schulze, 2002). The daily rainfall extraction utility contains daily patched rainfall data for all official South African Weather Services stations. The rainfall stations considered were close to the site, had a reasonable length of record and a relatively complete and reliable data set. Please see Table 8 and Figure 29 below. Vlaklaagte Pol (0479225_W) was selected for use in the study. The station is located about 1.8km from the site at a similar altitude and thus represents local rainfall conditions.

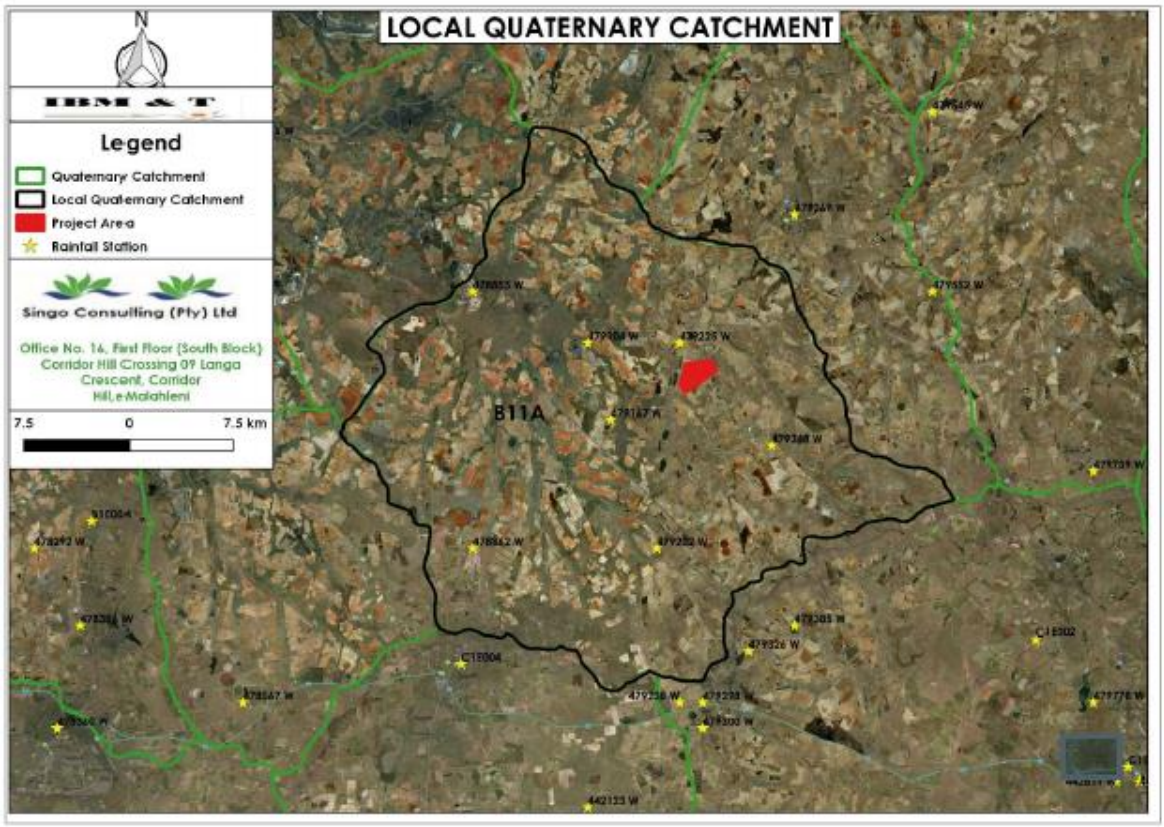


Figure 30: Rainfall

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Table 9: Rainfall stations considered

Station Name	SAWS Number	Distance from site (km)	Record Length (years)	Mean Annual Precipitation (mm)	Altitude (m AMSL)
VLAKLAAGTE	0479225_W	1.8	70	680	1640
BANKPAN	0479167_W	6.5	41	716	1648
WELTEVREDEN	0479104_W	7.4	39	698	1617
TEVREDEN	0479348_W	9.0	47	693	1685
GIPSY HILL	0479202_W	12.7	51	727	1683
HENDRINA (MUN)	0479369_W	14.1	49	681	1682

The Smithers and Schulze method of DDF rainfall estimation is considered more robust than previous single site methods. WRC Report No. K5/1060 provides further detail on the verification and validation of the method. Also, for comparison purposes, rainfall depth estimates for the site using the Hydrological Research Unit (HRU) methodology (WR2005) have also been undertaken for the 24-hour duration event of various return periods (as presented in the last line of Table 2-3). The HRU methodology is a simplistic methodology which enables the estimation of DDF rainfall based on the MAP for the site (592 mm) and a site location factor in order to determine the DDF estimate. Comparison of the 24-hour rainfall depths estimated by each methodology indicates that the Smithers and Schulze method is higher than the HRU method estimates for all events except for the 1:200-year event.

Table 10: Depth duration frequency estimates for the site

Duration (hours)	Rainfall Depth (mm)						
	1:2yr	1:5yr	1:10yr	1:20yr	1:50yr	1:100yr	1:200yr
0.08	8.9	11.8	13.9	15.9	18.8	21.1	23.4
0.167	12.9	17.0	20.0	23.0	27.1	30.4	33.8
0.25	15.9	21.1	24.8	28.5	33.6	37.7	41.9
0.5	20.4	27.0	31.7	36.5	43.0	48.2	53.6
0.75	23.6	31.2	36.7	42.2	49.7	55.7	61.9
1	26.1	34.6	40.6	46.7	55.1	61.7	68.6
1.5	30.1	40.0	46.9	54.0	63.6	71.3	79.3
2	33.4	44.3	52.0	59.8	70.5	78.9	87.8
4	39.8	52.8	62.0	71.3	84.1	94.2	104.7
6	44.2	58.5	68.7	79.1	93.2	104.4	116.1
8	47.5	63.0	74.0	85.1	100.3	112.3	125.0
10	50.3	66.7	78.3	90.0	106.1	118.9	132.3
12	52.7	69.8	82.0	94.3	111.2	124.6	138.6
16	56.7	75.2	88.3	101.5	119.6	134.0	149.1
20	60.0	79.5	93.4	107.4	126.6	141.9	157.8
24	62.8	83.3	97.9	112.5	132.7	148.6	165.3

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10.5.1 Average evaporation and rainfall

The table below shows the monthly rainfall and evaporation situation around the site, the rainfall around the site is 723.0 mm/year with evaporation of 2 067.2 mm/year.

Table 11: Monthly rainfall and evaporation

Month	Rainfall (mm)	Lake Evaporation (mm)
Jan	108.7	207.1
Feb	81.5	178.3
Mar	80.9	165.6
Apr	38.0	135.7
May	11.1	122.1
Jun	8.7	91.5
Jul	2.2	105.1
Aug	9.0	141.1
Sep	23.7	182.8
Oct	97.6	198.4
Nov	122.3	198.4
Dec	134.4	204.6
Total	**723.0**	**2 067.2**

10.6 Wind

Wind is a common feature around Ermelo, but extreme wind that can destroy property is very rare. The expected wind speed is shown in the following figure.

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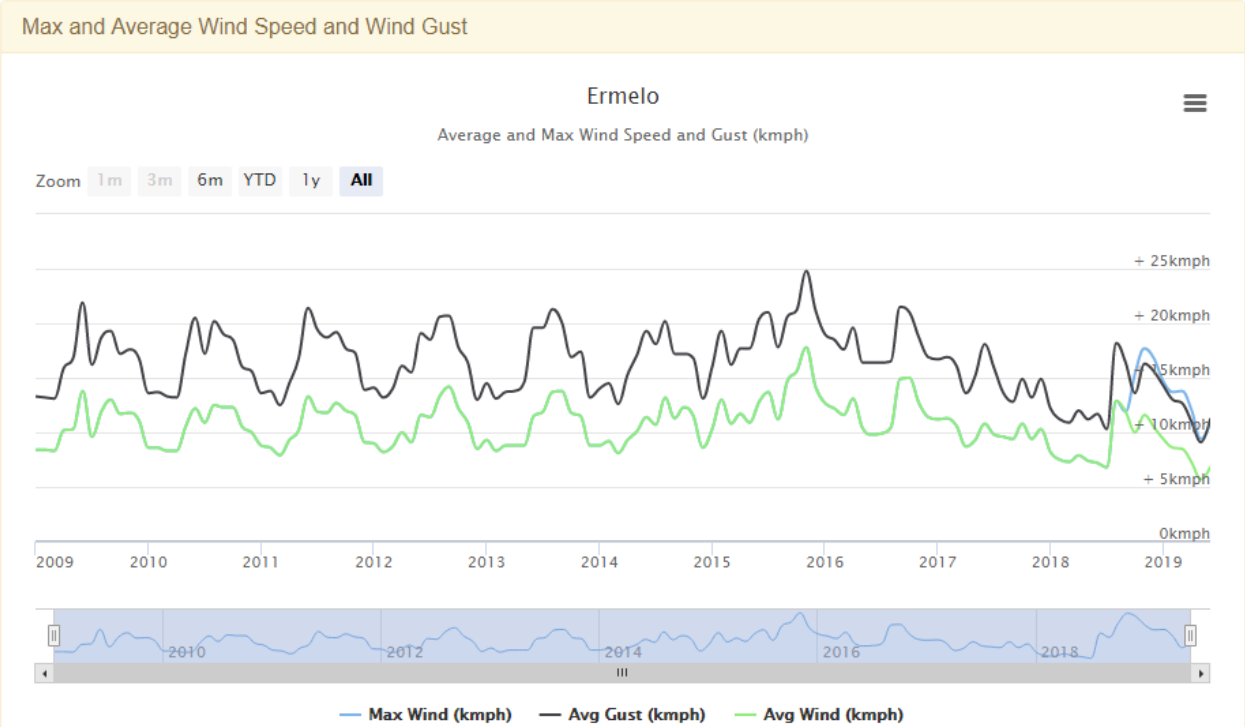

Figure 31: Yearly windspeeds

10.7 Regional Soil

A specialist soul study was conducted by Singo Consulting and according to the report attached in appendix 19.The soils are classified into broad classes according to the dominant soil form and family (Table 11) over the proposed mine infrastructure areas, and include:

• Red apedal soils of the Hutton soil and Bainsvlei form;

• Yellow-brown apedal soils of the Avalon form.

Table 12: Soil classes

Portion	Soil name	Soil depth	Soil Code	Area (ha)	Area (%)
	Bainsvlei	900 -1200 mm	Bv	1981.9	82.34
	Avalon	600 mm	Oa/Va	5.8	0.24
	Hutton	900 – 1200 mm	Hu	13.5	17.42
Total				2407	100

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Hutton (Hu): The Hutton soil form within the mine infrastructure area consisted of an orthic A horizon on a red apedal B horizon overlying unspecified material. The red apedal B1horizon has more or less uniform "red" soil colours in both the moist and dry states and has weak structure or is structureless in the moist state. This horizon develops in well-drained, oxidizing environments that produce coatings of iron oxides (hematite) on the soil particles, causing the red colours of the horizon.

The red apedal horizon is per definition non-calcareous within 1500mm of the soil surface, but may contain small lime nodules. The range of red colours that is a key identification tool in differentiating between a red apedal and yellow-brown apedal is defined by the Soil Classification Working Group Book, 1991. Some of the defining red soil colours identified on the sites are bleached (10R 6/4 and 10R6/6), while some are bright red (2.5YR 4/8).

Textures are coarse to medium sand to sandy-loam in the topsoil and medium to fine sandyloam in the subsoil. Structure is weak blocky (dominant) or apedal in all horizons.

The high quality orthic A and red apedal B-horizons make it a suitable soil form for annual crop production (good rooting medium).

Avalon Av: The Avalon soil depth utilizable for agricultural soil (to top of mottled horizon) varied from 400 mm to 1 000 mm. The deeper rooting depths (>600mm) are highly adaptable for crop cultivation as is the current scenario on ground. In general, these soils are high in transported clay in the lower “B” horizon with highly leached topsoil’s and pale denuded horizons at shallow depths. The nutrient status is generally moderate to low.

Where present, these soils will be more difficult to work due to the wetness factor, both during the mining operation, as well as upon rehabilitation. Compaction is a problem to contend with if these soils are to be worked during the wet months of the year. Stockpiling of these soils should be done separately from the dry soils, and greater care is needed with the management of erosion problems during storage. Any strong structure that develops during the stockpiling stage will need to be dealt with prior to the use of this material for rehabilitation.

Bainsvlei (Bv): Chemically, these soils (characteristics are similar within these same forms) are moderately well leached returning significantly lower amounts of Ca and Mg than the dryer soils, as well as depleted amounts of Na, K and P. The leaching of the nutrients from these soils is significant and the pale colors are evidence of the movement of water within the profile. By definition, these soils vary in the degrees of

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wetness at the base of their profile. i.e. the soils are influenced by a rising and falling water table, hence the mottling within the lower portion of the profile and the pale background colors.

Depths of utilizable agricultural soil (to top of mottled horizon) vary from 400 mm to over 700 mm. The deeper rooting depths (>700 mm) are considered potentially utilizable soils, with those less than 500 mm being considered to have a wetland or wilderness/conservation

status. In general, these soils are high in transported clay in the lower "B" horizon with highly leached topsoil's and pale denuded horizons at shallow depths. The nutrient status is variable, but due to excessive leaching is generally low.

10.7.1 Soil Chemistry

Percentage clay %

The average clay content, for the Hutton and Avalon soil was 31.6%, whilst for the Bainsvlei was 18%.

Organic matter %

The organic matter content of the soils is at best described as medium - low, with values ranging from 1.44% – 4.61 %. "Normal" productive soils have an organic matter content of above 2 %.

The cultivated soils had an organic matter averaging 3.5%. Organic matter build up on the cultivated soils is attributed to the tillage methods practiced where maize stalks are ploughed back into the soil.

Low organic readings of 1.44% were seen in samples taken at grazing camps. The low concentrations of organic matter can be attributed to the relatively low biomass present naturally, with biomass being limited by low rainfall. As biomass is relatively low, the contribution of senescing vegetation to organic matter is limited. The implication of the low organic content of the soils is that while stockpiled, it is likely that there will be a depletion of organic matter as microbial activity utilises the organic matter with little replacement from the vegetation which covers the stockpiles. This is due to the fact that the surface area of the stockpiles is low relative to the volume.

pH

pH measurement is a valuable indicator of the availability of plant nutrients and the presence of particular ions in the soil solution. The soil pH is in the order of 4.82 – 5.91 with an average pH value of 5.60 indicating acidic soil conditions.

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The low pH also indicates that calcium is abundant in the soil solution, with low sodium ion in solution. Values of pH 5.0 to 5.5 could also indicate soluble, toxic levels of Al3+ and Mn2+.

Acidic soils create production problems by limiting the availability of some essential plant nutrients and increasing the soil solution's toxic elements, such as aluminium and manganese, the major cause of poor crop performance and failure in acidic soils.

CEC

The potential of a soil to retain and supply nutrients can be assessed by measuring the Cation Exchange Capacity (CEC). The average CEC within soils mapped was 12.12 cmol/kg. This is relatively low. Low CEC values are an indication of soils lacking organic matter and clay minerals. Soils with high organic matter content will have a CEC of 300 cmol/kg and soils with low organic matter and clay content will have a CEC of 1-5 cmol/kg.

Soil erodibility

The clay content discussed above (5.1.1) and the soil erodibility nomograph of Wischmeier, Johnson and Cross (1971) were used to calculate the minimum erosion slope of the identified soils. The broad-based erodibility of the different forms, taking into account the organic matter and soil texture is tabulated in Table 7. The erodibility of the dominant soil forms i.e. Hutton and Clovelly is classified as a moderate to high erodibility index. This is due to low clay content in the “A” horizons of the soils and the low organic carbon content. However the flat topography of the area will effectively reduce the erosion potential to low. See table 12 below.

Table 13: Soil Erodibility Index Rates

Soil Form	Erodibility Index
Hutton	Low
Avalon	Low
Bainsvlei	Low

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10.7.2 Local Soil Type

From a soil specialist study that was conducted, a map in Figure 23 was produced. This map shows that the mining right area is covered with Red or yellow structureless soils with a plinthic horizon.

Red apedal soils

These soils have a structure that is weaker than moderate blocky or prismatic in the moist state, if structure is borderline, CEC (NH4OAc, pH7) per kg soil is less than 11cmol (+)/kg soil. These soils are non-calcareous in any part of the horizon which occurs within 1500mm of the soil surface but may contain infrequent, discrete, relict lime nodules in a non-calcareous soil matrix. It does not have alluvial or aeolian stratifications.

The B horizons that have more or less uniform colours, falling within the range defined as red and that in the moist state, lack well-formed peds other than porous micro-aggregates, qualify as red apedal. The concept of these macroscopically weakly structured or structureless materials embraces that kind of weathering that takes place in a well-drained oxidizing environment environment to produce coatings of iron oxides on individual soil particles (hence the diagnostic red colours) and clay minerals dominated by non-swelling 1:1 type.

Yellow apedal soil

This horizon does not have grey colours in the dry state as defined for the E horizon. Although colour must be substantially uniform, some variability is permitted, for example mottles or concretions which are insufficient to qualify the horizon as a diagnostic plinthic B, faunal reworking may also result in acceptable colour variegations. It is non-calcareous within any part of the horizon which occurs within 1500mm of the surface but may contain infrequent, discrete, relict lime nodules in a non-calcareous soil matrix. Does not have alluvial or aeolian stratifications, directly underlies a diagnostic topsoil horizon or an E horizon.

Yellow-brown apedal B horizons occur over approximately the same climatic spread as their red counterparts and so are also very widely distributed throughout the country. They may be found on all types of parent material.

Plinthic horizon

- ✓ Hard plinthic B Horizon

Consists of an indurated zone of accumulation of iron and manganese oxides which cannot be cut with a spade, even when wet. Occurs beneath an Orthic A horizon, an E horizon or a yellow-brown apedal B.

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✓ Soft plinthic B-horizon

Has grey colors caused by gleying. This horizon has in the non-concretionary parts of the horizon, a loose, friable or slightly firm consistence. This horizon is non-indurated and can be cut with a spade when wet, even though individual mottles may have hardened irreversibly to form concretions.

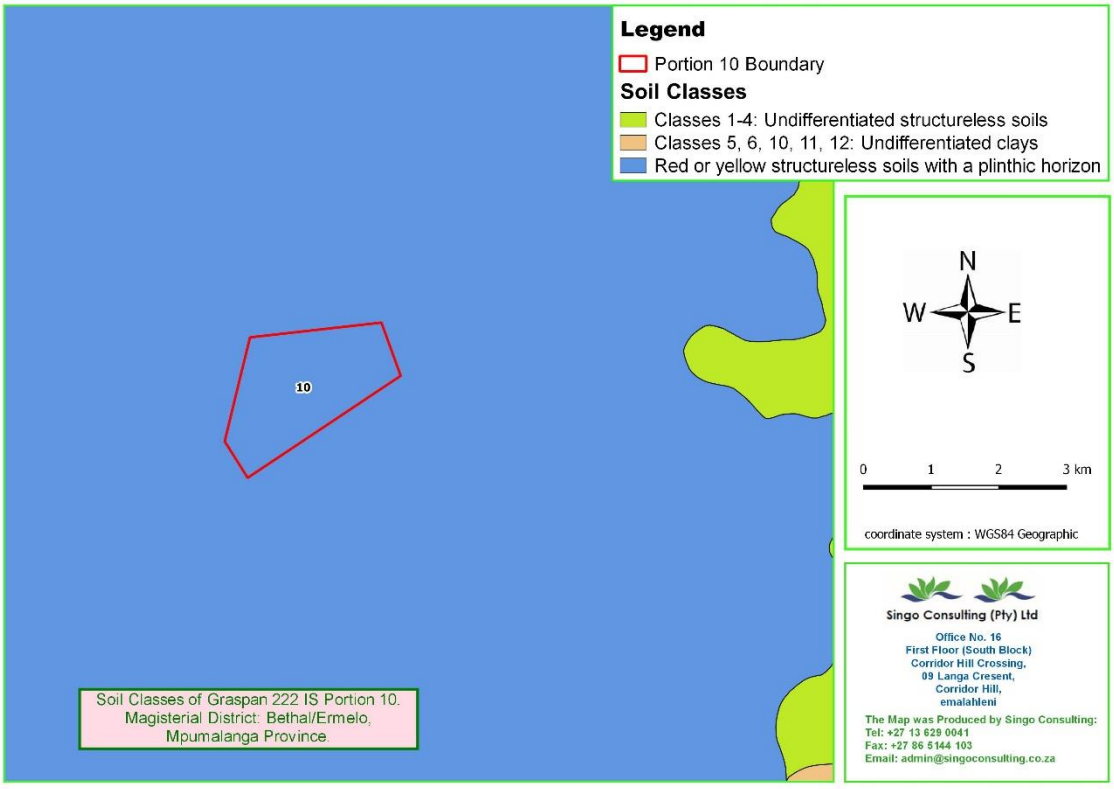

Figure 32: Soil Classes

10.7.3 Field soil identification: Soil sampling

Soil sampling took place on the 08th July 2019, at the Increadable Berachot Mining & Traders (Pty) Ltd mining right site. The main aim was to identify the soil moisture, colour, consistency, structure, soil type and origin (MSSCCO) of the soil. The soil form and family was also identified. The table 13 below shows the MSSCCO of this area. Five (5) samples were collected.

Table 14: MSSCCO table

MSSCCO	Soil 1	Soil 2	Soil 3	Soil 4	Soil 5
Moisture	Moist	Moist	Slightly moist	Slightly moist	Slightly moist
Colour	Greyish - brownish	Yellowish grey	Blackish grey	Grey	orange-grey
Consistency	soft	soft	Loose	Loose	soft
Structure	Intact	Intact	Micro-shattered	shattered	shattered
Soil type	Silty-clay loam	Silty-clay	silty	silty	silty
Origin	Colluvium	Colluvium	Alluvium	Colluvium	Colluvium

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The pictures below were taken during the soil survey process on 08th July 2019.

Figure 33: Soil samples collected during soil survey

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10.7.4 Pre-mining land capability

The pre-mining land capability within the proposed Graspan Mine infrastructure area was classified according to DAFF guidelines.

The northern section falls within Land Capability Class II. Agricultural potential is medium – high as the soils are nearly level and deep; they hold water well and are generally well drained; they are easily worked, and fairly well supplied with plant nutrients with a high responsiveness to inputs of fertilizers.

The southern section falls within land capability class III. The agricultural potential is low – medium. The areas is utilised as a grazing camp due the protrusion of rock outcrops.

A small section within the proposed infrastructure area falls within Class IV. The area has severe erosion hazard and requires careful conservation management

The extent of land capability classes shown in the pre-mining capability map (Figure 35[B]), indicates that predominantly Class II, with limited Class III and Class IV areas, will be affected by the proposed surface activities. Table 14 shows the land capability class, a broad description, the number of units per land capability class, and the area and percentage comprised by each land capability class.

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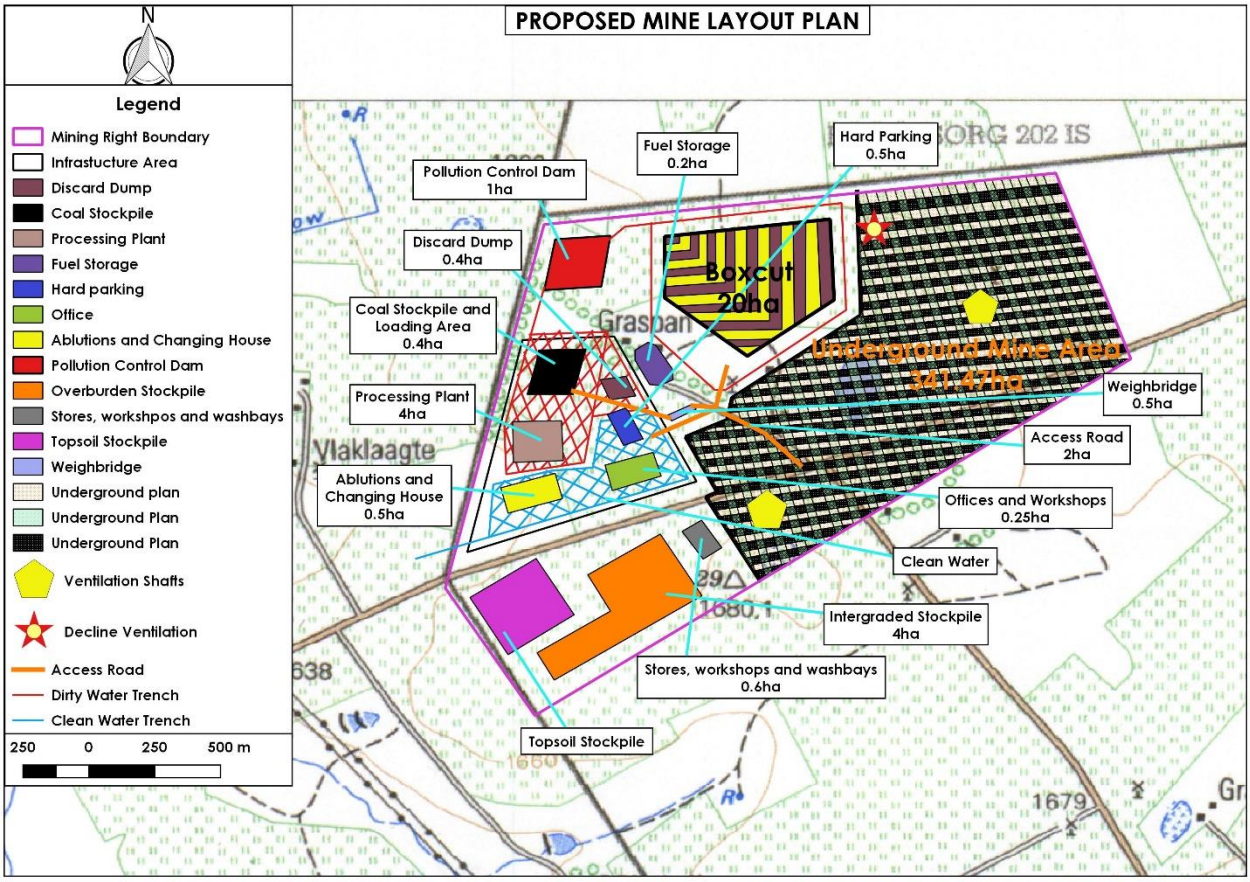

Figure 34: Proposed mine layout plan

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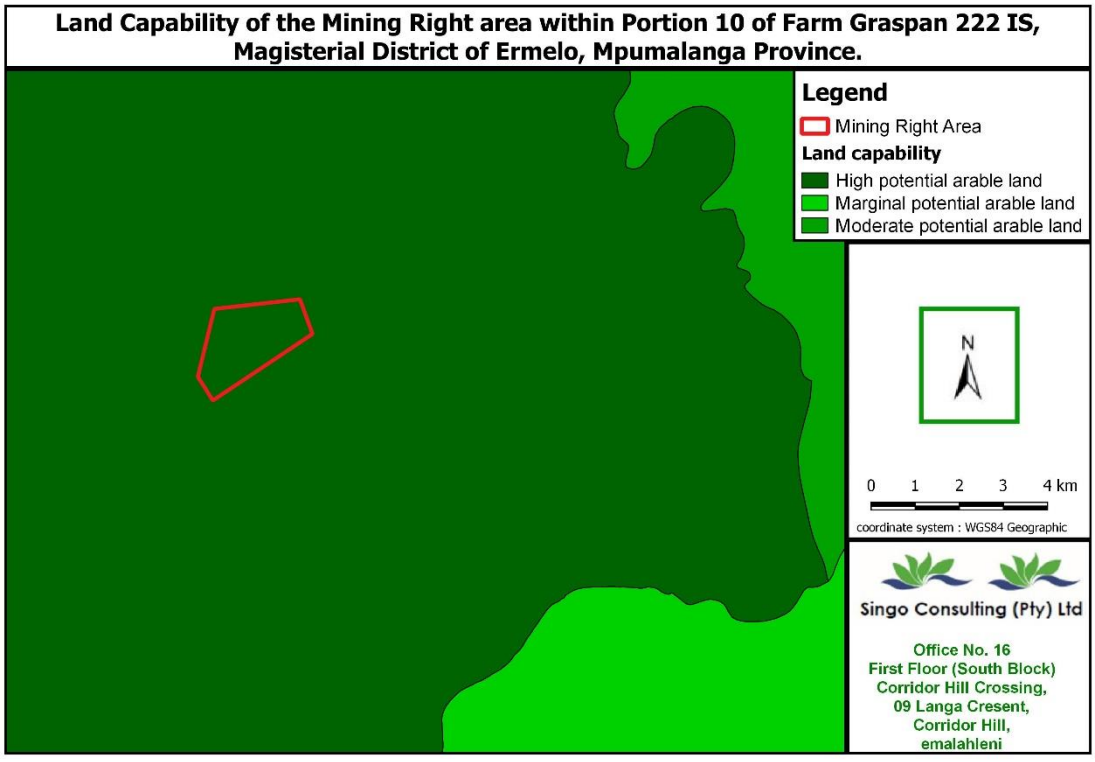

Figure 35: (A) Identified properties on site, (B) Land capability map class across the proposed Graspan Mine infrastructure area.

Table 15: Pre mining land capability classes

Land capability class	Land capability Group	Broad Soil Description	Area (ha)	Area (%)
II	Arable	Orthic topsoil A horizon overlying a deep, red, well drained, structure less, B horizon underlain by hard or weathered rock.	57.7	87.8
III	Arable	Orthic A horizon overlying a red apedal B Horizon underlain by a Soft Plinthic B horizon.	7.47	11.4
IV	Grazing	Orthic A horizon overlaying weathered rock.	0.53	0.8

10.7.5 Land use

The localities and extent of pre-mining land uses for the proposed infrastructures is shown in Figure 34. The surrounding land uses are associated with maize bankers, water bodies; Farming.

The main land use within the proposed site is maize crop farming which has led to clearing of extensive land. The remaining natural vegetation (un-cleared land) is along streams and wetlands. The site farming activities also includes livestock farming. There are two water pans within the proposed site used for provision of drinking water to the livestock (cattle and sheep). There are also three windmills within the proposed site. There are housing infrastructures located within the proposed site, these are used as dwellings.

During site inspection, a flowing 3.71km Olifants and 3km Bankfontein streams away from the site were discovered on the side of the mining right area. Land use was identified using ArcGIS software and then ground-truthed while in the field. The land use is classified clearly as:

- Cultivated land
- wetlands and water bodies
- Maize commercial area.

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- Woodlands (previously termed woodland and forests)

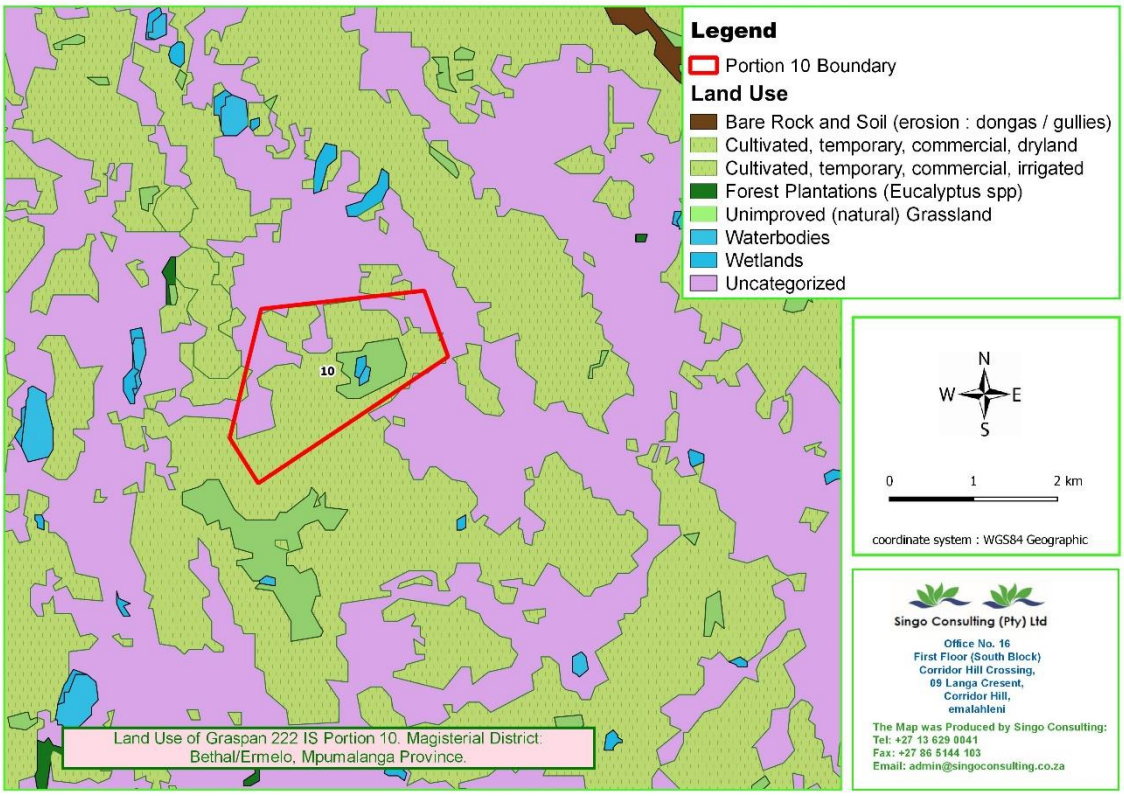

Figure 36: Land use map

The current land use of the proposed site as shown in the images also includes:

- Farm residential plot
- Wetlands present around the site.
- Cultivation
- Maize Banker Production area

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10.7.6 Vegetation

The proposed site is located within the Mesic Highveld Grassland Bioregion (See Figure 37 below) and specifically within the Eastern Highveld Grassland. This is mainly distributed in Mpumalanga and Gauteng Provinces in the plains between Belfast in the east and the eastern side of Johannesburg in the west and extending southwards to Bethal, Ermelo and west of Piet Retief. The landscape features are characterised by lightly to moderately undulating plains, including some low hills and pan depressions. The vegetation is short dense grassland dominated by the usual highveld grass composition (Aristida, Digitaria, Eragrostis, Themeda, Tristachya etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (Acacia caffra, Celtis africana, Diospyros lycioides subsp lycioides, Parinari capensis, Protea caffra, P. welwitschii and Rhus magalismontanum).

The desktop study established that there are patches of Irreplaceable Critical Biodiversity Area (CBA), moderately and heavily Modified “Other Natural Areas” and the Protected Kruger National Park the north across the Crocodile River. The CBA Irreplaceable covers less than 3% of the proposed site. During the field work a total of 16 plants were identified which includes invasive plants, the plant species on site are little varied considering the extent of ecological disturbances on site which includes crop and livestock farming.

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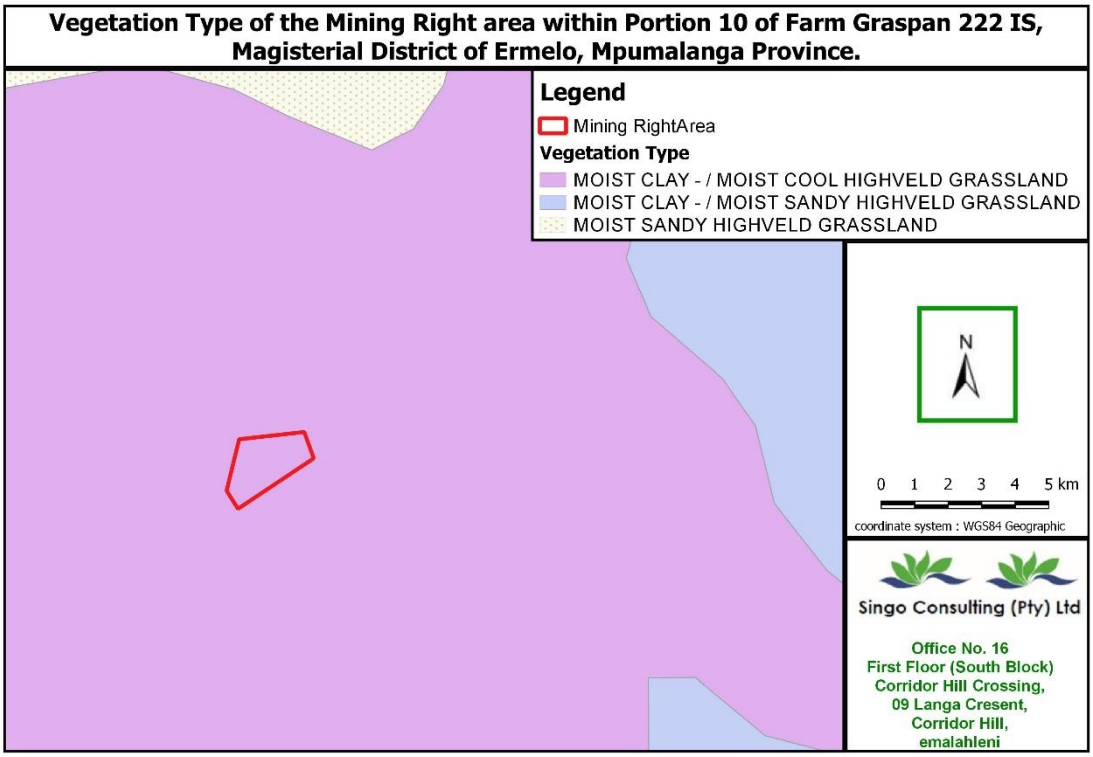

Figure 37: Vegetation type

10.8 Conservation and sensitivity status

Ecosystem threat status outlines the degree to which ecosystems are still intact or alternatively losing vital aspects of their structure, function and composition, on which their ability to provide ecosystem services ultimately depends (Driver at al., 2012). Ecosystem types are categorised as Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or Least Threatened (LT), based on the proportion of each ecosystem type that remains in good ecological condition (Driver at al., 2012).

According to Mpumalanga Terrestrial Biodiversity Spatial Plan (MBSP) 10.1, the majority of the proposed site has been transformed and have been mapped as heavily modified and Moderately modified. The undisturbed area is mapped as “other natural”. There are no Critical Biodiversity Area (CBA) and Ecological Support Areas (ESA) within the proposed site. The CBA (Optimal) is however present at 40 metres north of the proposed site and at 400 metres south west of the proposed site. An irreplaceable CBA is located along the Bankspruit River at 3 kilometres west of the proposed site, the rest of the river is mapped as ESA Local corridor.

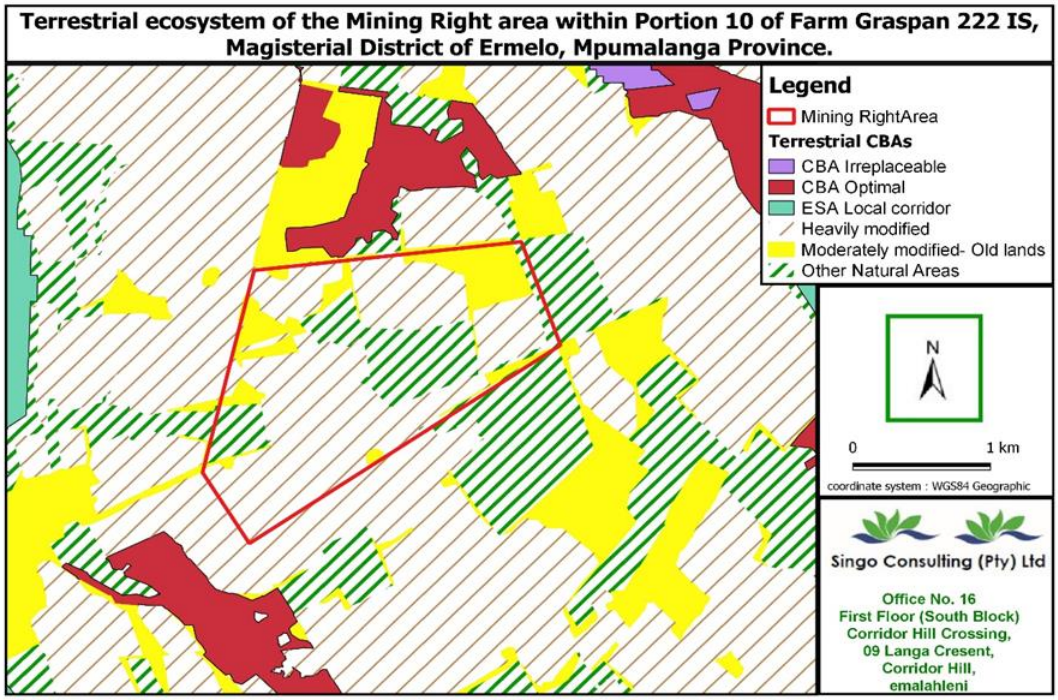

Figure 38: Sensitivity map

The New POSA Database search returned only a single tree species this is mainly because of the agricultural disturbances within the region. The search results returned the following tree:

Species Name	Status	Conservation Status	
		National Status	MTPA
Malvaceae Abelmoschus esculentus (L.) Moench var. esculentus	Naturalised	N/A	N/A
**MTPA – Mpumalanga Tourism & Parks Agency*			

10.9 Field Work

The fieldwork and sample sites were placed within targeted areas (i.e. target sites) perceived as ecologically sensitive based on the preliminary interpretation of satellite imagery and GIS analysis (which included the latest applicable biodiversity datasets) available prior to the fieldwork.

The focus of the fieldwork was therefore to maximize coverage and navigate to each target site in the field in order to perform a vegetation and ecological habitat assessment at each sample site. Emphasis was placed on sensitive habitats, especially those overlapping with proposed development areas. Due to the timing of the survey, morphological structures used to identify flora, such as inflorescences and flowers, are either limited or absent, thus affecting the floral species identified.

At each sample site notes were made regarding current impacts (e.g. livestock grazing, erosion etc.), subjective recording of dominant vegetation species and any sensitive features (e.g. wetlands, outcrops etc.) present. In addition, opportunistic observations were made while navigating through the project area. Effort was made to cover all the different habitat types within the limits of time and access.

The desktop study established that there are various activities taking place within the proposed site which includes crop and livestock farming; and residential areas. The site activities have influenced vegetation cover within the proposed site. The vegetation covers as determined from ESRI's World Image and Google Earth Pro is approximately 30% and the rest cleared for agricultural purpose. The main agricultural activities within the proposed site are the following: Livestock Farming: Sheep and Cattles; and Crop Farming (Maize). See Figure 39. During the field work a total of 16 plants were identified which includes invasive plants. Some of the identified trees are shown in the table below. A full specialist biodiversity study is enclosed as part of the EIA (Appendix 10).

		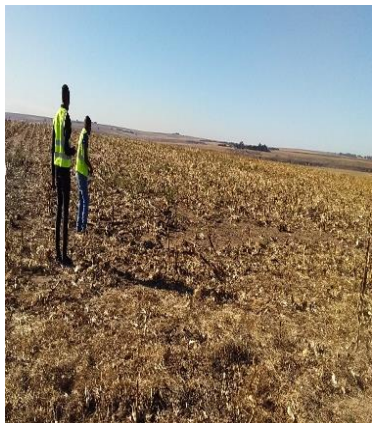
Shrub	*Shrub*	*Crop farming*

Figure 39: Identified trees and their conservation status

A total of 16 plants were identified which includes invasive plants during field work.

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Bidens pilosa	Lantana Camara
	
Malvastrum coromandelianum	Tagetes minuta
	
Helichrysum aureum	Hypochaeris radicata

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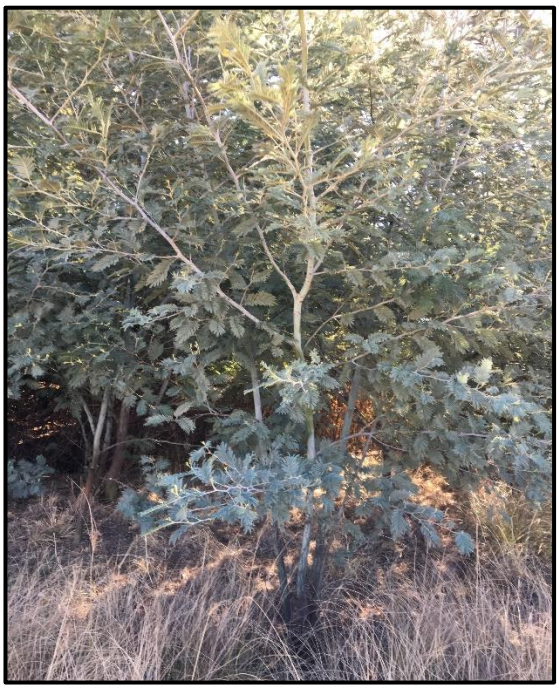
Sonchus asper

Eucalyptus sideroxylon

Acacia dealbata



Acacia mearnsii

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Amaranthus viridis	amaranthus spinosus
	
Ricinus communis	xanthium strumarium

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Solanum elaeagnifolium	Verbena bonariensis

10.10 Fauna

The field work identified the following main species: Apart from the usual livestock such as domestic animals naturally, the area supports reptiles (lizards), birds and large/small mammals. The following animals are common in the area: Water buck, scrub hare, red rock rabbit, common mole rat, grey pygmy climbing mouse, polecat, water mongoose, and yellow mongoose. See Table below.

Table 16: List of animals encountered on site

	

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10.10.1 Avifauna

According to the 2013 Important birds' area, there are no "important birds' area" within the proposed site. The MTPA database search for the proposed site returned avifauna species as listed in Table 14 below.

Table 17: MTPA Avifauna search results

Common Name	Scientific Name	Conservation Status
African Finfoot	Podica senegalensis	VU
Bateleur	Terathopius ecaudatus	EN
Secretary bird	Sagittarius serpentarius	VU
**MTPA – Mpumalanga Tourism & Parks Agency*		

10.10.2 Animals

The quarter grid search for fauna in the proposed area returned the following results:

Common Name	Scientific Name	Conservation Status	
		National	MTPA
Fish			

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HVIT	Hydrocynus vittatus	LC	LC
Invertebrates			
Olpogastra lugubris	Olpogastra lugubris	VU	VU
Amphibians			
Breviceps sopranus	Breviceps sopranus	DD	VU
Bats			
Rhinolophus cohenae	Cohen's horseshoe bat	VU	VU
Scotophilus nigrita	Schreber's yellow bat	NT	NT
Mammals			
Galerella Sanguinea	Slender Mongoose	LC	LC
Orycteropus afer	Aardvark	LC	LC
**MTPA – Mpumalanga Tourism & Parks Agency*			

The field work conducted by Mielelani Consultancy (MC) identified a total of ten faunae on site which includes a mammal, birds, reptiles and invertebrates. A list of all identified fauna is provided below with their conservation statuses. Vulnerable (VU) and Near Threatened (NT) Species were further discussed below. A total of six species were identified during the site visit.

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Table 18: species which were identified during the site visit.

 Galerella sanguinea	 Cattle egret
 Red eyed dove	 Motacilla flava
 Bufo gutturalis	 anthus cinnamomeous

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Fauna Species encountered on site	
Common name	**scientific name**
Mammals	
Slender mongoose	Galerella sanguinea
Birds	
cattle egrat	bubulcus ibis
red eyed dove	streptopelia samitorquater
sabota lark	mirafra sabota
flappet lark	mirafra rufocinnamomea
grassveld pipit	anthus cinnamomeous
yellow wagtail	motacilla flava
blackeyed bulbul	pycnonotus barbatus
spotted flycatcher	muscicapa sriata
Snakes	
common puff adder	bitisarietans

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11 HYDROLOGY

According to the geohydrology specialist report conducted. The baseline geohydrological assessment for the project area is mainly constructed by a combination of desktop study and site-specific field study. The majority of the information used for this study was compiled with the aid of nearby study sites and information and experience from similar geohydrological settings. All collected data will be compiled to construct a conceptual geohydrological model.

The objective of the study is to collect hydrogeological and geochemical baseline information to address the subsequent environmental impact assessment for the colliery. The impact assessment should be separated into pre-construction, construction, operational, decommissioning and closure and post closure phases. Management and mitigation measures for identified impacts should be outlined for each phase of the project and associated monitoring, management and mitigation measures recommended.

In order to quantify potential impacts of the various project phases on the ambient groundwater environment, a numerical groundwater flow and transport model for the project area will be developed. The development of the numerical groundwater model will be based on hydrogeological and geochemical data gathered for the site itself as well as information from the adjacent coal projects in Mpumalanga province. This report provides some preventative measures.

11.1 Wetlands

There are a few wetlands situated on site which are seasonally dry. A wetland delineation and present ecological state analysis are conducted for this project as part of the WULA. While this study focuses on the impact of mining on the wetlands, it will form part of the EIA process for authorisation. Surface mining will stay 100m away from wetlands.

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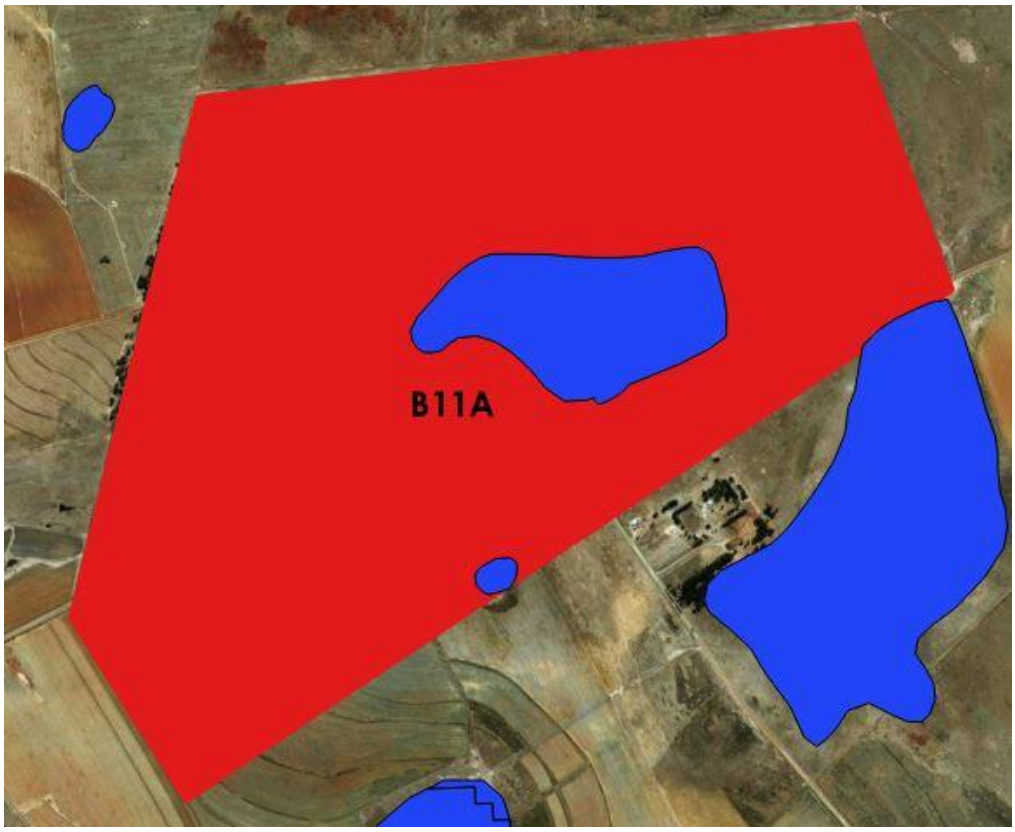

Figure 40: Wetlands in the vicinity of the area

11.2 Surface water

A surface water impact assessment and technical report have been compiled regarding all surface water included in the WULA. The purpose of water sampling is to gather some baseline information prior to the proposed operations. These studies and baseline information are a requirement for the WULA prior to mining operations. The storm and surface water management plan has been enclosed as part of the specialist studies.

11.3 River diversions

No river diversion is planned

11.4 Ground water

11.4.1 Regional geology

In general, the coal deposits in South Africa are hosted by the Karoo Supergroup, which was deposited in the Gondwana basin that covered parts of Africa, Antarctica, South America and Australia. The basal

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Stratigraphy of the Karoo Supergroup comprises the Dwyka Group which is a Late Carboniferous to Early Permian (~320Ma) sequence of glacial and periglacial sediments including diamictite, till moraine, conglomerate, sandstone, mudstone and varved shale.

This is overlain by the Ecca Group which is an Early to Late Permian (~260 Ma) sequence comprising sandstone, siltstone, mudstone and significant coal seams deposited in a terrestrial basin on a gently subsiding shelf platform. In the surrounding Witbank Coalfield areas, the Ecca Group is overlain by the Beaufort Group, which is Early Triassic (~260 to 210 Ma), comprising multi-colored mudstone and sandstone with only minor coal accumulation, and was deposited in a fluvial environment.

The Molteno Formation rests unconformably on the Beaufort Group and comprises Late Triassic (~210 Ma) coarse, immature sandstone with minor argillaceous layers derived from braided streams. This in turn is overlain by the Elliot Formation consisting of red mudstone and sandstone and the Clarens Formation comprising Aeolian sandstone. At the top of the Karoo Supergroup stratigraphy is the Drakensburg Group, which comprises Early to Middle Jurassic (~180 Ma) flood basalts.

According to the 2628 East Rand 1:250 000 geology series map the site is situated on Permian (245 000 – 290 000 million years) sandstone, shale and coal beds of the Vryheid Formation of the Ecca Group, and Karoo Supergroup. Jurassic (145 000 – 208 000 million years) dolerite sills intruded into the older sediments through vertical feeder dykes. Quaternary surficial deposits of alluvium and ferricrete can be found throughout the surrounding area.

The Ecca Group, which is part of the Karoo Supergroup, comprises of sediments deposited in shallow marine and fluvial-deltaic environments with coal accumulated as peat in swamps and marshes associated with these environments. The sandstone and coal layers are normally reasonable aquifers, while the shale trends to act as aquitards. Several layered aquifers perched on the relative impermeable shale are common in such sequences. The Dwyka Formation comprises consolidated products of glaciations (with high amounts of clay) and is normally considered have impermeable qualities.

The general horizontally disposed sediments of the Karoo Supergroup are typically undulating with a gentle regional dip to the south. The extent of the coal is largely controlled by the pre-Karoo topography.

Abundant dolerite intrusions are present in the Ecca sediments. These intrusions comprise sills, which vary from being concordant to transgressive in structure, and feeder dykes. Although these structures serve as aquitards and tend to compartmentalise the groundwater regime, the contact zones with the pre-existing geological formations also serve as groundwater conduits. There are common occurrences of minor slips or

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faults, particularly in close proximity to the dolerite intrusions. Within the coalfield, these minor slips, displacing the coal seam by a matter of 1 to 2 meters, are likely to be common in places.

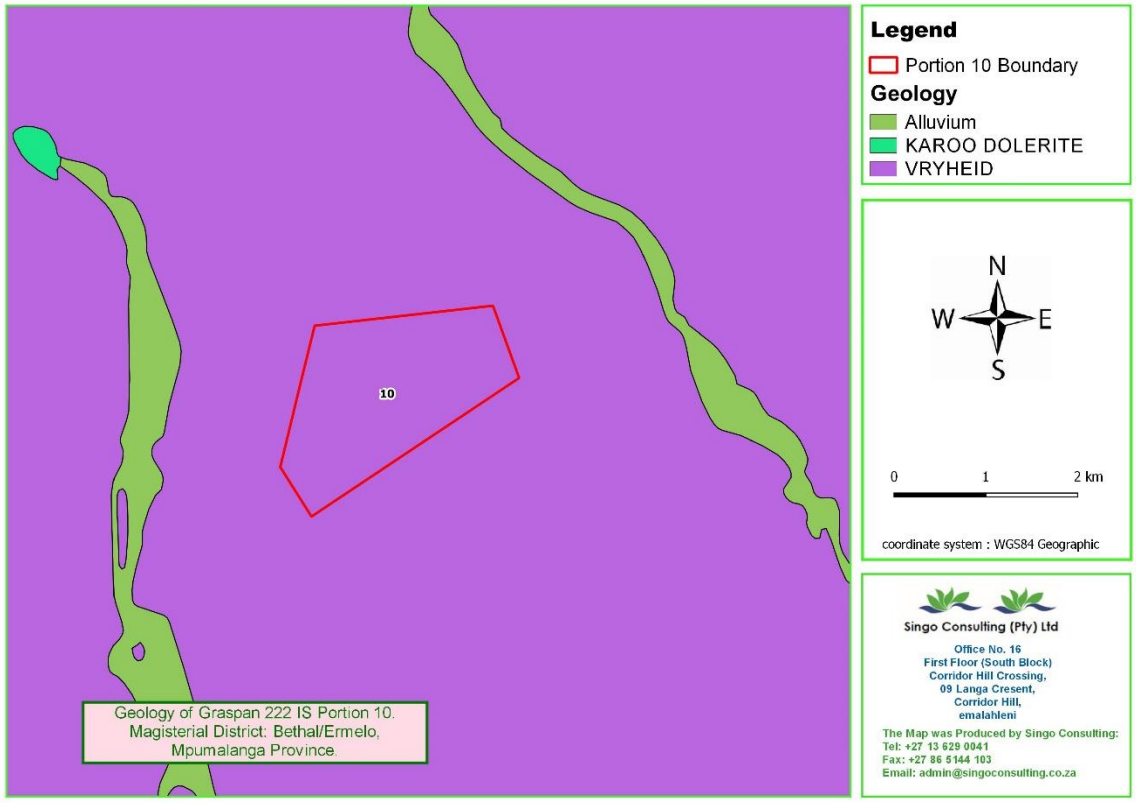

Figure 41: Geological map of the area

11.4.2 Regional hydrogeology

Five distinct aquifer types:

1. Basement (fractured Achaean-Proterozoic igneous/metamorphic)
2. Hard-rock (e.g. Table Mountain TMG, Waterberg and Natal Groups sandstone; fractured)
3. Karst/dolomite (dissolution)
4. Karoo (fractured and influenced by dykes)
5. Porous (intergranular quaternary alluvial, coastal, Aeolian and other surficial unconsolidated deposits)

The study area falls under the Karoo (fractured and influenced by dykes). For effective borehole yields, the boreholes must target the fracture zones in this area.

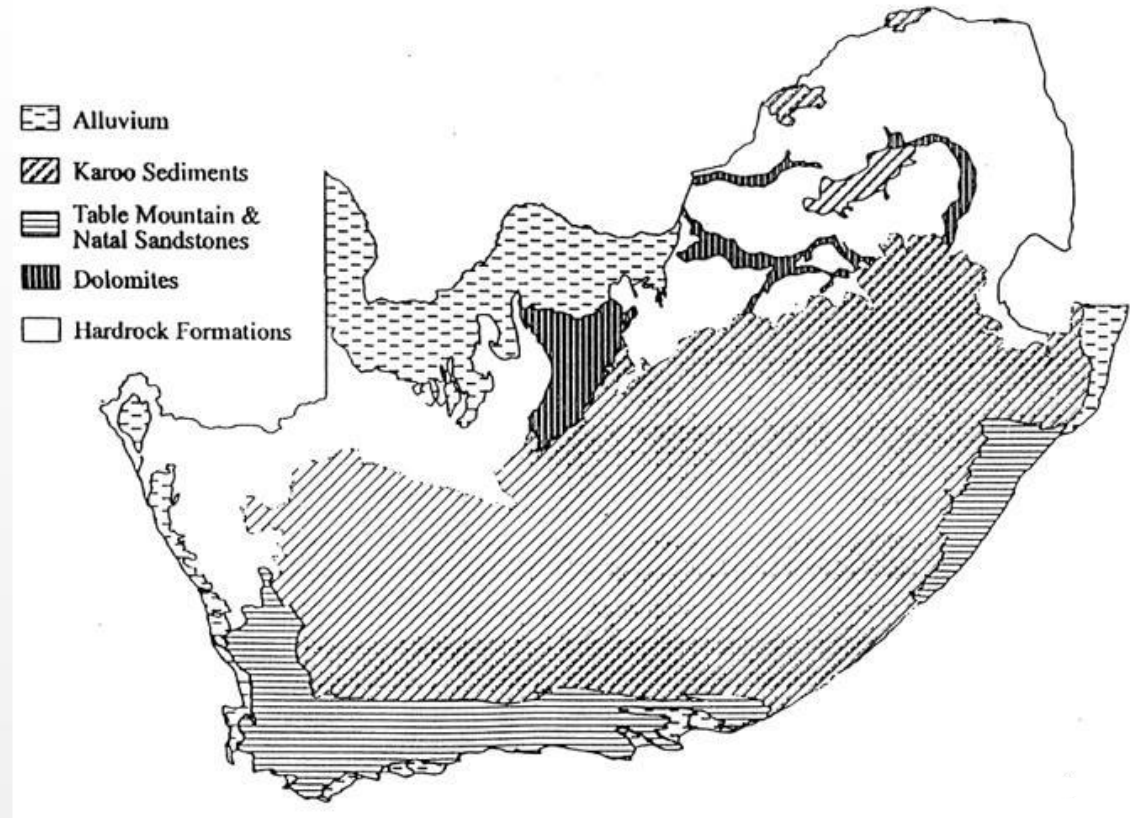

Figure 42: Aquifers of South Africa

The groundwater potential of the formations located in the project area is limited in their pristine state due to low permeability, storage and transmissivity. Secondary processes, such as weathering, fracturing, etc., are required to enhance the groundwater potential. Based on regional data, as compiled on the 1:500 000 hydrogeological map the following hydrogeological information is available for the formations on site.

11.4.2.1 Regional groundwater occurrence and aquifers

Based on the geology within the study area, the structural geology, and the geomorphology, the following conditions can arise to enhance aquifer development within the study area:

- The fractured transition zone between weathered and fresh bedrock
- Fractures along contact zones between the host rocks due to heating and cooling of rocks involved with the intrusions
- Contact zones between sedimentary rocks of different types
- Interbed or bedding plane fracturing
- Openings on discontinuities formed by fracturing
- Faulting due to tectonic forces
- Stratigraphic unconformities
- Zones of deeper weathering

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- Fractures related to tensional and decompressional stresses due to off-loading of overlying material
- Groundwater occurs within the joints, bedding planes and along dolerite contacts. Groundwater potential is generally low in these rocks, with 87% of borehole yields < 3 l/s

The fractured Karoo aquifer consists of the various lithologies of siltstone, shale, sandstone and coal seams. The pores of the geological units are generally well-cemented and the principle flow mechanism is fractured flow along secondary structures, e.g. faults, bedding plane fractures, etc. The intrusion of the fractured aquifer by dolerite dykes and sills has led to the formation of preferential flow paths along the contacts of these lithologies due to the formation of cooling joints. The dykes may act as permeable or semi-permeable features to impede flow across the dykes.

The fractured pre-Karoo aquifer is separated from the overlying fractured Karoo aquifer by Dwyka tillites which act as an aquiclude where present. The flow mechanism is fracture flow, as can be expected from the crystalline nature of the granite rocks. The water quality is generally characterised by high fluoride levels which limits exploitation of this aquifer in combination with the general low yields, deep (expensive) drilling and the low recharge (Grobbelaar, et al., 2004). Mining of the coal seams has resulted in the introduction of an artificial aquifer system which generally dominates the groundwater flow on a local and regional scale.

11.4.2.2 Shallow weathered Karoo aquifer (unconfined)

11.4.2.2.1 Overburden/weathered zone aquifer

- The weathered zone of the Karoo sediments hosts the unconfined or semi-confined shallow weathered Karoo aquifer. Water levels are often shallow (a few meters below ground level) and the water quality good due to direct rainfall recharge and dynamic groundwater flow through the unconfined aquifer in weathered sediments, which makes it also vulnerable to pollution.
- Water intersections in the weathered aquifer are mostly encountered above or at the interface to fresh, where the vertical infiltration of water is typically limited by impermeable layers of weathering products and capillary forces, with subsequent lateral movement following topographical gradients.
- Localised perched aquifers may occur on clay layers or lenses at shallower depth (soil zone), but due to their localised and detached nature, they are of no further interest to the current study.
- Alluvial deposits occur in most valley bottoms associated with surface water courses, but their regional coverage is small. These unconsolidated alluvial sediments comprise of clay, sand, gravel and boulder sized grains.

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11.4.2.3 Fractured aquifer

11.4.2.3.1 Upper fractured aquifer (unconfined to semi-confined) (less than 70 to 90mbgl)

- The weathered aquifer is underlain by a deeper semi-confined to confined fractured aquifer in which fracture flow dominates. The fractured Karoo aquifer consists of the various lithologies of siltstone, shale, sandstone and the coal seams, where groundwater flow is governed by secondary porosities like faults, fractures, joints, bedding planes or other geological contacts, while the rock matrix itself is considered impermeable.
- Geological structures are generally better developed in competent rocks like sandstone, which subsequently show better water yields than the less competent silt or mudstones. Not all secondary structures are water bearing due to e.g. compressional forces from the neo-tectonic stress field overburden closing the apertures.
- Although the Karoo aquifer supports domestic and stock water requirements in the area, their physical and hydraulic characteristics preclude large-scale groundwater exploitation, e.g. irrigation.
- The strike frequency analysis for the Karoo rocks indicates a predominantly shallow groundwater occurrence, mostly in the first 50m below the water table (Woodford and Chevallier, 2002).

11.4.3 Local hydrogeology

Three distinct superimposed groundwater systems are present. These are the upper weathered Ecca aquifer, the fractured aquifers within the unweathered Ecca sediments and the aquifer below the Ecca sediments. The following aquifer description extracted from the previously stated references is relevant to the project area.

11.4.4 Groundwater levels

- The depth to groundwater level, i.e. the top of the saturated zone, generally lies between 5 and 40m below surface. The mode is 10-15m.
- The probability of striking water is highest in the first 10-15m or so below the groundwater level.
- Peak strike depths range from 15-50m below the surface. Below 50m strike frequency averages about one third of that between 10 and 40m.
- The chances of striking water are neither enhanced nor on the other hand appreciably reduced by the presence of dykes.
- Dykes should not be considered hydrogeologically different from the gneisses, granites and granitoids in which they occur, but as part and parcel of a hard-rock entirety. Their water-bearing characteristics should be seen neither as barrier nor as conduit, but as variable as the adjoining country rock.
- Dyke contacts are not necessarily water strike zones. Success depends on whether country rock or dyke or both are weathered and fractured to below the water level.

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- Deeper strikes do not necessarily result in higher yields. There is no material difference between shallow-strike and deep-strike median yields. The effect of greater pumping drawdown is apparently counteracted by a decrease of fracture aperture and 5.5 Groundwater potential contaminants.

11.5 Hydrocensus

The primary objective of the hydrocensus is to identify the baseline groundwater use and users within the study area. The hydrocensus took place at the mining right farm. The project site falls within B11A quaternary catchment area. Groundwater in the investigation area is mainly used for domestic and stock watering purposes, with no irrigation use visible.

On the 08th July 2019, a hydrocensus was conducted on the Colliery, as one of the methods to collect the data on the site. Various tools were used in collecting the data such as TLC, hand GPS, measuring tape and a bailer. These tools were used on various boreholes on the site. The hand GPS was used to determine the longitudinal, latitude and elevation for each borehole that was being observed. After recording the GPS coordinates, the measuring tape was used in taking all collar height measurements of the boreholes. The level meter together with a measuring tape in order to get the water levels.

11.6 Drilling and citing of boreholes

Hydrogeologists from Singo Consulting (Pty) Ltd visited the mining right farm for sampling of the drilled exploration boreholes located in and surrounding farms of the study area. On the 08th of July 2019, a hydrocensus was conducted on the Colliery, as one of the methods to collect the data on the site. Various tools were used in collecting the data such as TLC, hand GPS, measuring tape and a bailer. These tools were used on various boreholes on the site. The hand GPS was used to determine the longitudinal, latitude and elevation for each borehole that was being observed. After recording the GPS coordinates, the measuring tape was used in taking all collar height measurements of the boreholes. The level meter together with a measuring tape in order to get the drawdown water levels and the recovery water levels. The boreholes name acronyms interpretation:

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Table 19: Hydrocensus boreholes recorded from the project site

Sample ID	**Y**	**X**	**Borehole Diameter(mm)**	**Static water level(mbsl)**	**Condition of borehole/ Pan**	**Comments**
Bankspruit stream	-26.16'34,5''	29.37'31,4''	-	-	Running water	Greenish, odourless water.
BH01	-26.15'36.3''	29.38'58.2''	Not known	-	Not bad	Drinking water, clear, odourless

A detailed hydrogeology study is enclosed as part of the specialist studies on Appendix 14.

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12 AIR QUALITY

For the purpose of the baseline investigation, desktop study was done as per the area of interest and also the regional air quality in large. Measuring of gravimetric dust fallout in mg/m^2/day and particulate matter PM 10 in mg/m^3 converted to ug/m^3 in line with the standard was ensured. Comparison of different guidelines and standards was also ensured. The relevant similar referencing sites in the vicinity of the proposed project area were identified to determine previously experienced impacts. Passive and active sampling techniques were used for the baseline determination. Kindly note that no smelters and burning will be done on the vicinity of the mining right, thus an impact air quality assessment was not conducted on site, however desktop studies were done in general.

12.1 Passive sampling

According to previous studies, a site layout for the sampling points was carried out in neighbouring portions & according to the eight main compass directions, and the site layout and equipment placement was done in accordance with the ASTM standard, where after relevant sampling reference numbers were allocated to the receptors. At each gravimetric dust fallout gauge/receptor point, there was a stand built according to specifications and that contained the dust sample collection bucket. The apparatus required included open top buckets/containers of no less than 150mm in diameter with a height of no less than twice its diameter. The buckets were placed on a stand at a height of (2+/-0.2) m above the ground. Samples were collected after a one-month period (about thirty days) of running exposure. After sample collection, the samples were taken to a SANAS-accredited laboratory as required. After buckets were sent away, they were replaced with empty buckets. A visual site investigation was conducted, correlations drawn and findings identified and reported on.

12.2 Active sampling

No dust monitor was implemented, but a DUSTTRAK II Dust Monitor will be used once mining commences.

12.3 Discussion

Sensitive receptors have been identified in the immediate vicinity of the study area and proposed project area. The following may be affected by dust if not properly mitigated:

- farm homesteads
- Agricultural cultivated around the area
- Surface water bodies

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The following sources were identified as potential pollutants:

12.3.1 Vehicle exhaust gases

Vehicle exhaust gasses contain pollutants like carbon dioxide (CO_2), carbon monoxide (CO), hydrocarbons, oxides of nitrogen (NOx), sulphur and PM10. Tiny amounts of poisonous trace elements like lead, cadmium and nickel were also present. The quantity of each pollutant emitted depends on the type and quantity of fuel used, engine size, speed of the vehicle and abatement equipment fitted. Once emitted, the pollutants are diluted and dispersed in the ambient air. Pollutant concentrations in the air can be measured or modelled and then compared with ambient air quality criteria.

12.3.2 Veld fires

Veld fires are widespread across the world, occurring in autumn, winter and early spring. In addition to controlled burning for fire breaks and veld management, many fires are set deliberately for mischievous reasons. Some are accidental, like those started by motorists throwing cigarettes out of car windows. Emissions from veld fires are similar to those generated by coal and wood combustion. Whilst veld fire smoke primarily impacts visibility and landscape aesthetics, it also contributes to the degradation of regional scale air quality. Dry combustible material is consumed first when a fire starts. Surrounding live, green material is dried by the large amount of heat that is released when there are veld fires, and sometimes this material also burns. The major pollutants from veld fires are particulate matter, carbon monoxide, and volatile organics. Nitrogen oxides are emitted at rates from 1 to 4 g/kg burned, depending on combustion temperatures. Emissions of sulphur oxides are negligible (USEPA, 1996).

12.3.3 Agricultural activities

The activities responsible for the release of particulates and gasses into atmosphere do, however, include:

- Particulate emissions generated due to wind erosion from exposed areas
- Particulate emissions generated due to the mechanical action of equipment used for tilling and harvesting operations

12.3.4 Mining activities in the project area

Mining operations like drilling, blasting, hauling, collecting, and transporting are the major sources of emissions and air pollution. The use of explosives releases carbon monoxide (CO). Dust and coal particles

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stirred up during the mining process, as well as soot released during aggregate transport, contributes to emissions and respiratory problems.

12.3.5 Trucks passing on the gravel road, loading and offloading raw materials

Dust emissions occur when soil is crushed by a vehicle, due to its low moisture level. Vehicles used on the roads will generate PM-10 emissions throughout the area and carry soils onto the paved roads, thereby increasing entrainment PM-10 emissions. The quantity of dust emissions from unpaved roads varies linearly with the volume of traffic.

12.3.6 Wind erosion as a result of RoM material and topsoil stockpiles

The topsoil and waste rock stockpiles generated during construction will be minimal and probably used for construction purposes on site (berm and foundations for buildings), since it is limited to the mining area.

12.3.7 Material handling (loading, hauling and tipping)

Material handling during loading, hauling and tipping as mining processes has been known to have influence on dust generation in terms of increasing the fugitive dust emissions being generated. With the different kind of materials – topsoil, soft, and hard, tipping will be negligible. The tipping is mostly associated with the ROM at the processing plant vicinity. During these activities factors such as the surrounding wind regime, the material tipping rate, and the moisture content of the material all have an influence on the dust generation at the tipping transfer points.

12.3.8 Plant crushing and screening

There are two basic methods of crushing: compressive (jaw crushers, single and double toggles, gyratory crushers, cone crushers, roll crushers, ball mills and rod mills) or impact (rotary or vertical shaft impactors (e.g. Barmac), hammer mills (fixed or swing hammers)). Compressive crushing produces dust but does not in itself produce a great deal of air movement. The material passing through the crusher results in the dust from the process and the processed material to become airborne. Excessive clearance under the crusher can cause a lot of dust generation in the same way as a high discharge point. Impact-type crushers, like hammer mills, act as powerful fans and not only produce dust from the impact of hammer on rock, but also blow the dust out.

Screening (particularly dry screening) is the most difficult dust control problem in mining operations. Very careful planning of screen layout has to be undertaken to take out the fine cut as early as possible to lessen

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the dust carried through the screening process, and allow for the use of water to clean chip and allay dust. In most cases, the crushing and screening process represents a significant source of fugitive dust with high quantities of respirable fractions released into the atmosphere. Dust sources around the plant, excluding crushing and screening, include discharge into hoppers, long open chutes, and from conveyors and transfer points. High discharge heights produce an air pressure blast effect and create turbulence, which carries dust into the air. This causes particle fracture, and free fall allows the wind to pick up and carry the dust for a long distance from the discharge point.

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13 NOISE

A noise impact assessment must be completed if:

- An industry is to be situated within 1,000m of a noise-sensitive development (SANS 10328:2008);
- It is generally required by the local or district authorities as part of the environmental authorisation or planning approval in terms of Regulation 2(d) of GN R154 of 1992.

Appendix 6 of GN R 982 of 2014 issued in terms of the NEMA, defines minimum information requirements for specialist reports. In South Africa, the document that addresses environmental noise is SANS 10103:2008. It has recently been revised and aligned with the guidelines of the World Health Organisation (WHO). It provides the maximum average ambient noise levels during the day and night to which different types of developments indoors may be exposed. In addition, SANS 10328:2008 (Edition 3) specifies the methodology to assess the potential noise impacts on the environment due to a proposed activity that might impact the environment. This standard also stipulates the minimum requirements to be investigated for scoping purposes and a detailed specialist report.

These minimum requirements are:

1. The purpose of the investigation
2. A brief description of the planned development or the changes that are being considered
3. A brief description of the existing environment
4. The identification of the noise sources that may affect the particular development, together with their respective estimated sound pressure levels or sound power levels (or both)
5. The identified noise sources that were not taken into account and the reasons why they were not investigated
6. The identified noise-sensitive developments and the estimated impact on them
7. Any assumptions made with regard to the estimated values used
8. An explanation, either by a brief description or by reference, of the methods that were used to estimate the existing and predicted rating levels
9. The location of the measurement or calculation points, i.e. a description, sketch or map
10. Estimation of the environmental noise impact
11. Alternatives that were considered and the results of those that were investigated
12. A list of all the interested or affected parties that offered any comments with respect to the environmental noise impact investigation
13. A detailed summary of all the comments received from interested or affected parties as well as the procedures and discussions followed to deal with them

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14. Conclusions reached and recommendations made, i.e. if there could be a significant impact, or if more information is needed, a recommendation that an environmental noise impact assessment be conducted
15. If remedial measures will provide an acceptable solution, which would prevent a significant impact, these remedial measures should be outlined in detail and included in the final authorisation, if the approval is obtained from the relevant authority.

The SANS 10328:2008 and Noise Control Regulations defines a noise-sensitive development to include any of the following:

- residential districts
- non-residential districts
- educational, residential, office and health care buildings and their surroundings
- churches and their surroundings
- auditoriums and concert halls and their surroundings
- recreational areas

The receptors which were identified on site as shown on Figure 43 include:

- Farm homesteads

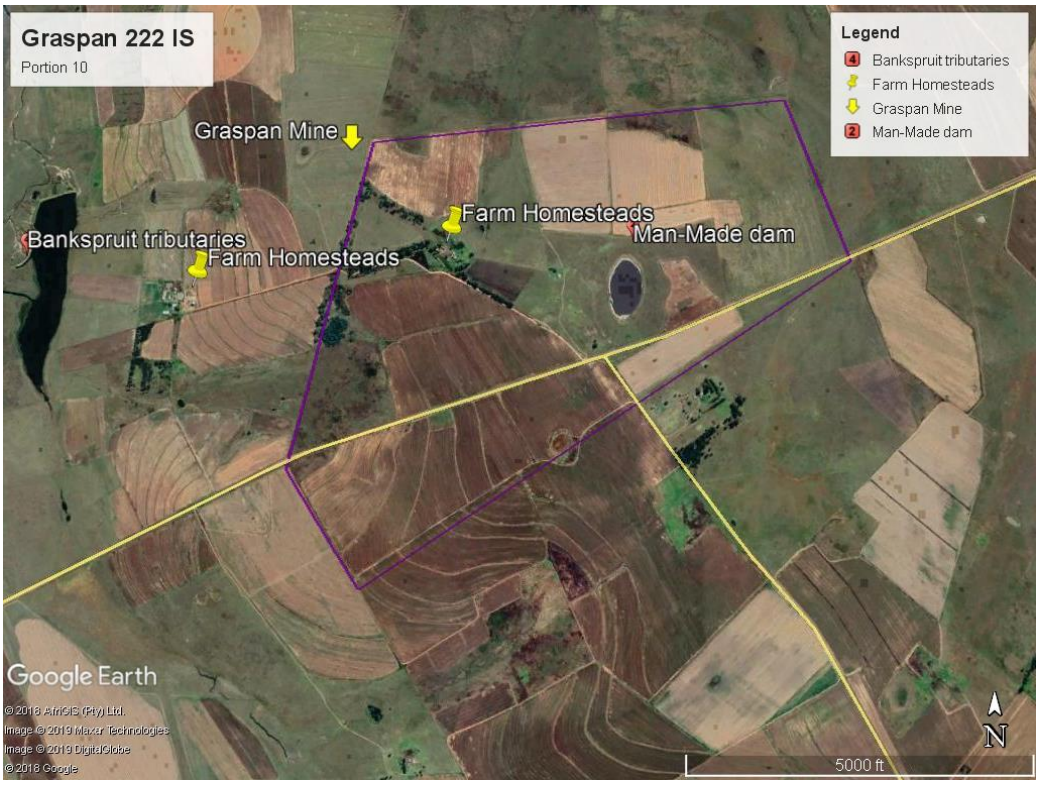

Figure 43: Study area and receptors

The nearest noise sensitive areas to the proposed development are farmsteads.

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The noise level on a typical city street with automobile traffic averages 60-65db, with larger vehicles like heavy trucks and diesel buses causing noise of up to 90db. Noise is already created by the R38 road and the gravel route that runs next to the project area which is used by trucks that transport crops. Since noise is invisible, its impact on the surrounding environment is often difficult to determine. Where possible, noise reduction equipment will be fitted onto machinery. All equipment (especially diesel-powered) will undergo regular maintenance, and a programme will be implemented to check for defective or deteriorating vehicle noise emissions.

13.1 EIA investigation of existing and future noise levels

The operations of certain industrial operations may occur over a 24-hour cycle (day and night). The most important time of investigation will be during the night (defined by SANS10103:2008 as 22:00-06:00).Five scenarios will be investigated, including planning, construction, operation, closure and decommissioning and post-closure phases.

This will allow for comprehensive Engineering for Next Internetworking Applications (ENIA) during any project phase. The most relevant phase is the operational phase, as the noise capacity generated during this phase can be long-term. This document briefly discusses the vibrations and blasting together with noises that will impact fauna. The most relevant noise to consider is the surface infrastructure, as underground works will not generate noise at receptors. It should be noted that certain important underground works do extend to the surface, the most important of which are the shaft and mine portals.

13.2 Phases investigated

13.2.1 Design phase

There will be no noise generating activities during this phase. During this phase certain mitigation measures can, however, be implemented, including design elements or management decisions which will eliminate or reduce noise generation activities.

13.2.2 Construction phase

Construction-related scenarios entail the implementation of infrastructure (subsoil, concrete and steel works, etc.) and haul routes; only daytime scenarios were considered. Most construction work will be conducted during daytime. At times, however, construction may be conducted during the night due to:

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- Concrete works that must be done in one pour (e.g. concrete slabs)
- Working overtime due to schedule constraints caused by bad weather, etc.

13.2.2.1 Wash plant

The most relevant noisy activities are:

- Sub-soil works (compaction of soils, trenching, etc.)
- Concrete pouring and vibration (an on-site batching plant was not considered)
- Cranages moving large components and materials

A "general" noise scenario will be investigated at infrastructure areas (general referring to an accumulation of power tools, trucks, etc. used by the construction crew).

13.2.2.2 Delivery/access routes

Construction or upgrading or existing roads may include the following noise-generating activities:

- Delivery of different road paving aggregates and stockpiling them on site
- Soil excavation, removal of soil for foundations (with a grader, if required)
- Soil compaction with a vibrator roller
- Roads may be paved with a road paver and asphalt truck working in conjunction

13.2.2.3 Blasting

According to the blasting assessment specialist study. A review of the project and the surrounding areas was done before any specific analysis is undertaken and sensitivity mapping was done, based on typical areas and distance from the proposed mining area. This sensitivity map uses distances normally associated where possible influences may occur and where influence is expected to be very low or none. Two different areas were identified in this regard:

- A highly sensitive area of 500m around the mining area. Normally, this 500m area is considered an area that should be cleared of all people and animals prior to blasting. Levels of ground vibration and air blast are also expected to be higher closer to the pit area;

- An area 500m to 1500m around the pit area can be considered as being a medium sensitive area. In this area, the possibility of impact is still expected, but it is lower. The expected level of influence may be low, but there may still be reason for concern, as levels could be low enough not to cause structural damage but still upset people; and

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- An area greater than 1500m is considered low sensitivity area. In this area, it is relatively certain that influences will be low with low possibility of damages and limited possibility to upset people.

Site visit and Desktop studies revealed that within the project area there are different features and activities going on. There`s a farmhouse within the project area, cultivated land, domestic animals, constructed dam, powerlines and a gravel road near the project area. These findings are addressed in relation to Blasting Impacts. Blasting activities will result to: Permanent alteration of geology, Possible contamination from hydrocarbons, Harm to possible surrounding fauna, Poor visibility, Dust creation, Air blast disturbances and Fly rock creation, Water contaminated, Groundwater contamination from contaminated water seepage, Noise and Fire hazards due to drilling. The Drilling activities will be mitigated in the following manner;

- Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow.
- Ensure that machinery used is up to standard and no leakages exists
- Hydrocarbon spillages must be cleaned immediately Contain any spillages by removing the affected soil surface and dispose at the designated waste bin to be disposes at a designated landfill site by service provider.
- Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow Fauna of the surrounding area has already being affected by mining and agricultural activities within the property.
- Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow. Stakeholders will be notified of all blasting schedules if blasting is employed
- Site Environmental Control Officer and Mine Personnel will be informed and notified before any blasting operation
- The should be reduced charge mass per delay and different initiation system must be tight to the drilling and charging mechanisms
- Stemming control will be in place to avoid air blast and fly rock
- Drilling and blasting where a pond of water exist from possible rain water will be avoided. If found, such water will be diverted to the relevant designated control dam
- Operators will use safety PPE such as ear plugs and the activity will take place during the day. Stakeholders will be notified of all blasting schedules if blasting is employed
- Fire extinguishers will always be available on the site. See a full specialist study attached as appendix 13.

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13.2.2.4 Operational phase

13.2.2.5 Haul road design

Three separate scenarios will be evaluated based on the RoM tonnes per month (tpm) that the open cast pits will be delivering. These include 10, 20 and 30 heavy vehicles per hour on long-haul routes.

13.2.2.6 Discard/mineral residue deposits management

For a designed scenario, the ADT will operate as close as possible to the receptors, while remaining on the project footprint. The assessed scenario will consider a direct line of sight from the residue deposit in relation to receptors, simulating times when equipment operates at the highest point on the footprint. It should be noted that berms would likely be implemented on the footprint of the project (e.g. a 2m-high berm on project footprint), but noise sources can extend over these berms (e.g. exhaust port above cabin of heavy equipment).

13.2.2.7 Closure and decommissioning phase

In general, removal and rehabilitation activities have a significantly lower noise impact than the construction and operational phases. The closure phase will be consolidated and considered the same as the construction phase for the following reasons:

- Removal and rehabilitation activities are generally less intense than construction and operational activities
- Noise levels are lower and will be limited to daylight hours, reducing the noise impact significance
- The impact will be similar or less than the construction phase impact.

13.2.2.8 Post-closure phase

No potential noise impact is envisaged during this stage as per our desktop study.

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14 SITE OF ARCHAEOLOGICAL AND CULTURAL INTEREST

The heritage report was outsourced to and complied by Integrated Specialist Services (Pty) Ltd. The methodology used was a desktop study followed by field surveys. The field assessment was conducted according to generally accepted HIA practices and aimed at locating all possible heritage objects, sites and features of cultural significance on the proposed mining right application site. Initially, a drive-through was undertaken around the proposed mining right application sites as a way of acquiring an archaeological impression of the general area. This was followed by a walk down survey in the study area, with a hand-held GPS to record the location/position of each possible site. Detailed photographic recording was also undertaken where relevant. The findings were then analysed in view of the proposed mining development to suggest further action. The result of this investigation is a report indicating the presence/absence of heritage resources and how to manage them in the context of the proposed mining development.

The field survey was undertaken on the 2th of July 2019 by a team of two archaeologists and an assistant. The study team covered the entire mining right application site because it is cleared and there are farm tracks and access roads. The mining right application sites were surveyed through farm tracks, access roads, main roads and public roads which cut across the sites. The main focus of the survey involved a pedestrian survey which was conducted across the proposed mining development site. The pedestrian survey focussed on parts of the project area where it seemed as if disturbances may have occurred in the past, for example bald spots in the grass veld; stands of grass which are taller that the surrounding grass veld; the presence of exotic trees; evidence for building rubble, and ecological indicators such as invader weeds.

The literature survey suggests that prior to the 20th century modern agriculture and associated infrastructure; the general project area would have been a rewarding region to locate heritage resources related to Stone Age and particularly Iron Age and historical sites (Bergh 1999: 4). However, the situation today is completely different. The study area now lies on a clearly modified landscape that has previously been cleared of vegetation but is now dominated by corn fields and a continuous sweep of tall grass and shrubs that limit ground visibility. Several farm infrastructure developments, ploughed fields and farm roads and other infrastructure developments dominate the project area.

14.1 Consultation

The EIA public participation process was conducted by the EAP and specialists. The EIA public participation process invited and addressed comments from affected communities and all registered heritage bodies on the matters related to the proposed mining project including heritage concerns that may arise as a result

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of the project. Integrated Specialist Services (Pty) Ltd team requested land owners to declare graves that may be located in their farms and as a resulted, graves were identified.

14.2 Burial Grounds and Graves

Human remains and burials are commonly found close to archaeological sites; they may be found in abandoned and neglected burial sites, or occur sporadically anywhere as a result of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human remains on the landscape as these burials, in most cases, are not marked at the surface. Archaeological and historical burials are usually identified when they are exposed through erosion and earth moving activities or infrastructure developments such as power lines and roads. In some instances, packed stones or stones may indicate the presence of informal pre-colonial burials. The field survey recorded three informal burial sites within the proposed mining right application site. The burial sites were recorded as GMRBS 1, GMRBS2 and GMRBS3.

Burial GMRBS1 was recorded near farm dwellings. The site is located at GPs coordinates S26° 15' 43.6".and S29° 39' 18.0" (see Table 19). The site is divided into two clusters suggesting that the graves belong to unrelated families. The first cluster has 9 graves belonging to the Mahamba family and the second cluster has graves belonging to Masemola, Skosana and Motau families. Most of the graves are marked by cement plaster and inscribed headstones. The second cluster has 8 graves and only one grave is marked by tombstones and inscribed headstone. Five graves are traditional graves marked by oval shaped stone piles and distinctive headstones. One grave is marked by cement plaster and headstone while the other one is marked by brick lining. The age of the graves could not be established because the affected families have since moved from the farm. However, farm workers confirmed that the families still live in the Hendrina farming area and can be traced.

Burial site GMRBS2 was recorded near the road to Hendrina. The site is located at GPs coordinates S26° 15' 49.8".and S29° 39' 36.0" (see table 19). The site is fenced and well secured. Most graves are not very visible due to tall grass and years of neglect but the study team estimated that they could be more than 30 graves at this site. Information we obtained from one marked grave suggest that the burial site belongs to the Mphuti Family. The rest of the graves do not have name tags. As such the study team could not obtain important information about the site. Consultation with the nearby farms did not yield conclusive results. The burial site is known by the local community and they confirmed that the families still live around Hendrina farms.

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Burial site GMRBS3 is located on the north western edge of the proposed mining right site (see Table 19). The site has been fenced but the fence has now collapsed. The burial site is located at GPS coordinates S26° 15' 27.3".and S29° 39' 45.6". The site is located near the windmill and reservoir. Most of the tombstones at the site have collapsed, however the study team confirmed that most of the graves belong to the Myeni, Mguni and Sibiya families. Most of the graves are likely to be older than 60 years, one of the oldest burial was done in 1944. Twenty-five graves were recorded at this site. Seventeen are marked by oval shaped stone piles, 5 are marked by brick lining and 3 are marked by tombstones and inscribed headstones.

Burial grounds and gravesites are accorded the highest social significance threshold (see Table 19). They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with during any proposed development. It is important to note that the possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present (see appended Chance Find Procedure). Although the possibility of encountering previously unidentified burial sites is low at the mining right application area, should such sites be identified during subsurface mining, they are still protected by the NHRA and the Human Tissue Act.

The farm has historical buildings and also grave site which are regarded as protected and will be buffered out. The above is illustrated with the images on Table 19 below and a full heritage impact assessment is enclosed as part of appendices.

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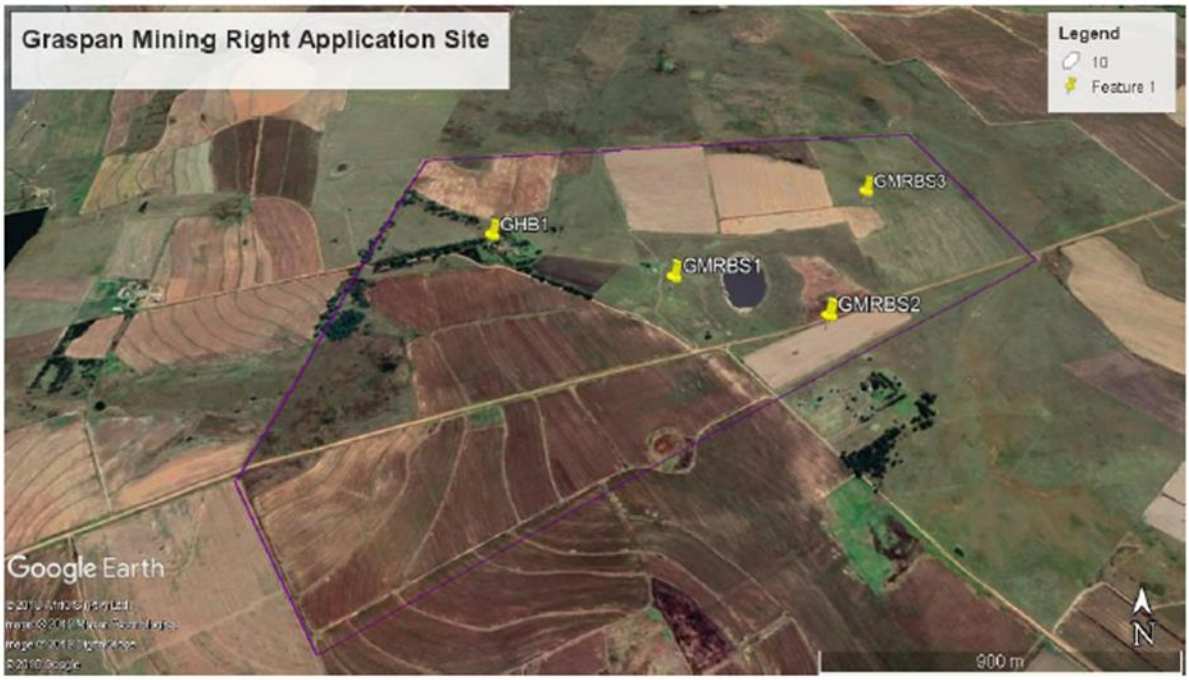
Table 20: Historical buildings and Grave site.

Location of burial sites and historical buildings located within the mining right application site (Mlilo 2019)

Historical farmstead within the proposed mining site.

Farm structures associated with historical building.

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Harvested field. Note that the entire site is used for agriculture except for few patches near features such as the pan.

Derilic farm dwelling site.Note that the site is marked rubble which is not conservation worth.

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Showing graves at burial site GMRBS1.

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15 SOCIO-ECONOMIC CHARACTERISTICS

15.1 General

The Graspan Mine is to be located in the Mpumalanga Province. The mine lies at Msukaligwa Local Municipality under (Gert Sibande District Municiplaity).

15.2 Locality

Msukaligwa Local Municipality, is a South African Local Municipality situated in the Gert Sibande District Municipality, of Mpumalanga. Ermelo ward 19 is the Seat of the municipality. The geographical area measures 601600ha in extent (Source: Municipal Demarcation Board).

Figure 44: Locality map

15.3 Population and development analysis of Nkomazi municipality

15.3.1 Population size and composition

Msukaligwa population dynamics is based on statistics derived from Statistics South Africa 2001 & 2011 census, 2016 Community Survey data, the Gert Sibande District Municipality and other sources. Statistics South Africa data had been used for the demographics and where data could not be derived from Statistics

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South Africa, other sources had been used. The population of Msukaligwa shows a grown of 31.9% from 2001 to 2016 at an average annual growth of 2.1% and grew with 39795 persons.

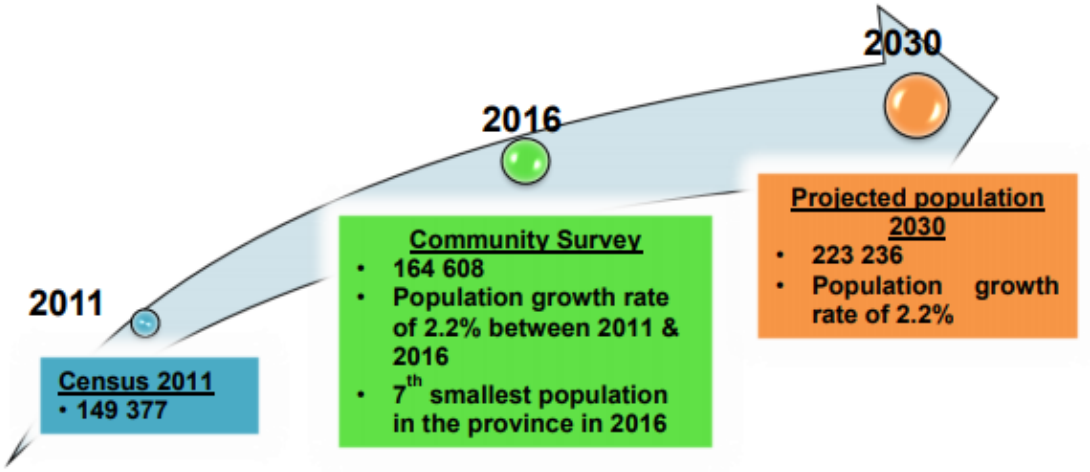

Figure 45: Msukaligwa Population Data and Projection

15.3.2 Population age and sex composition

The graph below, depicts the population growth in age groups with age group 0 – 14 comprising 45761 persons or 28% of the total population and 15 – 34 comprising of 67783 persons. The youth population contributes 41, 2% of the total population of Msukaligwa being the largest group in the population. With the youth population contributing a larger percentage of the population, this is a clear indication that most of the youth are joining the job market implying that the municipality together with sector departments and NGOs must proactively engage in a joint effort to address issues of unemployment, skills development, provision of basic services and housing. According to the 2016 Community Survey data, as compared with the previous two Census data, a drop in a number of females can be observed as females contribute 49.9% and males 50.1% of the total population of Msukaligwa municipality. Female headed households are at 37.8% and child headed household of ages 10-17 years is 0.6% in 2016.

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Age Groups	2011			2016 (Community Survey)		
	Male	Female	Total	Male	Female	Total
0-4	8301	8273	16574	8818	8886	17 704
5-9	7590	7271	14861	7433	7109	14 542
10-14	7030	6944	13974	6774	6741	13 515
15-19	7532	7542	15074	7860	7904	15 764
20-24	8089	7908	15997	8853	8933	17 786
25-29	7969	7520	15489	9461	9600	19 061
30-34	5829	5359	11188	8155	7017	15172
35-39	4794	4741	9535	6117	5843	11 960
40-44	4125	4191	8316	4823	4551	9 374
45-49	3427	3921	7348	3775	3567	7 342
50-54	3001	3238	6239	2942	3151	6 093
55-59	2417	2673	5090	2847	2727	5 574
60-64	1656	1970	3626	1815	2102	3 917
65-69	969	1192	2161	1360	1496	2 856
70-74	649	1082	1731	788	1331	2 119
75-79	365	638	1003	301	589	890
80+	370	801	1171	319	620	939
TOTAL	74113	75264	149377	82442	82166	164608

Figure 46: Msukaligwa Population Breakdown by Age and Gender

Source: Statistics South Africa, Census 2011 and Community Survey 2016.

15.3.3 Population Pyramid

Figure 46 and 47 below depict the population pyramids for the year 2011 and 2016 according to age groups. When comparing the 2011 and 2016 population pyramids, it is evident that there is a significant change on the population growth patterns between the age groups 5 to 29 years. The most significant changes appear in the age groups 25 – 29 with a significant increase while age group 5 – 19 shows a decrease. Though the age group 20 – 24 almost remained the same between 2011 and 2016, there is a great increase on both males and females on the age groups 25 - 34 who are the youth population which may suggest in migration for job opportunities as this group forms a larger part of the labour market.

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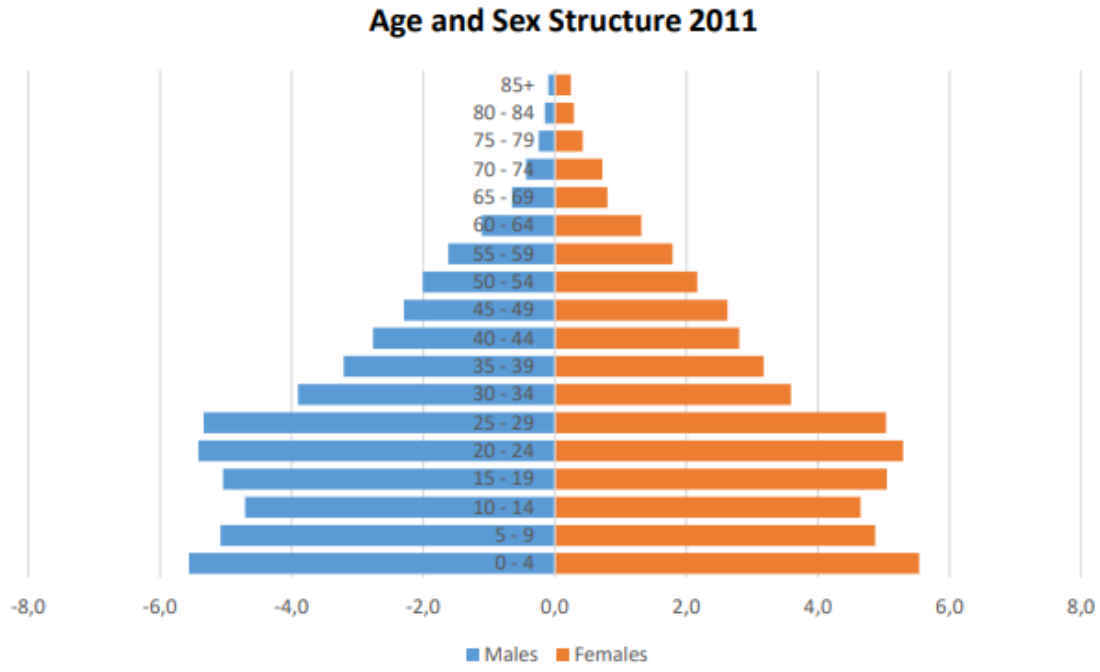

Figure 47: Population Pyramid, 2011

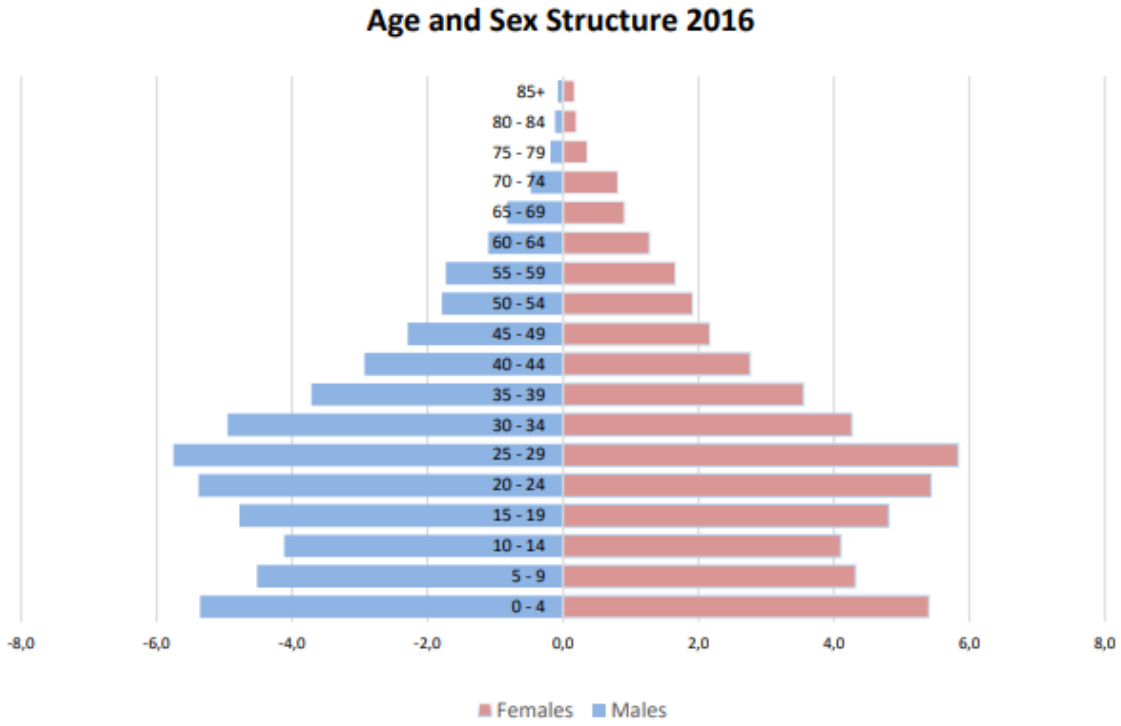

Figure 48: Population Pyramid, 2016

Source: Statistics South Africa, Census 2011 and 2016.

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15.3.4 Population groups

Table 20 below reflects that the population of Msukaligwa local municipality grew with 15 231 persons during the period 2011 to 2016 with an annual average growth of 2.2%. Noticeably is the decrease on the white and Asian population over the past five years though while observing no change on Coloured community. According to Stats SA (2016 Community Survey - CS), Msukaligwa's population increased from 149 377 in 2011 to 164 608 people in 2016 which comprises the 11th largest population in the province and 14.5% of total population of Gert Sibande in 2016.

Table 21: Total Population by Group

Population Group	2011		2016	
	No.	%	No.	%
Black African	131625	88%	150823	91.7%
White	14707	10%	11288	6.8%
Coloured	892	0.6%	1004	0.6%
Indian or Asian	1678	1.1%	1493	0.9%
Other	475	0.3%		
Population	149377	100%	164608	100%

Source: Statistics South Africa, Census 2011 and Community Survey 2016.

Table 21 below reflects population and household figures within Msukaligwa Municipality as extracted from GSDM WSDP 2010 - 2014 and Statistics South Africa 2011 census. The municipality is predominantly rural in nature with key anchor towns that dominate the urban settlements. These create a big challenge for the municipality to provide services especially at the rural or farmlands as coordinated planning and development became expensive in services provision. The Municipality also comprises of Mining operations, Timber Industries, Agricultural Land, Transport and Tourism areas as its economic base. Most of the basic services are rendered within the municipality though some rural areas are still faced with some challenges in the provision water, sanitation and electricity. There is a backlog of 1.5% of households without hygienic toilets, 11.1% without electricity and 6.7% without piped water. Further challenges include lack of safe and reliable water supply, inadequate roads and ageing services infrastructure.

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Table 22: Msukaligwa Local Municipality Demographics per Unit and Households

Unit	Ward	2011		2016 (Community Survey)	
		Population	Households	Population	Households
Ermelo	7,8 , 16	34714	9487	38251	11840
Wesselton	1-6, 9, 17	52599	15577	57968	19446
Breyten	13	8887	2289	9793	2857
KwaZanele	14	5926	1657	6530	2068
Chrissiesmeer	19	2454	741	2704	925
KwaChibikhulu	19	3427	1034	3776	1290
Davel	10	1187	304	1308	379
KwaDela	10	3478	887	3832	1107
Lothair	12	32	8	35	10
Silindile	12	1384	346	1525	432
Silindile	15	5758	1484	6345	1852
New Scotland	15	202	52	223	65
Warburton & farms	19	550	168	606	210
Nganga	19	2012	606	2217	756
Sheepmoor	11	2841	628	3130	784
Rural Ward 9	9	2461	690	2712	861
Rural Ward 10	10	3817	979	4206	1222
Rural Ward 11	11	4445	965	4898	1204
Rural Ward 12	12	1877	494	2068	617
Rural Ward 13 & 14	13 & 14	512	128	564	160
Rural Ward 15	15	4142	1086	4564	1355
Rural Ward 16	16	216	57	238	71
Rural Ward 18	18	6456	1265	7114	1579
TOTAL		149377	40932	164608	51089

Source: Statistics South Africa, Census 2011 & Community Survey 2016

15.4 Educational Levels

Statistics South Africa, 2016 Community Survey data indicates that the population in Msukaligwa aged 20 and above completed grade 12 which is an increased from 33 673 in 2011 to 43 234 (increase of 9 561) in 2016 being an increase of 28.4% for the period under review. Msukaligwa's grade 12 pass rate improved from 74.1% in 2011 to 77.8% in 2016, which was the 3rd highest in the District and 7th lowest of the municipal areas of the Province. According to basic education data obtained from the District Municipality's IDP, Grade 12 pass rate for Msukaligwa was 82.3% and 80% in 2017 and 2018 respectively which show a decrease and remains a concern. From table 22 below, shows a decrease of 9.6% of persons with no schooling between the years 2011 and 2016. In terms of the Millennium Development targets, we must ensure that by 2015, children everywhere, boys and girls alike will be able to complete a full course of primary schooling. As a municipality we should therefore provide necessary support to the Department of

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education ensure that this goal is realized. Generally there is an overall improvement at all levels of education over the past 5 years.

Table 23: Levels of Education

Education Indicators	2011	2016
Number of people 15+ with no schooling	12 213	11 030
% Population 15+ with no schooling	8.2%	9.6%
% Population 15+ with matric and post matric qualification (%)	23.6%	39.6%
% Functional Literacy rate (%)	51.4%	42.7%

Source: Statistics South Africa, 2011 and 2016 Community Survey.

15.4.1 Educational Facilities

The table 23 below reflect the number of educational facilities within Msukaligwa municipality and as indicated only one FET College is located within the municipality. Taking into consideration the way in which the municipality is growing and the shortage of skills within communities, there is a need for at least a tertiary institution within the District. With the development of Ermelo extension 32, 33 and 34 with a total of ± 2134 housing units and neighbouring New Ermelo settlement with ± 1650 housing units there is a need for a high school in that area and the development of Khayelihle close to Emadamini and Thusi Ville, additional Primary Schools and High schools are needed in addition to the schools mentioned in the table below.

Table 24: Educational Facilities

Educational facilities	
Facility	**Number**
No. of Primary Schools	71
No. of High School	6
No. of Combined Schools	12
No. of Secondary Schools	11
No. of Tertiary Education Facilities	0
No. of FET Colleges	1
No. of Training Centres/Adult Education	9
No. of Private Schools	3
Day Care Centres	40

Source: Municipality, Dept of education & dept. of Social Development.

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15.5 Employment

Table 24 below depicts the labour force comparison within Msukaligwa Municipality for the period 2011 to 2016. Unemployment rate stood at 23.6% in 2016 (HIS Global Insight figures) which is a decreased of 3.2% to 26.8% in 2011. The economically active persons are showing a reduction in 2016 when compared to 2011 figures which may imply that people are being absorbed by the labour market or retiring as figures show an increase on those persons that are not economically active. There is still a lot be done in dealing with the unemployment challenge which the local municipality, district municipality, business/private sector and government sectors should collectively work together to develop strategies that will deal with this problem.

Table 25: Employment

	2011	2016
Employed	41,698	43,751
Unemployed	15,267	15,084
Economically active	56,969	53,208
Not economically active	51,476	52,565
Total	149,377	164,608

Source: Statistics South Africa, Census 2011 and 2016 CS

According to information derived from the Socio Economic Profile report by the Provincial Department of Economic Development and Tourism, the unemployment rate for females and males are 31.4% and 18.1% respectively while youth is at 34.5% in 2016.

15.5.1 Sectors of Employment and their Contribution to the Regional Economy

The municipality comprises a number of sectors that contribute to the regional economy and providing employment to the people of Msukaligwa and surrounding areas. The table 25 below depicts percentage of employment per sector with the leading industries in terms of employment being Trade, Community Services and Agriculture and with 23.7%, 19% and 11.5% respectively. There is a significant increase in the Trade sector and a decrease of 8.8% and 1.8% in Agriculture and Community Services sector respectively in the period 2012 to 2015.

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Table 26: Employment per Sector & Contribution to Regional (Gert Sibande) GVA

	2012		2015	
	Employment	Contr. to GVA	Employment	Contr. to GVA
Agriculture	20.3%	14.4%	11.5%	14.6%
Mining	9.8%	10.8%	7.7%	11.5%
Manufacturing	5.4%	0.6%	7.8%	0.8%
Utilities	0.7%	8.4%	0.8%	9.5%
Construction	5.3%	6.9%	3.9%	7.4%
Trade	17.7%	18.9%	23.7%	20.4%
Transport	5.4%	28.3%	6.9%	28.7%
Finance	5.7%	25.1%	9.6%	24.3%
Community Services	20.8%	21.2%	19.0%	21.4%
Private Households	8.9%	-	9.1%	-
Total	100%	11.8%	100%	13.4%

Source: Mpumalanga Department of Finance 2015

Table 27: Household Income per month

Income Category	2011	%
No income	59422	39.8%
R 1 - R 400	26450	17.7%
R 401 - R 800	5838	3.9%
R 801 - R 1 600	17665	11.8%
R 1 601 - R 3 200	9719	6.5%
R 3 201 - R 6 400	7081	4.7%
R 6 401 - R 12 800	5633	3.8%
R 12 801 - R 25 600	3678	2.5%
R 25 601 - R 51 200	1130	0.8%
R 51 201 - R 102 400	219	0.1%
R 102 401 - R 204 800	111	0.1%
R 204 801 or more	95	0.1%
Unspecified	10017	6.7%
Not applicable	2319	1.6%
Total	149,377	100%

Source: Statistics South Africa, census 2011

During the operational phase, the mine will employ approximately 250 permanent employees, ranging from skilled to semi-skilled and unskilled workers with varying education levels. It is estimated that 50 illiterate workers will be employed to fill unskilled vacancies. Skilled positions will include top and senior

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management, junior qualified and experienced specialists, technical and academically qualified workers, management, supervisors, foremen and superintendents, and includes:

- Mine Manager
- Environmental Specialist
- Technical Superintendent
- Mine Planner
- Surveyor
- Production Geologist and Geologist Assistant
- Secretary, Accountant and Office staff
- Processing Plant Manager
- Boiler Marker
- Electricians, etc.

Semi-skilled employment includes positions with discretionary decision-making power, such as:

- Shuttle car operator and vehicle operator
- Water tanker operator
- Pump station attendants
- General crew, etc.

Employees will be responsible to:

- Assist in career development plan
- Be motivated and willing to participate in career development
- Acquire competencies as provided by Grapan Mine
- Take charge of self-development
- Adhere to service obligations

A skills, training and development policy and plan, together with social and labour plan has been drawn up with the purpose to provide guidelines the implementation and maintenance of comprehensive training and development strategies and for procedures.

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16 TRAFFIC MANAGEMENT

There are two alternative route system that can be used to access the proposed site, the study will assess the two routes alternatives and provide current roads and traffic conditions. The roads to be affected by the proposed mine activities are the following:

(i) The N11 Road from Middleburg through Hendrina, Ermelo, Amersfoort, Volkrust and Newcastle to Ladysmith where it joins the N3 Road;

(ii) R38 from Bethal through Hendrina, Carolina and Badplaas to the R40 in Barberton;

(iii) Sluiter Street which is a local street in Hendrina Town connected to the N11;

(iv) Gravel Road which connects Sluiter Street (Hendrina) with Davel Town; and

(v) Internal Farm Roads used by the land owner/users.

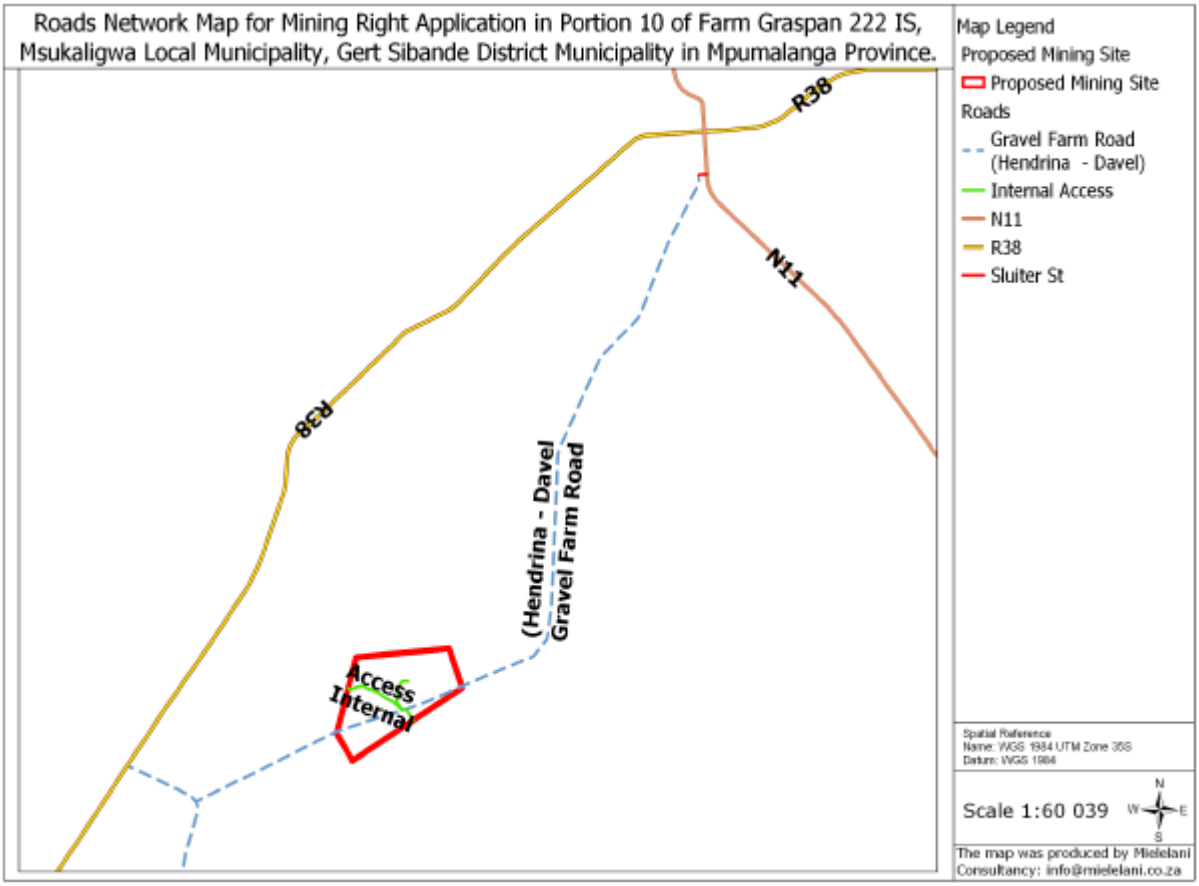

Figure 49: Associated routes that are close to the mine area.

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The purpose of this specialist traffic and transportation study is therefore to estimate the daily traffic that the proposed construction and operations is likely to generate. Furthermore, this study will endeavour to assess the impact of this additional traffic on the surrounding road network and make recommendations for mitigation or improvements.

16.1 Access roads

The site being characterised by both mining and agricultural activities was found to have relatively high traffic volume consisting of both the heavy and light vehicles. The N11 a Class 2 road has the highest traffic volume with no peak hours within the vicinity of the proposed site, the R38 also have moderate traffic volume consist mainly of heavy trucks also with no peak period. Other roads to be used during mining are secondary roads with very low traffic volumes and all busier throughout the day.
The two routes alternative system will follow be as follows:

(i) From site into the Gravel (Hendrina – Davel Road), into the R38 and then the N11; and
(ii) From site into the Gravel (Hendrina – Davel Road), into Suiter Street and then the N11.

16.2 The Junctions and their existing conditions

For a road network with sufficient capacity, one would expect the PM peak traffic patterns to be close to the inverse of the AM peak, which in this case is not so. The peak hours where considered to be early morning with rush to work, the afternoon during lunch hours and the late afternoon when people knock-off. During observations the rush hours' assumptions only applied to light vehicles as the heavy vehicles flow was constant throughout the day on all observed routes.

16.2.1 The N11 Road and Sluiter Street Junction

The junction (Images below) is located within Hendrina Town; the four-way junction uses the two stops system with the N11 having free flow with the stops signs on the Sluiter Roads. The N11 road is a Class 02 road with LOS of B at this intersection whereas the Sluiter St is a Class 5 road with LOS of B because of its fewer vehicles. The traffic volumes as well as queuing information is provided in Table 27 below. The queuing assessed was for the Sluiter Street as the N11 was free flowing with no delays. The queuing observed on the Sluiter St Stop into the N11 was a maximum of two vehicles at a time. The queuing at the stop sign on Sluiter Street was found to be highly influenced by the traffic flow on the N11 with no traffic control, the two one-way lane enabled for the vehicles turning left into the N11 to be smooth, with delays

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on vehicles turning right. The traffic volume on the N11 however did allow for right turn with a maximum of two queuing vehicles at approximately 30 – 90 seconds. The average traffic rate on the N11 is three vehicles per minute on a double lane route which still creates a road level of service of B, The LOS of the Junction is however C.

Table 28: The N11 Road and Sluiter Street Junction Traffic Condition

Road Name	Road Class	Service Level	Traffic Count				Traffic Split (%)		Queuing (Veh)		
			AM	Noon	PM	All day	In	Out	AM	Noon	PM
Sluiter St	05	A	22	19	24	103	46	54	03	-	03
N11 - Continue	02	B	310	289	316	1535	51	49	-	-	-

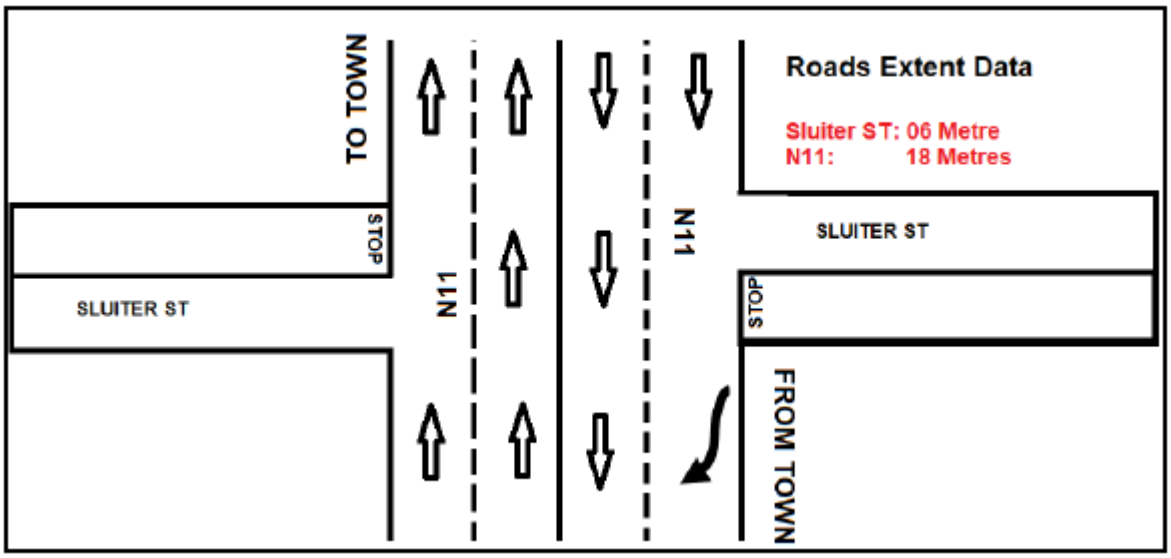

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Image of the Sluiter St - N11 Intersection

16.2.2 Sluiter and Gravel Road (Hendrina – Davel/Bankpan)

This junction is located at 15 8.63 metres from the Sluiter – N11 junction. The junction is controlled by a four-way stop controlling traffic from the Gravel Road, The Sluiter Road and the Voortrekker Street which

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is opposite of the gravel road. All the roads at this intersection have the same Road Class of 05: Local Street. The LOS for Sluiter is A; Gravel – A and Voortrekker – A. The traffic count for 9 hour shift from 07:00 to 17:00 was 106 in total for the junction, on average each car had an allowance of 05 minutes before impacting on traffic flow. The traffic flow at the junction was therefore established as smooth flow with no delays.

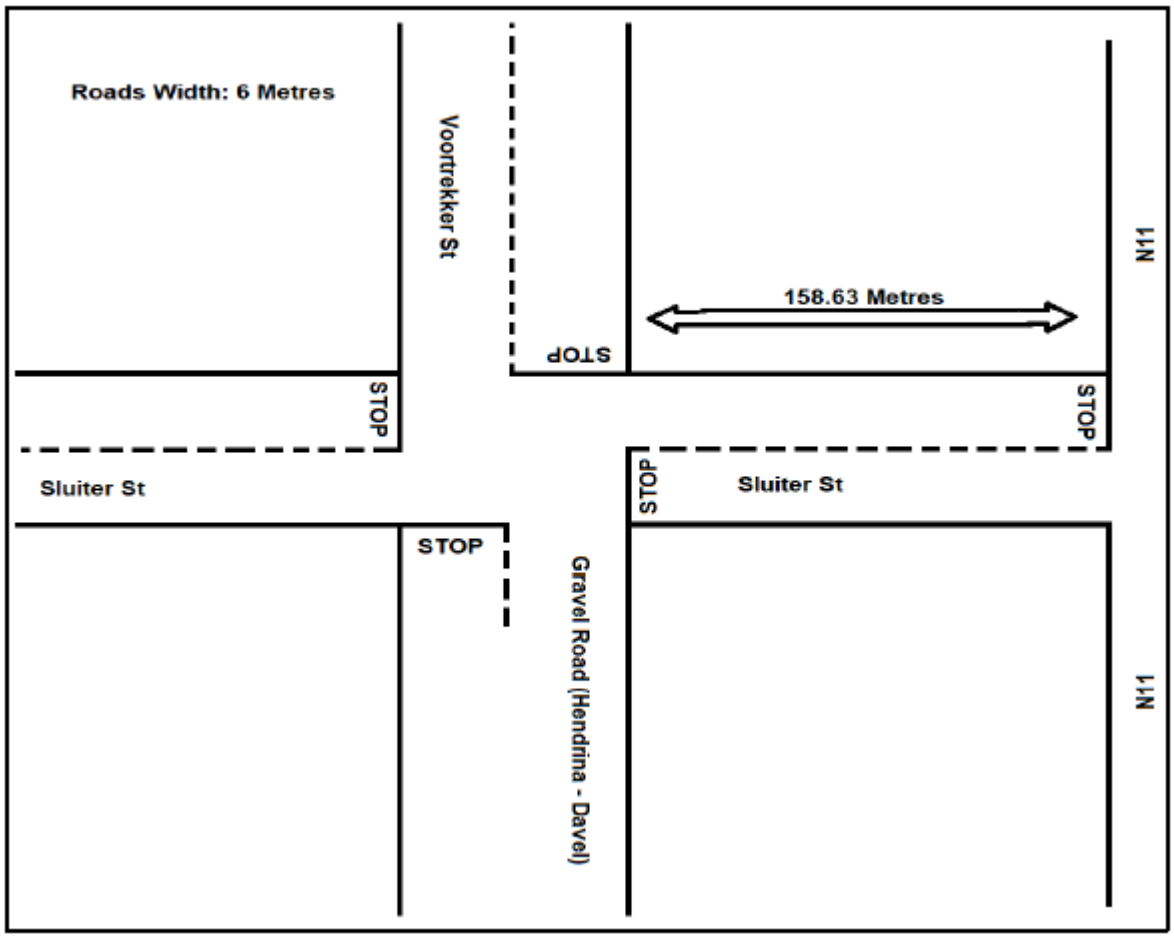

Figure 50: Gravel Road - Sluiter St - N11

Table 29: Sluiter and Gravel Road (Hendrina – Davel/Bankpan) Junction Traffic Condition

Road Name	Traffic Count				Traffic Split (%)		Junct Queuing (Veh)		
	AM	Noon	PM	All day	In	Out	AM	Noon	PM
Sluiter St – Sluiter St	03	02	03	9	33.33	66.67			
Gravel – Sluiter St	05	04	05	21	60.00	40.00			
Gravel – Voortrekker	0	0	0	2	50	50	02	02	02
Voortrekker – Sluiter St	14	13	16	74	43	57			
Total	**22**	**19**	**24**	**106**	-	-			

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Figure 51: The Sluiter, Voortrekker and Gravel Road (Hendrina – Davel/Bankpan) intersection

16.2.3 Farm Road and Gravel Road (Hendrina – Davel/Bankpan)

This is an un-signalised three-way junction in which the traffic yield rule would apply. The traffic volume for this junction is very low. There was no queuing observed at this junction. An average rate of single car in an hour apply at this junction. The road at this junction all have the same Class of 5: Local Street, and levee of service (LOS) of A. The traffic volumes at this junction has insignificant impact on the road conditions and/or level of service, less than 35 vehicles passes here in a day shift (07:00 – 17:00).

Table 30: Farm Road and Gravel Road (Hendrina – Davel/Bankpan)

Road Name	Traffic Count	Traffic Split (%)		Junct Queuing (Veh)		
	All day	In	Out	AM	Noon	PM
Farm Road	6	50.00	50.00	-	-	-
Hendrina – Davel/Bankpan	26	50.00	50.00			
Total	**32**	-	-			

Figure 52: Internal farm road

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16.2.4 Hendrina – Davel/Bankpan

There is a depot (BKB GainCo. Vlaklaagte) for maize located at this junction which increases the traffic volume especially the heavy trucks. The junction is un-signalised and traffic control is through the application of traffic yield system. The traffic does not have peak and off peak hours but a relatively constant volume from 07:30 to 17:00 consist mainly of trucks to and from the maize depot. No queuing was observed at all the three intersections. There were no delays observed at this junction with an average car passing of 22 cars in an hour.

Table 31: Hendrina – Davel/Bankpan conditions

Road Name	Traffic Count				Junct Queuing (Veh)		
	AM	Noon	PM	All day	AM	Noon	PM
Bankpan – Davel	21	15	22	71	-	-	-
Hendrina – Davel	4	3	4	15			
Bankpan - Hendrina	26	18	29	113			
Total	**51**	**36**	**24**	**199**			

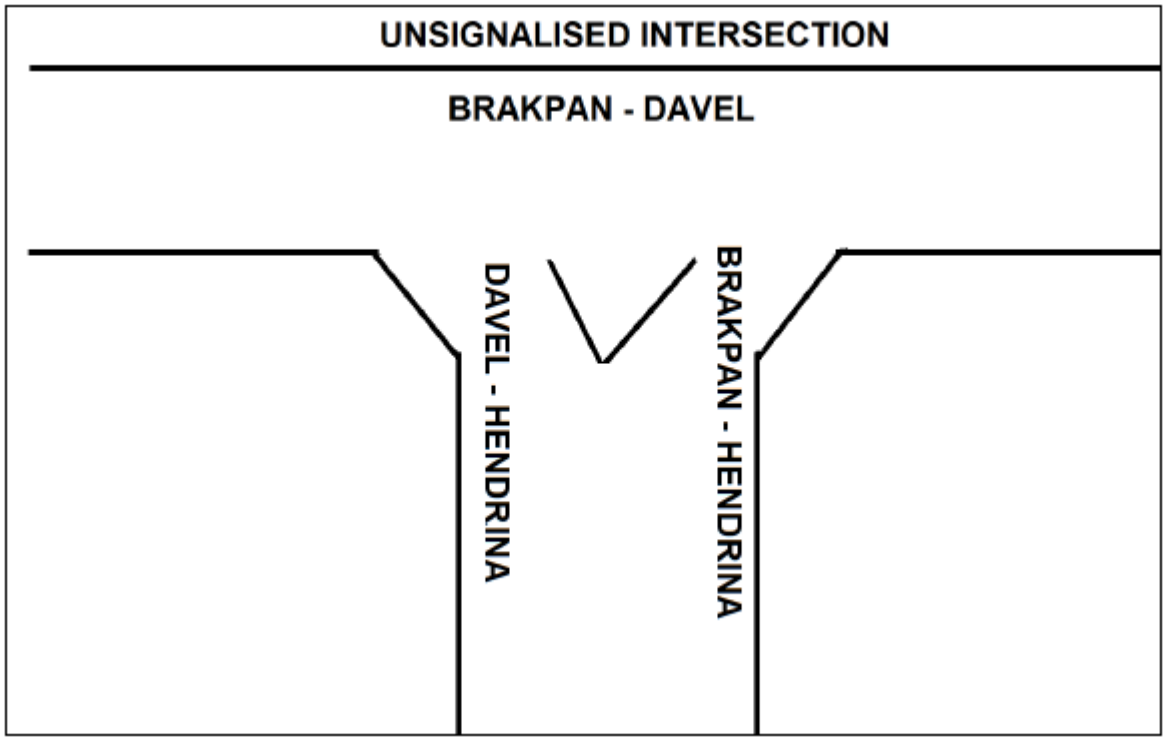

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Figure 53: Gravel Road Junction at the maize depot

16.2.5 R38 Road and Gravel Road (Davel – Bankpan)

The junction is controlled by one stop signal on the gravel road with the R38 free flowing. There was no delay on the R38 as the traffic was freely flowing. The traffic volume on the gravel road was low such that the highest number of cars at the intersection queuing was two at a time. A turning lane exists on the R38 for the Hendrina bound (right turn at the intersection) traffic to avoid slowing down the traffic already on the fast lane. The peak and off peak system only applied to light vehicles and did not affect the heavy vehicles on the R38 road from 07:00 to 17:00. During the peak hours which were established to be 07:00 to 8:30 and 15:00 to 17:00 the crossing had an average of three vehicles per minute which would likely create a delay for the vehicles from the Bankpan-Davel gravel road. The waiting time was observed to be 30 – 45 seconds for the cars at the stop, no waiting for the cars turning left from the R38 into the gravel, whereas the waiting time for the vehicles turning right into the gravel from the R38 was between 20 – 55 seconds.

Table 32: R38 Road and Gravel Road (Davel – Bankpan)

Road Name	Road Class	Service Level	Traffic Count				Traffic Split (%)		Queuing (Veh)		
			AM	Noon	PM	All day	In	Out	AM	Noon	PM
R38	03	A	256	214	263	978	49	51	01	01	01
Davel – Bankpan Gravel	05	A	47	33	51	143	44	56	03	02	03

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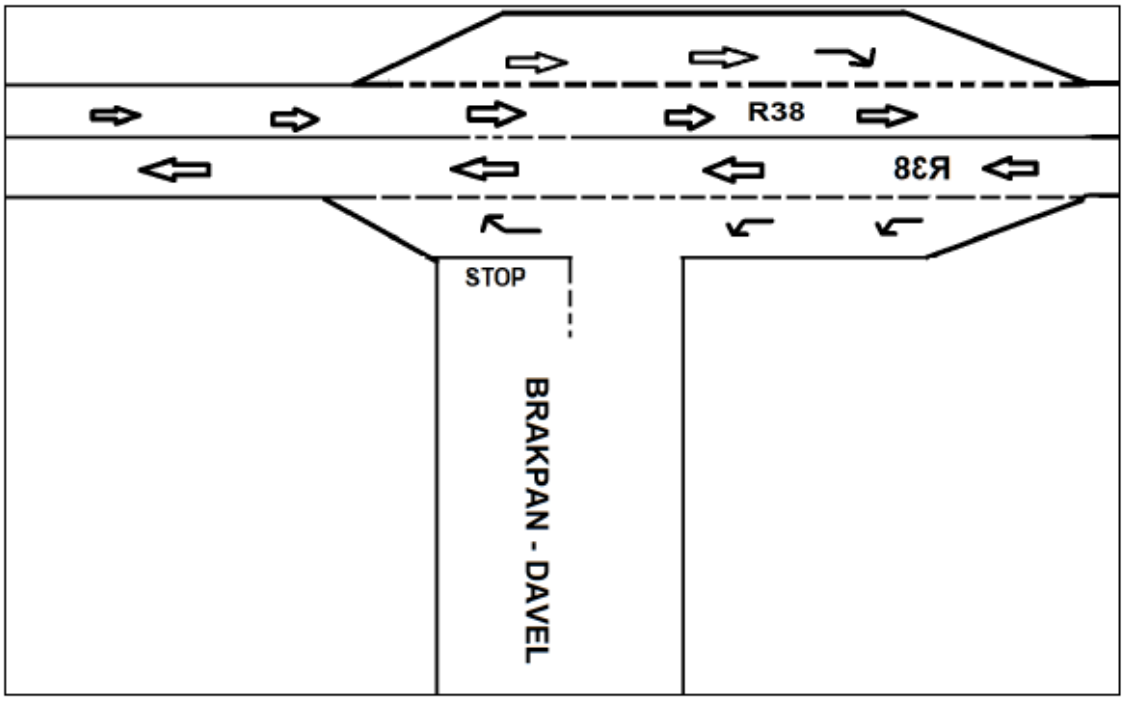

Figure 54: R38 Intersection

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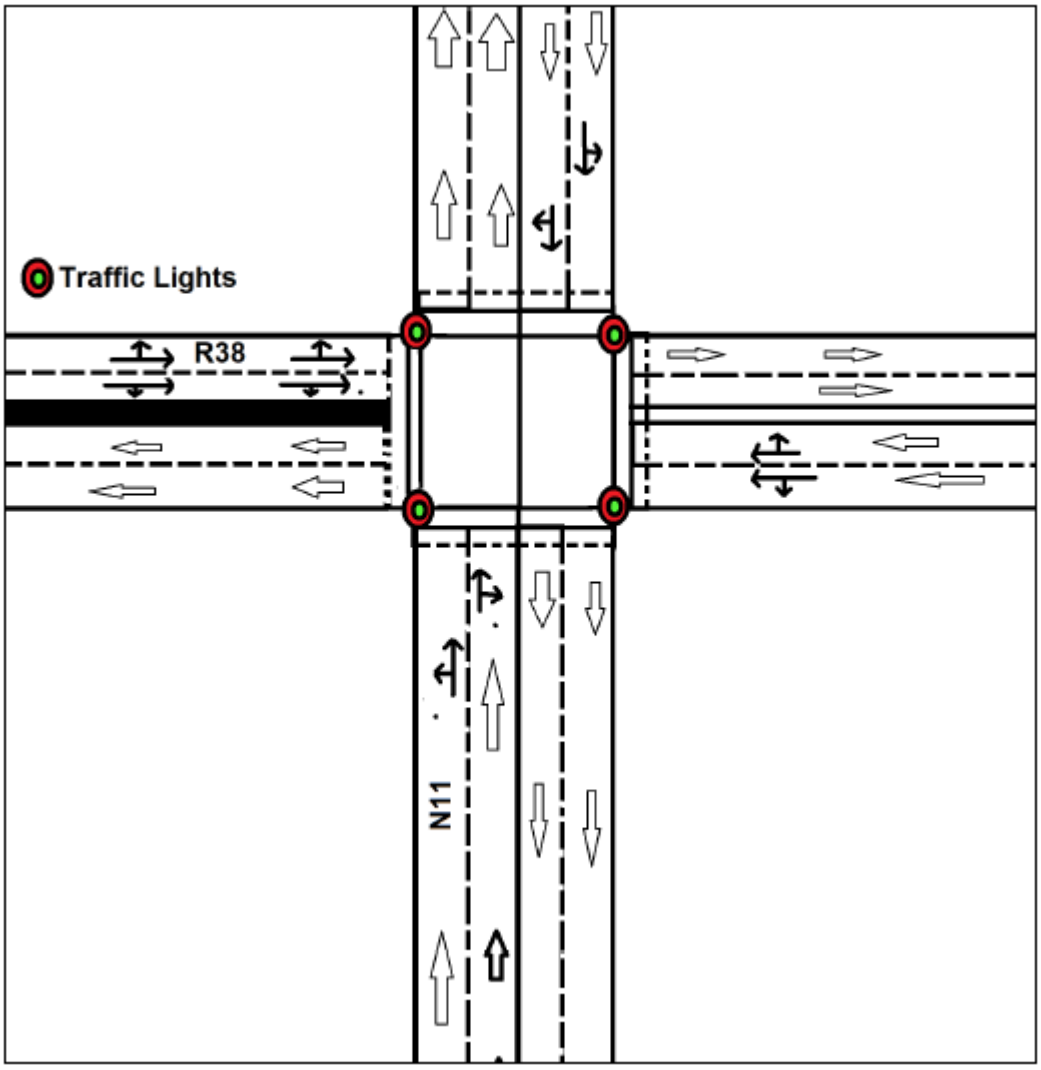
16.2.6 R38 Road and the N11 Road

This a major junction of all the intersection assessed by this study controlled by Traffic Robots. The traffic lights have the same scheduling for both roads i.e. The waiting time at the traffic lights is the same for N11 and the R38 road. The two routes maintain their traffic volumes throughout the day, i.e. from 07:00 to 17:30 the traffic volume was relatively the same consisting of heavy and light vehicles. The Roads at the robots all have two lanes improving traffic flow, i.e. avoiding traffic slow down by left turns. The intersection is illustrated below. The intersection is busier compared to all other intersection and must be avoided. At this junction the traffic flow has LOS of C approaching D.



16.3 Assumptions and limitations

- The distribution of the traffic generated by the proposed activities at Increadable Berachot Mining and Traders (Pty) Ltd project, when fully operational, was assumed based on the distribution of existing site generated traffic that travels on the road network as well as the location of the towns

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and residential areas that will provide the accommodation for the additional labour. In addition, the location of potential suppliers, were also taken into consideration;

- It was assumed that the period 07:00 – 09:00 am, 12:00 – 14:00 and 15:00 – 17:30 are the peak traffic hours; and
- The traffic count and assessment were done only on intersections where the mining vehicle will be travelling i.e. from the farm roads into the local roads intersections and the intersections between the local roads and the N11 and R38.

16.4 Recommendations

As per the traffic management specialist team, the following is recommended:

- Improve the geometrics of Sluiter Road and Bankpan/Davel Road to allow for traffic to turn on designated lines;
- The preferred road must be the Gravel road from the farm into the Sluiter St then the N11, this have fewer traffic and shorter in distance; and
- A three year monitoring program for all the affected road must be developed to assess the effectiveness of recommended measures.

16.5 Current land uses

The current land use of the proposed site includes:

- Livestock Farming: Sheep and Cattles; and
- Crop Farming: Maize.
- Wetlands present on site.

Images of current land use are enclosed below;

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Table 33: Current land use images on the site

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The proposed infrastructure area pre-mining land use is presented on the layout below;

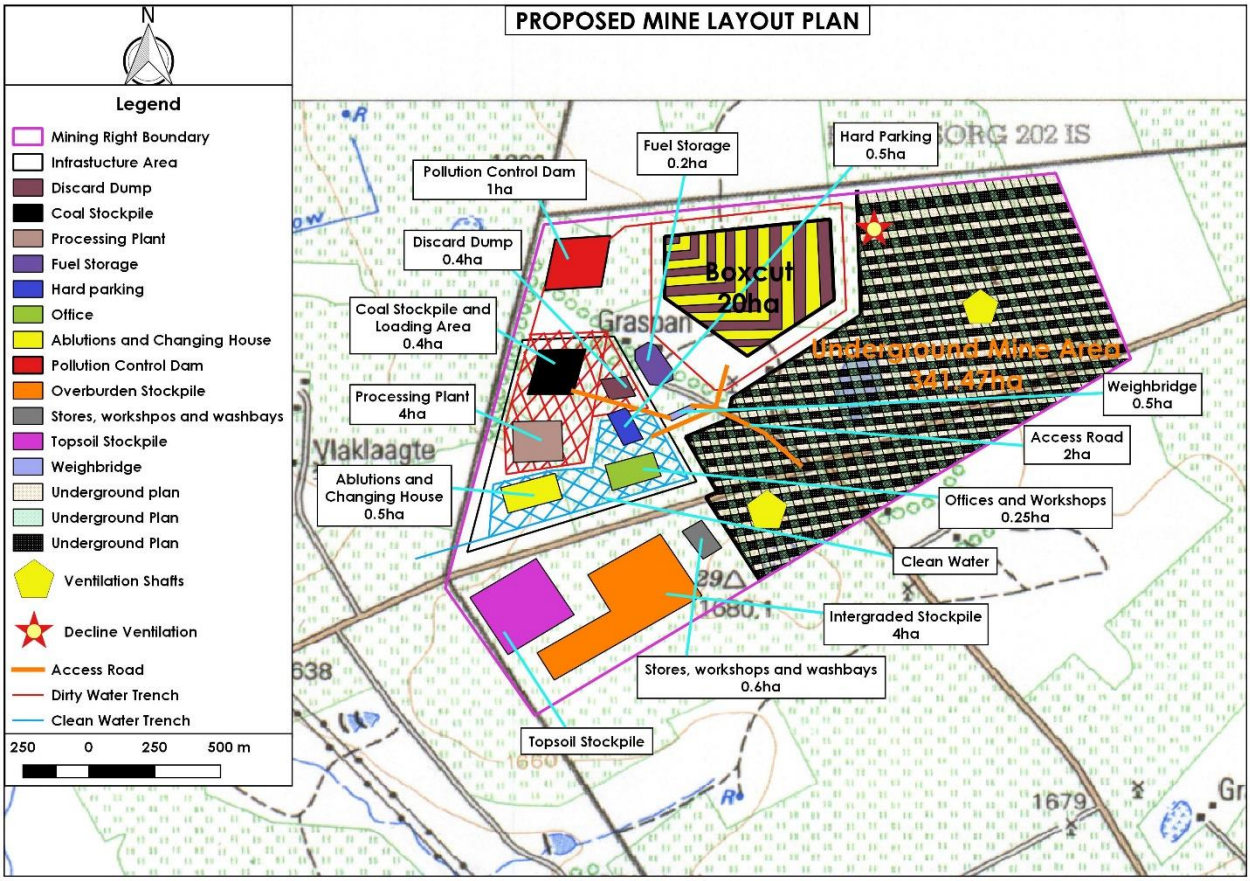

Figure 55: Mine Layout Plan

16.6 Specific environmental features and infrastructure on the site

There are various activities taking place within the proposed site which includes crop and livestock farming; and residential areas. The site activities have influenced vegetation cover within the proposed site. The vegetation covers as determined from ESRI's World Image and Google Earth Pro is approximately 30% and the rest cleared for agricultural purpose. The main agricultural activities within the proposed site are the following:

- Livestock Farming: Sheep and Cattles; and
- Crop Farming: Maize.

There are no streams within the proposed site, however the Olifant River is located at 3.71 kilometers east of the proposed site, the other two unnamed streams are located at 1.0 and 1.5 km east of the proposed site together with Bankspruit River which is located at 3 kilometers west of proposed site.

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The transition from opencast to underground mining, will have limited impact on the sensitivities on site. Specialist studies in terms of sensitivities were conducted as part of the WULA requirements of the project. Specialist studies identified and conducted include:

- Surface water assessment at the river and streams
- Wetlands delineation and present ecological state determination

16.7 Environmental and current land use map

Show all environmental and current land use features.

There are various activities taking place within the proposed site which includes crop and livestock farming; and residential areas. The site activities have influenced vegetation cover within the proposed site. The vegetation covers as determined from ESRI's World Image and Google Earth Pro is approximately 30% and the rest cleared for agricultural purpose. See Figure 56 (A,B & C) below.

The main agricultural activities within the proposed site are the following:

- ❖ Livestock Farming: Sheep and Cattles; and
- ❖ Crop Farming: Maize

There are no streams within the proposed site, however the Olifant River is located at approximately 3.71 kilometres east of the proposed site, Bankspruit stream is located approximately 3 km west of the proposed site and the other two unnamed streams are located at approximately 1.0 and 1.5 km east side of the proposed site.

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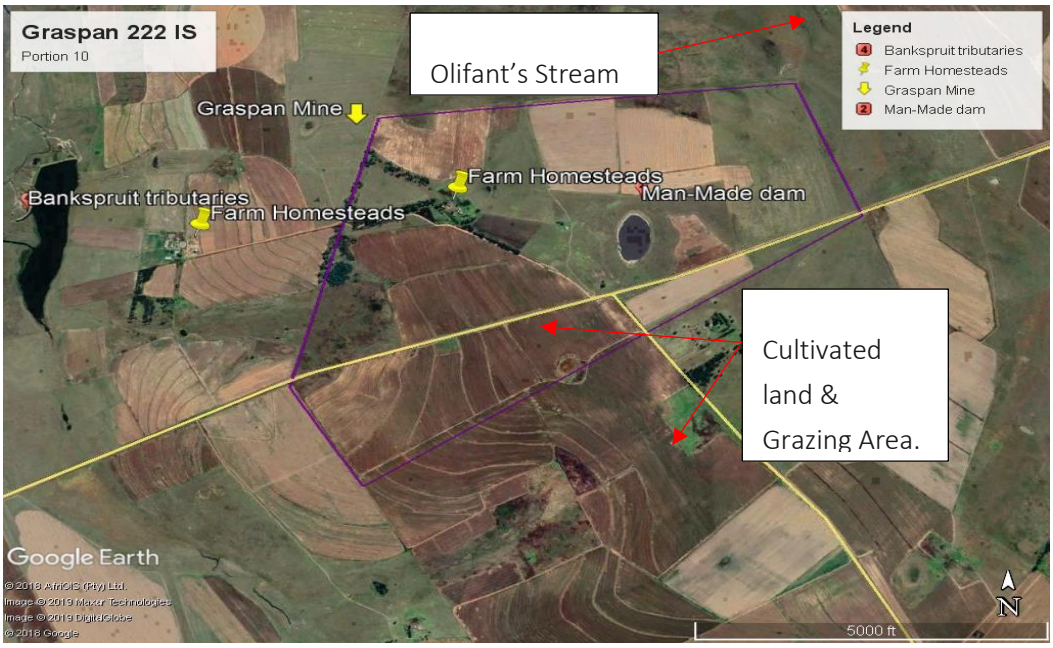

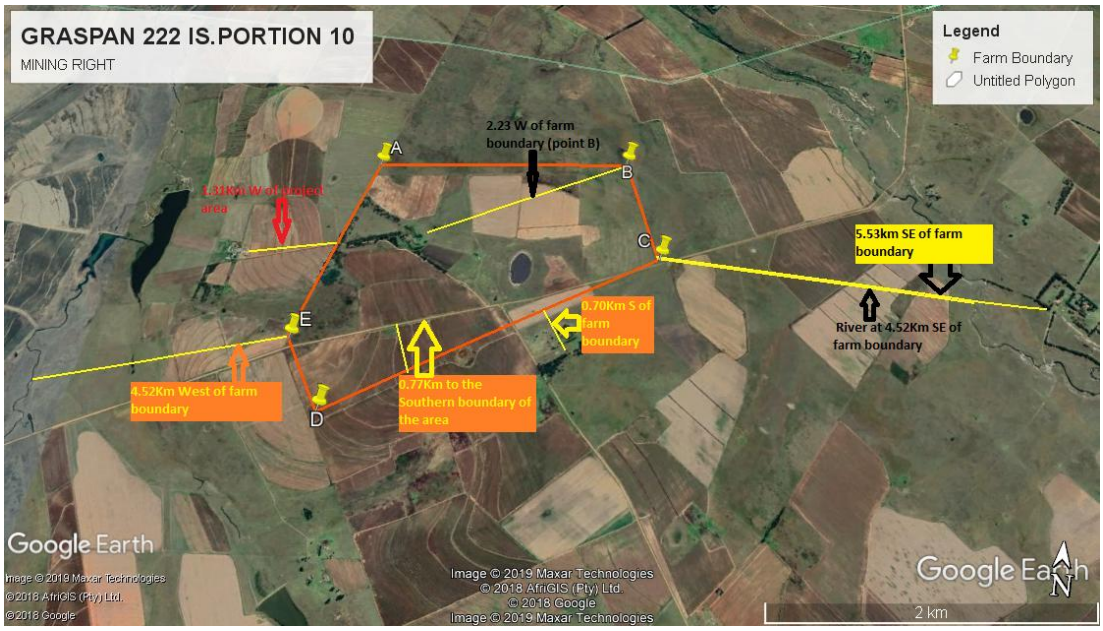

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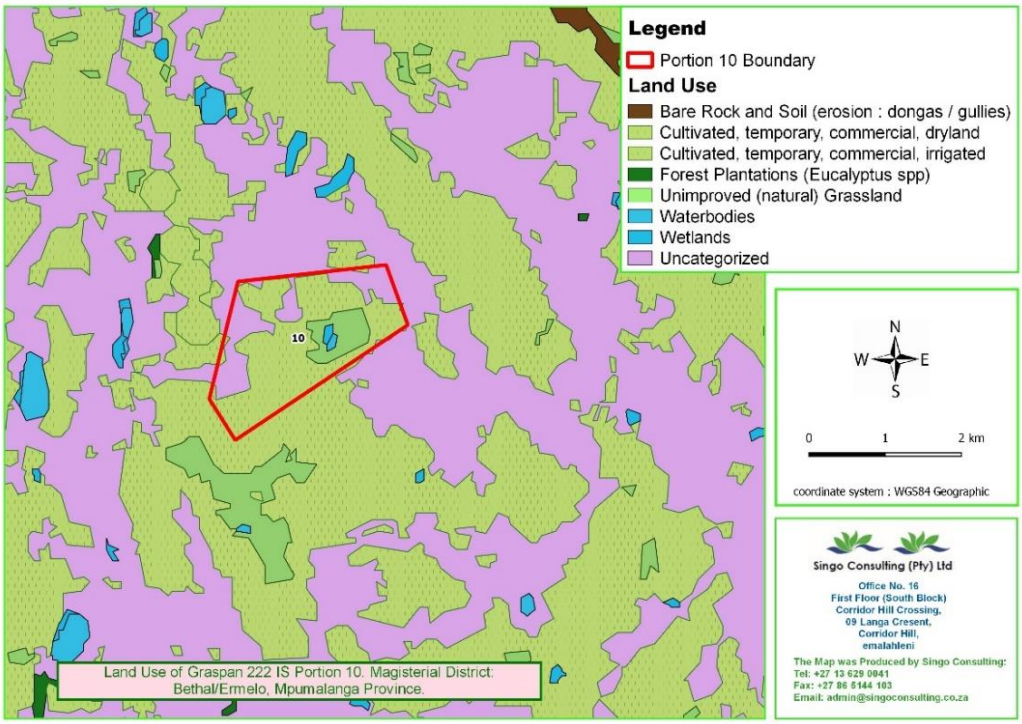

Figure 56: Current Land use maps (A,B & C) on the area.

16.8 Impacts and risks

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

The EIA was undertaken in accordance with the impact assessment methodology as presented in the following section. Comments from stakeholders and responses are listed in a consultation report and are crossly referenced with the mitigation measures in the impact assessment tables.

16.9 Methodology used to determine the significance of environmental impacts

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

The impact identification process commenced by identifying all environmental aspects on site, whether sensitive or not. General environmental aspects that were considered includes:

- Topography
- Geology
- Soils, land use and capability
- Surface water, associated wetlands and aquatic ecosystems
- Groundwater
- Floral and faunal ecosystems
- Ambient environmental noise
- Archaeological and cultural sites
- Local traffic and safety
- Socio-economics, health and safety
- Mine work Programme
- Social and Labour Plan
- Blasting
- Agricultural studies
- Rehabilitation
- Palaeontology study
- IWWMP
- Geotechnical Report
- CPR

All potential environmental impacts resulting from the activities and sub-activities listed in the report were listed under each of the aspects on tables.

As the specialist studies were completed, additional impacts identified through the specialist investigations were added, including impacts identified from the modelling exercises reported in the preceding section. All specialists utilise some form of impact rating like the process detailed in Table 34. The impact rating completed by the specialists were as far as possible translated into the impact assessment process detailed below. As far as practically possible, considering variations in impact assessment methodology by different specialists, the specialist impact assessment is therefore duplicated within a single unified impact assessment process, to allow for all impacts to be assessed in the same way, reducing subjectivity and allowing direct comparative ranking of all the impacts identified during the environmental processes.

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Through the Public Participation Process (PPP), any issues or potential impacts identified by the I&APs were added to the list of potential impacts. All these impacts were then assessed and their significance determined. Impact identification will be a consolidated approach based on Singo Consulting professional experience, specialist expertise and I&AP (including organs of state which are involved in the PPP) input.

The full impact assessment methodology utilised is described below. Impact assessment methods were developed to: (1) identify potential impacts of a proposed development on the social and natural environment; (2) predict probability of these impacts and (3) evaluate significance of the potential impacts. The impact assessment methodology used to determine the significance of impacts prior and after mitigation is presented. The methodology used is as follows:

Table 34: The methodology used

The status of the impact		
Status		Description
Positive:		A benefit to the holistic environment
Negative:		A cost to the holistic environment
Neutral:		No cost or benefit
The duration of the impact		
Score	Duration	Description
1	Short term	<2 years
2	Short to medium term	2 – 5 years
3	Medium term	6 – 25 years
4	Long term	26 – 45 years
5	Permanent	>46 years
The extent of the impact		
Score	Extent	Description
1	Site specific	Within site boundary
2	Local	Affected immediate surrounding areas
3	Regional	Extends substantially beyond site boundaries
4	Provincial	Extends to almost the whole province or larger region
5	National	Affected country or possibly the world
The reversibility of the impact		
Score	Reversibility	Description
1	Completely reversible	Reverses with minimal rehabilitation & negligible residual affects
3	Reversible	Requires mitigation and rehabilitation to ensure reversibility

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5	Irreversible	Cannot be rehabilitated completely/rehabilitation is not viable
The magnitude (severe or beneficial) of the impact		
Score	Severe/beneficial effect	Description
1	Slight	Little effect – negligible disturbance/benefit
2	Slight to moderate	Effect observable – environmental impacts reversible with time
3	Moderate	Effect observable – impacts reversible with rehabilitation
4	Moderate to high	Extensive effect – irreversible alteration to the environment
5	High	Extensive permanent effects with irreversible alteration
The probability of the impact		
Score	Rating	Description
1	Unlikely	<15% sure of an impact occurring
2	Possible	15% - 40% sure of an impact occurring
3	Probable	40% - 60% sure that the impact will occur
4	Highly probable	60% - 85% sure that the impact will occur
5	Definite	>85% sure that the impact will occur
The consequence		= Magnitude + Spatial Scale + Duration + Reversibility.
The significance		= Consequence x Probability.

The rating is described as follows:

Score out of 100	Significance
1 to 20	Low-L
21 to 40	Moderate to Low-LM
41 to 60	Moderate -M
61 to 80	Moderate to high-MH
81 to 100	High-H

The negative impacts are rated according to the degree of loss of a resource due to the particular impact. This is only assessed from the pre-mitigation perspective of the impact. The degree of loss of a resource is evaluated in terms of:

- Low degree of loss: where the resource will recover on its own with no/limited rehabilitation over an observable period
- Moderate degree of loss: where the resource will recover over extended period or with rehabilitation or remedial measures to assist recovery of resource
- High degree of loss: Where the resource cannot be recovered, or the resource will recover over extended time periods

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16.10 Positive and negative impacts of the proposed activity

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

Increadable Barachot Mining and Traders (Pty) Ltd applied for mining right on the existing prospecting right area. The site is therefore considered the preferred site and alternative sites were not considered. This was taken to I&APs and comments and concerns raised focused more on water, pollution, dust, air quality and noise.

16.10.1 Negative impacts on communities

- Potential water and soil pollution resulting from hydrocarbon spills and soil erosion
- Potential of loss of groundwater resources
- Noise
- Influx of persons (job seekers) to site as a result of increased activity and the possible resultant increase in opportunistic crime; and Visual Impact
- Dust pollution
- Increase movements of trucks in the area
- Possible contamination of drinking water from ground water resources
- Visual impact due to shafts

16.10.2 Positive impacts on communities

- The impact will have a positive impact on the local GDP
- Promotion of local business opportunities
- Job opportunities for the local communities
- Possible upliftment of the wards 10 & 19 of Msukwaliga Local Municipality

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

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

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Comments and concerns raised by stakeholders as summarized in consultation report are included and taken into consideration and have informed the mitigation outlined in Table 35 to Table 37.

16.12 Motivation where no alternative sites were considered

The property selected for the overall mining right application are limited to those held under valid Prospecting Right by the applicant; and finally, the coal resource determination and the economic feasibility of mining the coal resource. As much as it is a requirement under GNR632 of NEM:WA to complete an alternatives assessment for mine residue reserves. The position of the integrated dump has been located close to the plant area to minimize material transport and handling over distances and has been placed to avoid water resources and their associated woodland zones as far as possible. The mine residue dump has however been shifted within the greater location to avoid wetlands and buffer zones. Alternatives considered were addressed also in Part A; i (a-e) of this report.

16.13 Statement motivating the preferred site

Provide a statement motivation the final layout that is proposed.

The preferred site was chosen due to the following:

- Position of coal resource;
- The availability of coal reserves
- Depth of coal resource;

The extent of mining and the type of mining is limited by the extent and depth of the coal resource, which has limited space on site for other infrastructure. The site layout as depicted in this EIA/EMPR is based on economic feasibility and reducing environmental impact as per specialist studies. Infrastructure has been placed to avoid water resources and their associated woodland and 100m buffer zones, as well as reducing development footprints in natural grassland areas as far as possible.

Process undertaken to identify, assess and rank impacts and risks of activity on the preferred site

Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.

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The proposed mining area has been analysed by the EAP through a desktop studies to identify any sensitivities that would be impacted by the proposed mining activity. Various specialist studies were identified based on the observations. Physical site visit was undertaken to confirm and expand on identified potential impacts. The phase was combined with public participation to involve the affected community.

Issues and concerns were raised by I&APs, including environmental aspects. Various other studies were conducted that are considered of importance in a mining project and included as specialist studies. The impact assessment methodology utilised in the project. This method was also used for any proposed alternatives. The aim was to use the methodology to determine the significance of impacts before and after mitigation measures were applied.

16.14 Assessment of each identified potentially significant impact and risk

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

The comprehensive impact assessment is included in the following tables. A separate appendix is not provided.

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16.15 Impact assessment for the construction phase

Table 35: Impacts and proposed mitigation measures of activities in the construction phase of the project

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
Construction of access and haul roads	Top Soils	Soils will be stripped and stockpiles with some of the soils used for construction of haulage roads and other access roads that may be required. There is a potential of mixing of topsoil's. Soil negative impact will occur due to the presence of vehicles and equipment's leading to hydrocarbon spills which may cause soil contamination.	M	• Access and Haulage roads will be constructed with uncontaminated materials and/or not containing any carbonaceous rocks that are known to host pyrite mineral. • Enough spill kits will be stored on site, and the stuff will be trained to act when spills occur. • Spill specialist contactor or consultancy will be appointed and be used when needed. • Contaminated soil to be removed and transported by appointed specialist for treatment. • Drip trays to be used for vehicles and equipment's (Drill rigs) that stand overnight.	L
	Vegetation	Vegetation will be removed during the construction of the roads.	M	• Removal and stockpiling of all topsoil's to be used in final rehabilitation. • Access roads and haul roads to avoid sensitive areas such as protected land and water bodies.	L
	Surface water and Ground water	Carbonaceous material and contaminated soils can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads and access haulage roads. Runoff from untreated/ unattended hydro-carbon spills areas my cause contamination and deterioration in the surface and ground water quality.	M	• All identified hydrocarbon spills to be contained and soils removed by trained stuff or appointed consultancy. • Recommendation from the storm water management plan to be implemented to prevent contamination on surface and ground water. This will include the construction of berms, dirty water trenches, clean water trenches and stockpiles to shield any surface and ground water from mining activities.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Air quality	Roads construction activities may cause dust that may influence the quality of air. Construction vehicles and machines can lead to the deterioration in air quality.	M	• Dust depressing methods to be implemented while construction of the access roads and haul roads take place. Water bowsers to be used to make sure dust impact is minimized.	L
	Noise levels	Construction activities may cause an increase in noise levels.	M	• Proper maintenance of all vehicles and equipment's to be undertaken on a regular basis to prevent excessive noise.	L
Stripping and stockpiling of topsoil	Topsoil's	Topsoil will be stripped and stockpiled; this action may cause contamination and deterioration in soil quality. There is a potential of mixing of topsoil's. Soil negative impact will occur due to the presence of vehicles and equipment's leading to hydrocarbon spills which may cause soil contamination.	M	• Topsoil and subsoil to be stockpiled separately and recorded accordingly. • A limited height of 2.5m is advised for all stockpiles to prevent any potential seeds and regrowth potential. • Contaminated topsoil's to be removed and transported for treatment. • Drip trays to be used for vehicles and equipment's (Drill rigs) that stand overnight.	L
	Vegetation	Vegetation will be removed during the stripping of the topsoil and will also be affected during the stockpiling process.	L	• Only vegetation directly in the path of the proposed access roads and haul roads to be removed with exception of any protected area. • Removal and stockpiling of all topsoil's to be used in final rehabilitation.	L
	Land capability	Stripping and stockpiling of topsoil will put the original land capability on hold until rehabilitation takes place.	L	• During the final rehabilitation stage, land capability to be restored completely to arable land.	L
	Land use	Topsoil stripping will result in the current possible land use to cease completely.	M	• Land use currently is agricultural orientated. Rehabilitation plan has post mining land use.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Surface and ground water	Carbonaceous material and contaminated soils can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads and access haulage roads. Runoff from untreated/ unattended hydro-carbon spills areas my cause contamination and deterioration in the surface and ground water quality.	M	• All identified hydrocarbon spills to be contained and soils removed by trained stuff or appointed consultancy. • Recommendation from the storm water management plan to be implemented to prevent contamination on surface and ground water. This will include the construction of berms, dirty water trenches, clean water trenches and stockpiles to shield any surface and ground water from mining activities.	L
	Air quality	Stripping and stockpiling of topsoil may cause dust due to vehicle movement that will influence the quality of air. Material handling (topsoil) will generate dust and this and vehicle emissions can potentially cause deterioration in air quality.	M	• Dust depressing methods to be implemented while construction of the access roads and haul roads take place. • Water cars to be used to make sure dust impact are minimized. • Material handling has to be limited to as little as possible to prevent the generation of dust.	L
	Noise levels	Stripping and stockpiling activities may cause an increase in noise levels.	M	• The construction of the stockpiles will limit noise beyond the mine. • Proper maintenance of all vehicles and equipment's to be undertaken on a regular basis to prevent excessive noise.	
Construction of the pollution control dam (PCD) and sewage treatment plant(STP)	Soils	Topsoil will be stripped as part of clearing the PCD AND STP positions and this may sewage treatment plant. This may cause contamination and deterioration in soil quality.	M	• Soils to be carefully stripped in layers and each layer stockpiled separately. • All notices or identifies spills to be attended or cleared • Application of drip trays for overnight storage of vehicles and equipment's.	L
	Vegetation	Vegetation will be removed from the dam footprint area as well as where the cut off drains will be located.	M	• Peg position of pollution control dam and water management infrastructure.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				• Infrastructure area to be located on cultivated land.	
	Land capability	During the construction and operation of the pollution control dam and water management infrastructure the original land capability classified as agricultural to cease completely. Note that these measures will remain post closure and will be of a permanent nature.	M	• Limit the area of the PCD and STP vegetation clearance to a minimum	L
	Land use	Construction of the water management measures and pollution control dam will result in the current possible land use to cease completely.	M	• Rehabilitate area back to arable land	L
	Surface water	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of these facilities. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality. Blasting of surfaces, footprint clearance on the sites of the proposed processing plant and other infrastructure, and other excavations in the mining area are likely to lead to increased sediments in runoff water.	H	• Construction of cut off drains • Encourage vegetation of topsoil and subsoil stockpiles • Design all blasts by a professional and use electronic blasting techniques to limit the impact as far as possible.	M
	Surface quality water	The transport, handling and storage of fuels, chemicals, construction materials and waste could lead to spills that contaminate soil surfaces and water resources.	M	• Waste must be discarded in an approved manner • Fuel and oil storage areas should be bunded • Spills should be cleaned up immediately.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Air quality	Material handling during the construction of the pollution control dam, sewage treatment facilities and surface water management structures will generate dust and this and vehicle emissions can potentially cause deterioration in air quality.	M	• Ensure that vehicles are maintained • Implement dust depression • Monitoring of fallout dust on a monthly basis	L
	Noise levels	Stripping and stockpiling activities may cause an increase in noise levels.	M	• The construction of the stockpiles will limit noise beyond the mine • Underground mining has limited noise • Proper maintenance of all vehicles and equipment's to be undertaken on a regular basis to prevent excessive noise.	L
Erection of shaft and associated conveyor route Construction from the Graspan mine to Nearest Rail-siding and power station	Soils	During handling activities of overburden and topsoil there will be spillages which will cause a deterioration and contamination of soils.	M	• Soils removed or excavated from the SHAFT areas should be stockpiled on different stockpiles based on soil horizons and soil types • Spills will be cleared and remediated immediately.	L
	Vegetation	• Vegetation along the path of development will be removed. These will not contribute significantly to direct habitat loss due to the local scale. • The change in land use is mainly related to existing transformed areas, namely cultivated land. • This impact will continue during the construction and operational phases (Surface clearing).	M	• Ensure availability of topsoil and subsoil are not sterilised for rehabilitation purposes. • Concurrent rehabilitation to be implemented on opencast operation to ensure topsoil is replaced as soon as possible. • Vegetation should be supported by fertilizer and proper watering to establish on the stockpiles of topsoil and subsoil's to control potential erosion. • Avoidance of protected areas and sensitive habitats during the site selection process. • Removal of vegetation should be restricted to the infrastructure path only.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Land capability	Stripping and stockpiling of topsoil will result in the original land capability to cease completely until rehabilitation takes place.	M	• Land capability to be restored in the rehabilitation phase of the project.	L
	Land use	Topsoil stripping will result in the current possible land use to cease completely.	M	• Land use currently is agricultural orientated. Rehabilitation plan has post mining land use.	L
	Surface water	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of these facilities. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality. Blasting of surfaces, footprint clearance on the sites of the proposed processing plant and other infrastructure, and other excavations in the mining area are likely to lead to increased sediments in runoff water.	H	• Construction of cut off drains • Encourage vegetation of topsoil and subsoil stockpiles • Design all blasts by a professional and use electronic blasting techniques to limit the impact as far as possible.	L
	Air quality	Construction activities may cause dust due to equipment movement that will influence the air quality. Material handling (shaft material) will generate dust and vehicle emissions can potentially cause deterioration in air quality.	M	• Dust suppression methods to be implemented, by means of water bowsers. • The active working area to be sprayed continuously to limit dust.	L
	Noise level	Shaft development activities may cause an increase in noise levels. Boring of the shafts and construction of ramp material add to the level of noise to people and animals within 500m area.	M	• Machinery to be retrain. • Place seismographs in specific surrounding areas to monitor vibrations and noise levels.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Heritage structures	Construction activities have the potential to impact already identified historical structures and graves on site.	H	• Marked graves situated in mine area must be avoided or an application for relocating the graves must be lodged. • Any activity that can commence 100m close to the area of the graves has to be applied for.	M
	Surface water	During the construction phase topsoil will be stripped and civil works will be underta ken in the form of earthworks and terracin g as part of the preparation of the area for the construction of infrastructure such as r oads, changing house, wash bays, offices, workshops, crushers, water treatment plan ts, sewage treatment plants, etc., including the conveyor.Construction equipment will be mobile on site.	M	• Construction will be limited to the project path. • "No-go" zones such as pans will be delineated for contractor's camp. • Appropriate storm water management measures will be implemented, including the temporary diversion of upstream run-off from the construction and laydown areas. • Surface water management measures, such as storm water canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained.	L
	Groundwater	**Ingress of groundwater into incline shaft void** The void in the incline will lead to an ingress of groundwater into the shaft. This will potentially result into movement of water from surrounding underground aquifers. This will manifest as a groundwater cone of depression in the water table with negative consequences of the availability of groundwater for existing borehole (Farm windmills) users around the proposed shafts.	M	• Inclined shaft is made with shotcrete/gunite walls which will allow groundwater levels to reduce and re-establish the cone of depression. • Provide affected borehole (Windmill) users with water available from underground and open cast working after treating the water. • The hydrocensus should be done annually, to confirm new boreholes (Windmill) users', changes in the borehole user yield and water of quality.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Groundwater	**Contamination of groundwater caused by spillage** Contamination and deterioration of groundwater quality may occur from the infiltration including hydrocarbons, chemicals and carbonaceous material affecting surface water from the Shaft areas into the adjacent aquifers.	M	• Spill specialist consultancy must be appointed. • The appointed specialist must implement a plan for all possible areas of leaks/spillages. • Monthly groundwater monitoring from existing and proposed monitoring boreholes will be undertaken to identify any potential contamination of groundwater resources. • Should contamination be identified, the source of the contaminants will be identified and the applicable remediation measures will be implemented.	L
	Groundwater	• The possibility of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden (Carbonaceous material with pyrite or acid generating potential minerals). • The potential impact of seepage water into the shallow weathered aquifer from the overburden stockpile is considered to be moderate. Potential contaminants may seep into the groundwater and could impact on the groundwater usage, which includes domestic and agricultural use. • Generally, overburden are considered as less acid generating potential materials, therefore does not have a great potential for AMD. However, during the removal of the overburden in the construction of the incline shaft, there is the potential to remove some of the uneconomical coal seams. The AMD potential of the overburden	M	• Conduct a proper study to verify AMD generation potential of the overburden only through sampling and analyses of core samples from the incline shaft location. • Place the overburden on a properly prepared and well-engineered slab. • A civil engineering design for PCD, Septic Tanks, leachate control and storm water management must be undertaken and submitted to DWS for approval.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		stockpile is considered moderate in the long term as the overburden will be stockpiled for the Life of Mine (LoM). The impact will be limited to the site.			
Construction of Infrastructure area, overland conveyor and ventilation shafts	Air quality	**Site clearing, removal of topsoil and vegetation** • During land clearing; topsoil removal, loading of material, hauling, grading, stockpiling, bulldozing and compaction are very common. Normally, topsoil and subsoil will be removed first with large scrapers. The topsoil will be stockpiled for final rehabilitation around the infrastructure area. It is anticipated that each of the above mentioned operations will have its own duration and potential for dust generation. • Fugitive dust will give rise to nuisance impacts as fallout dust and give rise to health impacts. It is anticipated that the extent of dust emissions would from day to day depending on the level of activity, the specific operations, and the prevailing meteorological conditions. • This activity will be short-term and localised, seizing after construction activities. Material will be removed by using a bulldozer and then storing this material separately for use during final rehabilitation at end of LoM when the operation cease. These construction	L	• Topsoil should not be removed during windy seasons due to associated wind erosion heightening dust levels in the atmosphere. • Clearing of vegetation must be restricted to constructing only. • During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised. • Water or other binding agents such as (water bowsers) with extended sprays can be used for dust suppression on earth roads. • Minimum travel speed of 30km/h distance and volume of traffic on the roads to be used for bulldozers and graders. • Stockpiles should not be left for prolonged periods as wind energy generates erosion and causes more dust to form. . • Constricting the areas and time of exposure of pre-strip clearing in advance of mining development	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		sites are ideal for dust suppression measures as land disturbance from clearing and excavation generates a large amount of soil disturbance and open space for wind to pick up dust particles and deposit it elsewhere (wind erosion). Issues with dust can also arise during the transportation of the extracted material, usually by truck and shovel methods, to the stock piles. The dust can further be created by the entrainment from the vehicle itself or due to dust blown from the back of the bin of the trucks during transportation of material to and from stockpiles.			
	Air quality	• Construction of access roads, pipes, storm water diversion berms, change houses, admin blocks, drilling, drilling blasting and development of box cut and decline shaft for mining, etc are the source of dust emission. • Activities of vehicles on access roads, levelling and compacting of surfaces, as well localised drilling and blasting will have implications on ambient air quality. The above-mentioned activities will generate dust containing TSP (total suspended particulate, giving rise to nuisance impacts as fallout dust). Underground mining will commence with the development of the incline shaft and stripping of the vegetation for the initial boxcut.	M	• The use of water bowsers will reduce dust emitted during bulldozing activity. • Material need to be removed to dedicated stockpiles to be used during rehabilitation. • Haulage of materials should take place on roads which are being watered and/or sprayed with dust suppressant (Bowsers). • To reduce the amount of dust being blown from the load bin in the haul roads, the material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers. • Constricting the areas and time of exposure of pre-strip clearing in advance of construction to limit exposed soil surfaces.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Topsoil and overburden need to be removed and stockpiled separately by means of truck and shovel methods (front end loaders, excavators and haul trucks). Once the rock has been reached will blasting be required to further remove material to the point where the mineral can be extracted. Bulldozing, excavation, drilling and blasting operations will result in the emission of dust to atmosphere. • The construction of roads takes place through removing the topsoil and then grading. • Temporary beams will be created close to the edge of the haulage road in order to be backfilled easily once the haulage road has fulfilled its purpose will be rehabilitated.			
	Air quality	**General transportation, hauling and vehicle movement on site** • Shift changes and transportation of the workers and materials in and out of mine site will be a constant feature during the construction phase. This will however result in the production of fugitive dust due to suspension of friable materials from earth roads. • It is anticipated this activity will be short-term and localised during construction phase activities are finalised but will continue.	M	• Hauling of materials and transportation should take place on roads which is being watered and/or sprayed with dust suppressant. • Material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers. • In order to mitigate the impacts of the activity, the speed limit should be kept to (30-40km/h) as more dust will be generated at higher wind speeds. • Speed limits need to be observed and form part of the golden rules. • Application of wetting agents or application of dust suppressant to bind soil surfaces to avoid soil erosion.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Haul trucks generate most dust emissions from surface operations which reduce or create poor visibility.		• The drop heights should be minimised when depositing materials to the ground.	
Construction of infrastructure area, overland conveyor and ventilation shafts	Noise	**General rise in ambient noise levels** Noise levels are expected to increase during construction phase directly to affected adjacent community of the proposed shaft complexes and the conveyor route.	M	• Improved Communication between the community and the mine development team need to be implemented and maintained, highlighting the outcome of this study. The developer should consider co-ordinate the working time with periods when the community are likely not at home. An example would be to work within the 8 am to 2 pm time-slot to minimise the significance of the impact due to: • Potentially community are most likely at school or at work, minimizing the probability of an impact happening; and • Normal daily activities will generate other noises that would most likely mask construction noises, minimizing the probability of an impact happening. Ensure a good working relationship between the project representative and all potentially sensitive community/receptors. Communication channels should be established to ensure prior notice to the sensitive receptor if work is to take place close to them. Information that should be provided to the potentially sensitive receptor(s) include: • Generally construction activities should not take place before 8am and after 5pm and not on Sundays and public holidays. This would however not always be realistic, as deadlines and specific construction activities could take 12+ hours.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				• How long the activity is anticipated to take place; • What is being done, or why the activity is taking place; • Contact details of a responsible person where any complaints can be lodged should there be an issue of concern. • If blasting is required to take place near a community (within 500m), the developer must implement recommendations from Vibration & Blasting Specialist study.	
	Noise	• Noise impact that would only occur in the operational phase. • Noise level can be controlled by means of berms and shielding structures.	H	• The underground ventilation must not face any Communities or farm dwells that are within 750m. The buffer of 750m must be clearly marked and maintained. • It is highly recommended that the shaft is not facing upwards (skywards). Certain metrological conditions (particularly during night-times) can see refraction of noise over the wall due to the various temperature inversion layers. This means that noise levels from the source may propagate back down to the ground at a receptors dwelling due to the curvature of sound in the warmer upper night-time atmosphere. Placing the ventilation shaft upwards may allow for this propagation. • A stack silencer should be implemented (e.g. a stack silencer liner inside the stack). • A berm/acoustical barrier need to be implemented around the ventilation stack. Berms on the edge of the stockpiles should be implemented (ensuring the height is higher than the highest noise source on the stockpile).	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Heritage	There are several marked graves located within the mining right area that will be affected during the construction and operation phase.	H	• Infrastructure needs to be developed at 100m buffers away from the grave site. • All graves within the surface operations and the path of any construction will need to be relocated according to all stipulations of the National Heritage Resources Act.	L
	Biodiversity	**Loss of species of conservation concern** • Construction activities in or near wetland (Pans) habitat will result in permanent removal of habitat considered to be of increased ecological importance and sensitivity, and there is a significant risk that construction activities may affect natural habitat adjacent to the cleared areas, especially the wetlands. • Influx of personnel, especially during the construction phase, faunal species will be more likely to collide with vehicles. • The possibility of fire within the study area will also increase ore especially in dry seasons which will have negative impact on final biodiversity and habitants. • Avi-Fauna species can collide with erected structures such as inclined and ventilation shafts.	M	• On the underground section, no clearing of vegetation will occur. • Clearance of vegetation will be limited to the surface mining part which is the small portion of the mining right application. • Mining activities should be restricted to the proposed mining activity layout. • Occurrence of alien species should be monitored on site and once identified should be cleared, as disturbance in natural habitat and compaction of soil usually leads to the establishment of alien plant species. • Sensitive areas such as wetlands (Pans) and drainage lines should avoided and any plan to operate within wetlands must be authorised by DWS. • Minimising the destruction of or disturbance to vegetation within the proposed area of activity, as well as in the surrounding areas; • Preventing the unnecessary destruction of any natural habitat and animal life within the boundaries of the proposed area of development and adjacent area such as hunting, killing of snakes' etc.	L
General construction of		As a result of general construction of the mine, buildings and other mine related	PL	• Procurement of suppliers must be as per the approved SLP.	MP

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
mining project to operational phase at Graspan Mine.	Socio-Economic Local Economic Impacts	infrastructure, procumbent opportunities will be created that could benefit local suppliers.		• Conduct a local skills assessment and update quarterly or annually to ascertain what skills are available that may meet supply chain requirements. • Proper or improved Communication with local suppliers to register on the suppliers list to manage expectations.	
		Impacts on local employment Approximately 250 of temporary and permanent employment opportunities will manifest over mine period. Employment will relate to site clearing, fencing, civil works, underground wall construction, the conveyor installation, etc.	H	• Communicate available opportunities though local newspapers, mine notice bard and liaising with the community representatives and including recognised community forums. • Enforce employment/procurement policies and procedures (e.g. do not employ at the mine gate) to prevent unnecessary influx by jobseekers. • On-going consultation with the stakeholders must be made with regards to the start date of the mine Project to prevent early or long-term influx. • Address concerns with and ensure local job and procurement opportunities. • Ensure compliance with socio-economic tools and legal requirements (BBBEE and Mining Charter).	H
		Impacts on local economy • Positive impacts for the local economy during the construction phase may occur • It could be expected that most construction material requirements will be sourced from industries in Hendrina and a positive impact for the local Municipal economies could thus	H	• Reduction of unemployment rate. • Issue Contracts SMMEs and local service providers. • Source Local procurement of material and goods, where possible. • Positive impacts for the retail market (groceries, goods and services, food suppliers, etc.) for local merchants, shops and informal traders; and	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		be expected together with the uplift of SMME's.		• Boost accommodation facilities for temporary skilled employees in local establishments and its associated spin-offs. • It is recommended that a Social Steering Committee be established to implement the objectives of the CSMP and to address socio-economic development issues in a more structured manner. • Contractor Social Management Plan (CSMP) to be in place and implementation of its requirements for the duration of the construction period to: • Ensure proper and constant communication between the various sectors that deal with 'social' issues, such as Human Resources (employment), Supply Chain (contractors), Corporate Affairs (communities). • Address concerns timeously, ensure local job and procurement opportunities; and • Ensure compliance with national legal requirements (BBBEE and Mining Charter). • As part of the tender documents the contractor has to provide subcontracting values per package and the plan on how he will meet BEE procurement and SMMEs targets assigned. • Implement relevant measures should the contractors not comply with the social management plan they submitted (impose penalties, termination where necessary, review of future prospective work and so forth). • Erect signboards along the affected routes that display the contactors name, contract description and construction period.	

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Socio-Economic Impact Population impacts	**Ingress of jobseekers** Unemployment levels in the study area are a concern. Although limited (approximately 250 temporary and permanent employment opportunities) the prospect of employment during the construction phase is likely to attract jobseekers from the broader local municipal area and even the district and can affect locals and the Municipality in the following ways: • An increase in local unemployment levels should the jobseekers outnumber demand for employment. It is possible that many of the jobseekers will remain in the area after the construction period; • South Africa is well known for xenophobic attacks which will lead to potential conflict between locals and "outsiders" that creates employment opportunities and other resources. • Rise in the number and size of informal settlements which is currently not the case in the proposed study area. • A potential increase in crime in the direct vicinity of the study. • Additional pressure on local government to provide housing, employment and so forth should job seekers remain post-construction. • The establishment of informal areas are often also a consequence of non-	L	• Approved SLP must not create unrealistic expectations and communicate accurate details of the construction period to the local communities. Establish a labour desk and ensure that the local Councillor(s) are involved. • Involve the Local Councillor(s) amongst many involve Mr Blose to ensure that they convey the information to the local communities through their established means of communication. • Set guidelines in the CSMP for local employment and ensure implementation thereof for the duration of the construction period. • The provision of accommodation for contractors and the erection of a construction camp are not allowed on site. • Employees and contractors to be housed in the nearest towns such as Hendrina, Davel and Ermelo.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		local contractors and sub-contractors that want to live near their places of employment. The prevention of an influx of jobseekers/contractors and the subsequent establishment of informal settlements near employment opportunities are always a concern and challenge.			
	Socio-Economic Impact Population impacts	**Impacts on the size and structure of the population** Although employment opportunities for this project will be limited, unrealistic employment expectations could result in the uncontrolled influx of jobseekers and migrants, specifically males (followed by family members), with negative consequences for locals and local government. As large-scale influx of construction workers are not anticipated, it is unlikely that the age, gender or racial structure of the local or wider municipal area will be impacted significantly during the construction phase.	L	• Involve the Local Councillor(s), community forum and other recognized stakeholders in the process to ensure that they convey the information to the local communities through their established means of communication (community meetings, etc.). • Set guidelines in the CSMP for local employment and ensure implementation thereof for the duration of the construction period. • The provision of accommodation for contractors and the erection of a construction camp are not allowed on site. Employees and contractors to be housed in the nearest towns such as Hendrina, Davel and Ermelo.	L
	Socio-Economic Impact Individual and family level impacts	**Disruptions in daily living and movement patterns** Disruptions in daily living and movement patterns for surrounding communities, land owners and road users could manifest in the form of traffic and intrusion impacts resulting in short-term disruptions and safety hazards. Road R38 closer to mining area and gravel route traverses the mining area. Additional factors that could impact	M	• Announce disruptions, road closures (if any) and so forth by using the local media, road sign boards and other Municipal structures and collaborate with the Local Municipality in this regard. • Erect signboards indicating accesses to the construction site and detour. • Fence off the development footprint of the proposed construction site prior to the	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		negatively on daily living and movement patterns include; The available gravel route will be applied for relocation with Sanral. The process of relocation will increase in accidents, frustrated motorists and financial implications for local and provincial government (road repairs), temporary road closures (if any), construction vehicles that offload materials on site (dust, noise, etc.), and dust generated on access and haul roads resulting in impacts for residents, farm houses, crops and livestock.		commencement of site clearing and construction activities. • Make golden rules or Impose penalties for reckless drivers to enforce compliance to traffic rules. • Inspect trucks and other heavy vehicles on a regular basis and ensure proper maintenance to avoid oil spillages and un-roadworthy vehicles that could lead to accidents. • Fence off the development footprint of the proposed construction site prior to the commencement of site clearing and construction activities. • Display a contact number on the construction vehicles where motorists can report reckless driving. • The mine to consult with adjacent landowners whose private residences, crops, livestock and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement. Provide a schedule of the construction activities to landowners and relevant I&APs. • Keep the local SAPS in Davel and Ward Councillors informed about the construction progress and timelines to ensure that they would be able to adequately deal with any type of disruptive behaviour or theft.	
	Socio-Economic Impact Individual and	**Security impacts** Criminal activities increase in areas where construction projects take place. An influx of “outsiders” (jobseekers and contractors) and the potential increase in the	L	• Provide workers with identity tags and prohibit the access of unauthorized people to the construction site. • Visitors to report to security guards or security officer’s prior entrance.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	family level impacts	unemployed and the establishment/growth in informal settlements could exacerbate security issues. Employment of locals and strict implementation of the guidelines set in the CSMP during the entire construction phase will minimise potential security impacts.		• Workers should not be allowed to remain in the construction area when they are off duty and have any social visits during working hours. • Implement safety and security measures, such as fencing, 24-hour security guards, CCTV cameras, random security checks and access control.	
		Impacts on road infrastructure An increase in the size and frequency of large construction vehicles and trucks could potentially damage already deteriorating local road surface.	L	• Communicate with the local Municipality with regards to potholes and possible repairs to the road surfaces that might be required and also engage with the counsellor to see where in terms of the planned SLP, the mine can assist.	L
		Disruptions of services (water/electricity/sewerage) No impacts and disruptions on services such as water, electricity provision and sewerage are anticipated as a result of the construction phase.	L	• Inform surrounding landowners and other affected parties in advance and have an agreement in terms of the use of water from windmills and located boreholes. • Adhere to all approved water uses requirements. • Ensure that surrounding landowners and residents are aware of procedures to raise complaints and make the contact numbers of the Main Contractor available to them, should issues arise.	L
	Socio-Economic Impact Health and safety impacts	**Health and safety risks for workers** • Inadequate management of the construction process and general construction related activities could result in health and safety risks for workers, manifesting in the following ways:	H	• Enforce the use of PPE where relevant. • Store dangerous plant, equipment and material away from reach when not supervised or in use. • Dispose of the various types of waste generated in the appropriate manner at licensed waste fill sites at regular intervals.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Construction-related accidents due to structural safety of project infrastructure. The excavation of the shaft will result in the formation of dust, which may be a safety risk to the employees, livestock and neighbouring landowners. • Dust generation and air pollution resulting in respiratory diseases. • High noise levels caused by machinery and construction equipment resulting in health issues for workers. • Poor management of the construction process resulting in pollution problems (e.g. insufficient funds, facilities, littering and refuse) flies, rodents and pests and possible contamination of drinking water. • Unsafe and insufficient drinking water • An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women, unwanted pregnancies that place further pressure on basic healthcare services. • An increase in several abortions • Dehydration and sunburn which will results to heatstroke, as high temperatures can be experienced during summer months.		• Provide safe and clean drinking water and instil regular fatigue breaks to keep workers hydrated. • Provide enough ablution facilities (chemical/portable toilets, etc.) at strategic locations that are cleaned regularly. • Keep the local police and ambulance services informed of construction times and progress. • Ensure that the mine has an ambulance that remains on stand-by for the duration of the project. • Store any materials away from sensitive locations in fenced-off areas • Accommodation and facilities of security guards and any other personnel that may stay on site should comply with health and safety regulations. • Train employees and contractor on how to handle dangerous substance on site and to understand the material safety datasheet. • Inform the Municipality and emergency services if harmful substances are spilled. • Erect a safety fence around the shaft complex and construct relevant reinforcements to ensure slope stability. • Erect or put barricaders to restrict access in construction area. • Utilise and increase existing mine security and procedures and 24-hour security in and around the mining area. • Fence off the construction site where possible to avoid illegal trespassing. Close off any excavation areas to prevent access.	

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				• Implement measures to suppress dust - spraying of gravel roads, surfaces and stockpiles with water on a regular basis. • Construction workers to wear protective clothing (e.g. Full PPE) that minimise dust inhalation and clothing that protect against sunburn.	
	Socio-Economic Impact Health and safety impacts	**Community health and safety** • Farm Residents, surrounding landowners and road users could be subject to community health and safety impacts if the construction process is not managed adequately. This could include: • Road accidents, subsequently placing pressure on local disaster management and health services (fire, ambulance, police services, etc.). • Unauthorised access/trespassing at the construction site resulting in theft, public safety issues and even death. • Fire hazards at the construction site and the possibility of spreading and damaging surrounding farmland and infrastructure. • Machinery resulting in respiratory diseases.	H	• Identifiable tags and clothing for construction workers (PPE) and the implementation of security measures at the entrance to the construction site. • Display “danger” warning signs and “no public access” signs at all potential accesses and paths. • Adhere to the Emergency and Safety plan procedures for the duration of the construction phase. • Make the procedure to lodge complaints available to the surrounding property owners and Ward Councillors to enable them to lodge complaints when problems with regards to community and/or environmental health arise. • Heavy vehicles to keep headlights and strobe lights/protection lights always switched on to improve visibility. • Inspect vehicles on a regular basis and impose penalties for reckless driving. • Ensure good visibility at the accesses to the site by watering making use of bowsers.	M

16.16 Impact Assessment for the Operational phase

Table 36: Impacts and proposed mitigation measures of activities in the operational phase of the project

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
Operation of shafts, conveyor belt and Infrastructure area containing stockpile areas.	Soils	During operation of the mine, it is anticipated that carbonaceous material (e.g pyrite host materials or acid generating minerals) may be spilled which will contaminate soils. Contamination by dirty water run-off and/or spillage of hydrocarbons and/or chemicals is also expected from operations vehicles and machinery.	M	• All spills to be cleaned immediately after such an event. • Appoint a specialist to develop a hydrocarbon spill procedure for all possible areas of spillages. • Spill kits to be freely and readily available. • All vehicles to be parked and serviced in and on a bunded area, which is included in the Storm Water Management system. • All storage and service areas of vehicles to drain into a sump with an oil separator.	L
	Soils	Deterioration of topsoil quality due to salt contamination at the coal stockpile and crushing and screening plant area.	M	• Structures that involve coalliferous material should have a compacted base layer which serves as a sealing layer to prevent contaminated water from seeping into the ground water system. • Proper runoff control structures should be in place which channels all polluted water into a pollution control facility.	L
	Land capability	Complete cease in land capability at the footprints of all structures that covers the surface during the operational phase.	L	• No mitigation of loss in land capability is possible during the construction and operational phase because the land capability will remain ceased as long the structures covers the surface.	L
	Land use	Stockpiling of overburden will result in the current possible land use (agriculture) to cease completely in an area covered by surface mining operations.	L	• Rehabilitate as soon as possible and create a land use of agriculture although the land capability will be arable.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Surface water	Loose material as well as the contaminated overburden material can contaminate surface water during rainfall events resulting in dirty water runoff. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	L	• Clean and dirty water trenches separation measures such as trenches will be constructed around the stockpile area to separate the dirty areas from the clean areas. • The contaminated water will be collected and diverted via a pipeline to the pollution control dam. • Ensure that spills are cleaned up immediately to avoid surface water contact and contamination. • Implementation of the Storm Water Management Plan (SWMP) as per water use.	L
	Surface water	Impacts associated with the incline shaft area would be as a result of runoff entering the underground workings and coming in contact with carbonaceous material. Impacts may arise from: Contaminated storm water runoff, as well as wash down water and hydrocarbon spills that discharge from the site more especially coming from product stockpiles or processed coal, which will result to deterioration of water quality, associated with increased suspended solids, hydrocarbons (oils and greases), siltation of carbonaceous materials, increase in salinity and potential decrease in pH in the watercourses. Erosion at the clean canal discharge points could result in the formation of erosion gullies on surface, with elevated suspended solids in the runoff water, potentially impacting on the water quality in the watercourses in	H	• All facilities with the potential to generate dirty storm water runoff will be trenched around to divert water to the PCD. • Clean runoff will be diverted around the designated dirty areas by means of clean water trenches, sized to accommodate at least the 1:50 year peak flow event. • Adequate erosion protection will be provided at clean water trenches. • All spills will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, filling stations etc.). • Both general and hazardous wastes will be stored in skip bin until removed from the site. The skip bin in turn will be located under in bunded areas. • There will be capacity to store a maximum of approximately 132m^3 of general waste in waste bins during the life of the project. • The storage period will be less than 30 days before removal from the site by an appropriately licensed waste removal contractor and disposed of at a licensed general waste facility. • Hazardous waste will be stored according to the applicable regulations under the National	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		terms of suspended solids and deposition of silt.		Environmental Management: Waste Act (Act 59 of 2008) and the DWS Minimum Requirements. • The waste storage area will, as a minimum, be paved with concrete or provided with n approved liner, covered and provided with bunds and drainage facilities to collect and contain any spills or adversely affected runoff and the drainage will be connected to the return water dam. • Waste oil will be stored in drums in a bunded storage area. • Oil collector or Specialist Company will be appointment to recycle the oil for the purpose of reuse. • Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil more especially in the filling station area and workshop area. • All contaminated runoff and spills that escape bunded areas will be collected and contained in the PCD. • All pipeline routes will be inspected regularly to enable early detection of leaks. • All dirty storm water and wash down water will be collected in the PCD. • Spill-sorb or a similar type product must be kept on site and used to clean up hydrocarbon spills in the event that they should occur. • A surface water quality monitoring programme will be implemented to detect any impacts.	
	Groundwater	Seepage from the overburden stockpile can contaminate the groundwater immediately below the stockpile as well as adjacent areas.	H	• Ensure that the trenches are established and that any surface seepage be contained and diverted to the pollution control dam (PCD). • Implementation of the SWMP and IWWMP	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Air quality	Dust will be generated due to vehicle and machinery movement.		• Conduct dust suppression using Bowsers.	L
	Air quality	**Use and maintenance of access roads** Transportation of the workers and materials in and out of mine site will be a constant feature during the operational phase. This will however result in the production of fugitive dust due to suspension of friable materials from earth roads. It is anticipated this activity will be long-term and regional and will seize once the life of mine has been reached. Substantial secondary emissions may be emitted from material moved out from the site during grading and deposited adjacent to roads. Passing traffic can thus loosen and re-suspend the deposited material again into the air.	L	• Planting plenty of trees or hedges as shelterbelts/windbreaks to eliminate or minimise wind disturbance. • Planning operations to maximise the benefit of wind breaks • Disturbed areas such as those caused by stripping off grass and topsoil should be kept to a minimum. • Roads and standing(Picking points) areas should be sealed or concreted where possible • Use water sprays with bowsers to settle dust. Care must be taken to ensure that the water used is free from pollution by noxious matter. There are additives available that reduce the volume of water used, and increase its effectiveness, but approval to use them should be obtained DWS. • Use of a global positioning system (GPS) as a tool to track the locations of mining and dust suppression equipment (e.g. water carts) and cross-referencing this information with real-time weather monitoring to assist with dust control. • Use of water sprays (Bowsers) at each contact or transfer point along the conveyance system which have adjustable rates of application depending on dust levels. • Automatic water sprays installed at the ROM hopper bin that produce a fine mist to suppress dust generated with the triggering of sensors when a truck enters the dump zone and automatic sprays activated until a set time following the departure of the truck. • Use of a reclaim tunnel at the product stockpile and an enclosed conveyor to transfer minerals to	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				the loader, both of which minimise dust generation. • Use of a retractable telescopic chute with curtains to load minerals into transport trucks • Speed restrictions should be imposed and enforced • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust. • Exhaust pipes of vehicles should be directed sideways so that they do not raise dust. • Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust.	
	Air quality	**Dust from material handling** Handling of coal and crushed coal are potential sources of dust emissions at the various handling stations. Handling stations include the conveyor transfer points and the loading of the conveyors. Various climatic parameters e.g. Wind speed and precipitation influence the amount dust generated from material handling operations. The volume of material being moved and height that the material is dropped at also influence the dust generation at the various handling points. Dust can influence adjacent roads and households/ farm dwellers.	H	• Water sprays at the material handling points • Covered conveyor transfer points. • Material wetting before being transferred. • Traffic control by restricting vehicle speed limits. • Implementation of a dust monitoring programme.	M
	Air quality	**Windblown dust from conveyor**		• Dust suppression spraying of transfer points. • Install wind barriers on upwind side of the conveyor.	

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		Wind can blow coal dust from the conveyor between the mine and the nearest rail-siding.		• Plant windbreaks around the mine area. • Cover the conveyor in the direction of the predominant wind direction.	
	Noise	During the operational phase, increased noise levels can be expected especially on surface operations.	H	Proper and clear open communication between the communities and the developer need to be implemented and maintained. • Ensuring that equipment's are well maintained and fitted with the correct and appropriate noise abatement measures. Acoustical mufflers (or silencers) should be considered on equipment exhausts. A noise absorption braid could be mounted on the front of heavy equipment radiators (ADT's, FELs etc.) to prevent excess mechanical fan noise into the surrounding environment. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised.	M
	Visual	**Potential visual impact on the viewpoints that had a visual exposure rating of 5 or higher.** The operational impact on the surrounding agricultural farmers and land users will be more significant, due to the visual intrusion and activities being undertaken. Although the surface mining activities will be limited to a small area since underground mine activities will cover most of the area, the stockpiles, waste rock dumps and	M	• The visual impact can be minimized by the creation of a visual barrier more especially near the road. • The area will be rehabilitated after mining is concluded and thus the visual impact will be removed and the area will be restored.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		related surface infrastructure will be visible for the entire life of mine.			
	Groundwater	**Underground (Lowering of groundwater levels- boreholes)** The mining operation in the operational phase may draw down the water table, affecting boreholes of adjacent property owners (The two identified windmills).	H	• Monitor static groundwater levels on a monthly basis in all boreholes within a zone of two kilometre surrounding the mine to ensure that any deviation of the groundwater flow from the idealised predictions is detected in time and can be reacted on appropriately. • If it can be proven that the mine is indeed affecting the quantity of groundwater available to certain users, the affected parties should be compensated. This may be done through the installation of additional boreholes for water supply purposes, or an alternative water supply. • The numerical model should be updated during operation of the mine by using the measured inflows, water levels and drilling and pump test information to recalibrate and refine the impact prediction.	M
	Groundwater	**Underground (Lowering of groundwater levels- base flow to the Olifant's River)** The mining operation could potentially lower the baseflow of surrounding water to the Olifant's River.	M	• Groundwater monitoring boreholes should be installed to comply with DWS. • Monitor static groundwater levels on a monthly basis in all boreholes within a zone of two kilometre surrounding the mines to ensure that any deviation of the groundwater flow from the idealised predictions is detected in time and can be reached on appropriately. • If it is proven that dewatering of the mine is impacting on baseflow, various options should be investigated such as if clean discharge is available to be pumped back into the surrounding streams/rivers/wetlands. A surface water specialist should be consulted in this regard.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Groundwater	**Contamination during mining (sewage, oil spills and mine material)** Groundwater can become contaminated due to sewage spills, oil spills or mining material spills.	L	• Groundwater quality must be monitored on a monthly basis. • The monitoring results must be interpreted quarterly by a qualified hydrogeologist and the monitoring network should be audited annually to ensure compliance with regulations DWS. • The numerical groundwater model must be updated by calibrating the model with monitoring data. • Water retention dams should be lined to prevent ingress of contamination to the groundwater. • Geochemical testing of the backfill material and pillar material should be conducted to aid in the prediction of contaminant release and potential geochemical changes induced in the subsurface, by means of geochemical modelling. • Clean and dirty water trenches should be separated as planned. • It must be ensured that a credible company removes used oil after vehicle servicing. • A sufficient supply of absorbent fibre should be kept at the site to contain accidental spills • Store all potential sources in secure facilities with appropriate storm water management, ensuring contaminants are not released into the environment. • Sewage effluent emanating from latrines or ablution blocks should be treated to acceptable levels before discharge into the environment s required by DWS.	L
	Groundwater	**The formation of Acid Mine Drainage (AMD) in groundwater resources** The formation of the AMD could occur as a result of the ingress of water and	M	• Optimise dewatering from underground section water to minimise ingress to the underground aquifers.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		oxygen into strata containing sulphide minerals. Local patches of mine water in contact with only carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded these acidic parts will come within contact with the neutral-alkaline drainage from the silicate minerals.		• Develop a groundwater monitoring programme in order to assess the groundwater quality. Frequency of monitoring to take place as per the groundwater monitoring plan. • Should pollution be identified within the groundwater resources, the source of the pollutants will be identified, and the applicable remediation measures will be implemented.	
Operation of the surface mining (Boxcut)	Drilling and Blasting	**Blasting activities.** Blasting activities will result to: • Permanent alteration of geology • Possible contamination from hydrocarbons • Harm to possible surrounding fauna • Poor visibility, Dust creation, Air blast disturbances and Fly rock creation • Water contaminated • Groundwater contamination from contaminated water seepage • Noise • Fire hazards due to drilling	H	• Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow. • Ensure that machinery used is up to standard and no leakages exists • Hydrocarbon spillages must be cleaned immediately Contain any spillages by removing the affected soil surface and dispose at the designated waste bin to be disposes at a designated landfill site by service provider. • Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow Fauna of the surrounding area has already being affected by mining and agricultural activities within the property. • Blasting will only be employed if the coal is deep in the strata, however truck and shovel mining will be used to mine the coal since the level is considered shallow. Stakeholders will be notified of all blasting schedules if blasting is employed	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				• Site Environmental Control Officer and Mine Personnel will be informed and notified before any blasting operation • The should be reduced charge mass per delay and different initiation system must be tight to the drilling and charging mechanisms • Stemming control will be in place to avoid air blast and fly rock • Drilling and blasting where a pond of water exists from possible rain water will be avoided. If found, such water will be diverted to the relevant designated control dam • Operators will use safety PPE such as ear plugs and the activity will take place during the day. Stakeholders will be notified of all blasting schedules if blasting is employed • Fire extinguishers will always be available on the site.	
Operation of the Graspan Mine in general	Socio-Economic Impacts: Local economic impacts	**Employment at the mine.** The mine will employ and estimated 200 permanent employees, with skills levels that vary from skilled, semi-skilled to unskilled. Approximately 50 of the employees will be unskilled and illiterate and for all employees individual training and skills development plans will be implemented in alignment with career progression. Skilled employment will include managerial positions, Mine Planners, Environmental and other Specialists, Geologists, administrative and financial personnel, certain Operators,	M	• Targets 26% for the mining operation for BEE spend are set by the Department of Mineral Resources (DMR) in the Mining Charter. Implementation of the SCMP will ensure that local economic benefits are maximised and the social performance of Contractors (local employment, local procurement targets, skills development, etc.) are managed through the CSMP. • Should Contractors not comply with the social management plan that was submitted or the KPIs (breach of contract), the contract may be terminated. • Local employment is once again emphasised and workers that reside closest to the mining area should first be considered for employment.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		Engineers, Boilermakers and so forth. Semi-skilled positions relate to Foreman positions and Operators such as Diesel Attendants, whereas unskilled positions are usually associated with manual labour (underground miners, gardeners, etc.). It is anticipated that most of the positions could be filled by locals from the Municipal area as mining and industrial related skills should be available in Hendrina. Locals closer to the project site would likely expect to be considered especially for unskilled and semiskilled positions. Tertiary education levels in Ward 10 are much lower. In addition to permanent positions, temporary employment and contractors could be added. Temporary employment would include: • Cleaning and maintenance of the conveyor belts, the culverts • Cutting and clearing of vegetation within the used mine area • Maintenance of firebreaks • Maintenance of gravel roads, regular grading and watering to suppress dust • Repairing of fences as required • Repair and maintenance of buried and surface pipelines in the servitudes, various valves		• Community forums must work hand-in-hand with the mine during selection process. • Establish a labour desk in collaboration with the Ward Councillor and local Municipality to determine the skills that are available locally before considering “outsiders”.	

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Regular cleaning of silt traps drying bed, oil traps, dams, etc.			
	Socio-Economic Impacts: Local economic impacts	**Impacts on procurement / supporting industries / local SMMEs** The Mining Charter sets BEE compliance guidelines and as such Graspan mine will have to procure all products and/or services from BEE compliant outlets. In order to ensure and promote the procurement of products and/or services from SMMEs who are BEE's compliant as well as black owned and/or black empowered, strategies are identified in the Mine's SLP. It is expected that most goods and services will be available locally from within the Municipal area. Supporting industries, local SMMEs and contractors include: • Contractors to transport and dispose of domestic and industrial waste • Cleaning Services (truck, conveyors, belts) • Maintenance and repairs of infrastructure, road, etc. • Operation of tuck shops • Laundry and catering services • Gardening • Security, etc.	M	• Establish a labour desk in collaboration with the Community Forum, Ward Councillor and local Municipality to determine the skills that are available locally before considering "outsiders".	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Socio-Economic Impacts: Local economic impacts	**Impacts on current non-mining related employment levels of the area.** The proposed mine is surface that will transition to an underground operation and current land uses will to a large extent be unaffected as minimal extent on surface mining is applied for. However, should negative impacts usually associated with coal mining (impacts on water resources, air/dust pollution, crime, etc.) manifest and affect current land uses (farming) to such an extent that existing operations cease or are downscaled, then job losses would be inevitable. It was not at this stage possible to determine the existing employment numbers within the study area and the extent of potential job losses, should it occur, is not known.	M	• Appoint Groundwater specialist or company to implement the 'Groundwater Management Strategy' and any recommendation made as part of the Geohydrological Report. • Appoint consultancy to test boreholes on all affected private properties at regular intervals, make the results known to the property owners and keep record of test results by land owners, the mine operator and independent specialists and conduct quarterly meetings where issues relating to the environment and water pollution can be discussed.	L
	Socio-Economic Impacts: Local economic impacts	**Impacts on land values / market values of affected land portions** A variety of factors could impact land values of affected land portions and include: • The availability and quality of ground and or surface water for domestic and farming purposes • Intrusion impacts, such as noise and dust, which could have an impact on crops, livestock and infrastructure • Occurrence of criminal activities (theft, vandalism, etc.)	M	• The mine should contact property value surveys and compare it with the municipality property value evaluation. • The mine should improve the area by establishment things such as (building community clinics, Multipurpose status) and the mine should provide houses to low income earners as a way of fighting with poverty and inequality and crime. • Should boreholes be affected, implementing an Action Plan that will ensure that clean water (on-tap) is available to all the affected landowners without disruptions. • Ensure that all affected landowners are familiar with the procedure to lodge complaints and attend to the	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Occurrence of informal settlements, trespassing on private land, grazing practices, etc • Restrictions that are set by the mining company for future infrastructure developments on private properties due to underground mining operations, safety issues, and so forth.		issues at hand expediently. Update affected landowners of new developments and attempt to communicate with them directly by minimising the use of Consultants for this purpose. • Monitoring programmes for groundwater need to be implemented and if ground water quality or quantity is affected, water will need to be supplies by the mine for use by users affected. • Communication and further consultation to be initiated with surrounding landowners regarding the way forward. No commitments for indirect impacts can be made that is not already included in the mitigation strategies of environmental specialist reports such as visual, noise, air quality and ground water, and as adopted into the EMPr.	
	Socio-Economic Impacts: Skills development and social responsibility	**Skills development, training and skills equity** A 'Skills, training and development Policy and Plan' has been drawn up as part of the SLP with the purpose to provide guidelines for the implementation and maintenance of comprehensive training and development strategies and procedures. Funds for Human Resource Development for individual career development and in-service training are will be provided. Training includes ABET to illiterate employees, learnerships registered with the Department of Labour, internal and external bursaries and internships to be provided in	M	• SLP consultant/ external Officer to conduct a monthly audit and submit an annual monitoring to the DMR. •Do a skills analysis of the local community members in collaboration with the local Municipality, Community Forums and Ward Councillor to ensure that locals are considered for employment and training. •Take locals from surrounding villages, towns and settlements close to the project site into consideration for all potential training opportunities. Engage continuously with all stakeholders on employment and training opportunities should they arise. This will also form part of the overall Graspan mine 'Stakeholder Engagement Plan', SLP and the 'Socio-economic Assessment Tool', which will be managed by Graspan Mine. • Legislation stipulates that specific levels of training and skills are required to work for a mine. Only if skills are not available locally (nearby settlements	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		accordance the Mining Charter guidelines. Management will be responsible to develop career development and succession plans and to assess the potential of employees and establish a career path for each to ensure the development of each employee. The mine aims to exceed the compliance targets set by DMR for HDSA employment.		and local Municipal area) will personnel be sourced elsewhere.	
	Socio-Economic Impacts: Skills development and social responsibility	**Impacts on the local community / community projects** As part of a mine's Social and Economic Development responsibility, the mine must get involved with a relevant Local Economic Development Projects as identified in the IDP of a municipality.	M	•Set aside a budget for smaller ad-hoc community requested projects should individual community members require funding/loans to start-up small businesses, etc.	M
	Socio-Economic Impacts: Population impacts	**Impacts of an 'outside' workforce / migrant labourers** The Mining Charter requires that most permanent employees be sourced from the "local" area. Local employees are in turn defined as people that originate/live within a 50 km radius of the project site. In terms of the Graspan mine this would also include people from outside the Local Municipal area and would include people from as far as Ermelo, Davel, Hendrina and Other neighbouring areas. This definition of a local workforce could thus be in conflict with	M	• Graspan Mine must commit to work with the Ward Councillors, Community Forums and Local Municipality to establish the skills database and to set up a labour desk to source local workers as far as possible. • Only if skills are not available locally should outsiders be considered. • Define the definition of a "local workforce" and communicate this and the skills requirements to the local communities. Work with the local Municipality and Councillors to ensure that no unrealistic job expectations are created.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		the perception of a "local workforce" as seen by people living in close proximity to the Mine. Locals could thus perceive "outsiders" as stealing employment opportunities that should be reserved for them. Negative impacts that can manifest as a result of a migrant and/or "outside" workforce include: Impacts on population changes, as the "outside" /migrant workforce impacts on the population size, gender, racial and age composition of the local and regional municipalities Additional pressure on local government for housing and associated infrastructure and services if workers are retrenched and unemployed A rise in the number of size of informal settlements if workers are retrenched; impacts on the HIV/AIDS prevalence rate, unwanted pregnancies and the subsequent pressure on health core services, if short-term relations were established with local women and the migrants return to their families in the sending areas An increase in unemployment placing pressure on the local municipality to provide jobs if the workers are retrenched Safety and security issues for the surrounding communities due to a			

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		growth in the number of unemployed people			
		Impacts on the size and structure of the local Municipal area Employment opportunities associated with coal mining and commercial and industrial developments contribute to population growth in Msukaligwa LM. These factors add to the fact that Msukaligwa is one of the fastest growing municipalities in South Africa. Coal mining and industry also affect the gender and age ratio of the local population, as employment is primarily male dominated. The Municipality population consisted of a lot of female that are not employed or that are staying at home Impacts on the size and structure of the Municipal population have already manifested, and further changes as a result of the Graspan mine are not anticipated. Emphasise is once again placed on the employment of locals.	L	• Females must be employed in numbers.	L
	Socio-Economic Impacts: Impacts on infrastructure and services	**Impacts associated with blasting** Information received from the applicant indicates that blasting will be done on the opencast mining. Blasting operations and the associated ground vibrations have the potential to affect structures in the study area.	L	• When blasting take place, landowners and the community will be informed of the blasting schedule and limit blasting to daytime hours. • A full blasting impact assessment study has been undertaken in order to address the aspects and to put proper controls in place. (See appendix 13)	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		Impact on servitude Potential damage on water pipelines which belongs to farm householders and electricity power lines.		• On-going consultation with farms and Eskom to relocate the power lines and if ever there is no need to relocate, thud the mine should adhere to Eskom standards which states that operations should take place 30m away from power lines.	
		Impacts on road infrastructure It is anticipated that a conveyor belt will be used to transport coal to nearest rail-siding and the impact on the road surfaces due to trucks and large vehicles from Graspan mine during the operational phase will be minimal.	L	• Mine will continuously upgrade and maintain the roads around the mine, more especially those that will be used by the trucks from the mine. • Inform the Municipality of damage to road surfaces and potholes	L
	Socio-Economic Impacts: Community / Institutional arrangements	**Attitude formation and mobilization against the project (adjacent private landowners)** Negative attitude formation and mobilisation against the proposed mining operation has already manifested (definite conflict between the current lessee, community and different forums who are fighting to be recognised).The Davel Business Forum is trying to hijack the project from the community. The Mine would especially need to address negative impacts associated with the 'sense of place' and potential pollution issues (water, air and so forth) for the impact severity to reduce. Open and clear communication with stakeholders is essential.	M	• Finalise the forum and community structure and submit the resolution to DMR before commencement of operations. • Ensure that land owners and affected communities are continuously updated with regards to new developments that might affect them.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Socio-Economic Impacts: Community / Institutional arrangements	**Attitude formation for or against the project (local communities)** At this stage the local communities who would benefit through employment, perceive the project as positive. However, issues that transpired during the operational phases of similar mining projects and that affected the community's relationship with the mining companies negatively included: • Community with regards to employment and if "locals" are not considered fairly for employment; • Perceptions of nepotism during the employment process • Perceptions that locals do not benefit from projects that were identified in the consultation process. • The attitudes of local communities towards the project are at this stage largely positive, as employment is expected. Mobilisation and negative attitude formation against the project is however possible and has been defied from adjacent farm dwellers.	M	• Be aware not to raise unrealistic expectations amongst the local communities with regards to employment, skills requirements and new community projects. • The mine should enforce skills analysis for local communities, train and employ locals. • Continuously engage with the local communities and provide updates through the Councillors, Forums and other structures with regards to the implementation of SLP projects and targets. Make the annual SLP progress reports available for public scrutiny if required.	M
	Socio-Economic Impacts: Individual and family level impacts	**Disruptions in daily living and movement patterns** Factors that could contribute negatively towards disruptions in daily living and movement patterns include:	M	• If a conveyor belt is used to transport the coal to nearest rail-siding, the potential impact on living and movement patterns are regarded as low. • Announce disruptions, road closures and detours by using the local media, road sign boards and other Municipal structures.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Trucks and other mine vehicles that are not roadworthy and negligent drivers that disobey traffic rules, disregard speed limits and cause obstructions • Damage to the road infrastructure and relocation resulting in an increase in accidents, frustrated motorists and financial implications for local and provincial government • An increase in traffic on the local access and haul roads (gravel roads), resulting in impacts for locals, farmhouses and crops (dust pollution) and health impacts (respiratory diseases). • On site machinery and equipment will potentially also increase dust and noise pollution that could result in impacts on the 'sense of place' for surrounding landowners.		• Implement and Enforce golden rule penalties for reckless drivers to enforce compliance to traffic rules and speed limits. This is particularly pertinent for trucks and other vehicles that travel on the roads near sensitive receptors (farmhouses, local businesses, communities, etc.). • Inspect trucks and other heavy vehicles on a regular basis to avoid oil spillages and un-roadworthy vehicles that could result in accidents. • Where relevant install silencers on machinery and trucks. • Limit operations and the movement of trucks on the access and haul roads to reasonable daytime hours. • Display a contact number on trucks where motorists can report reckless driving. • The mine to consult with adjacent and other affected landowners whose private residences, crops and other infrastructure could be affected by dust, noise, blasting and other impacts that result from traffic movement and the mining activities. • The mine should develop traffic management plan.	
	Socio-Economic Impacts: Individual and family level impacts	**Impacts of the conveyor belt** Currently there is no mine plan, hence the conveyor belt's route is unknown at this point. Impacts that could occur include safety issues for humans and animals, dust, illegal trespassing and security impacts (theft of the conveyor belt infrastructure, etc.).	H	• Fencing of the mining area and the conveyor belt. • Erect signboards that warn of the dangers of the conveyor belt and indicate areas that are off limits for the public.	H
	Socio-Economic Impacts:	**Relocation of individuals and families** No forced relocation of individuals and families would manifest. The farm	M	• On-going communication between the current lessee and the landowner which is the department of public works.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Individual and family level impacts	portion where the mine shaft complexion is to be located would be leased to the department of Public works. However, disruption on the current lessee who is using the land for agricultural activities has been identified due to impacts on land use competition', potential groundwater impacts, financial impacts and land use changes for current farming. The proposed mining operation could result in the 'voluntary' relocation of landowners with negative economic impacts (devaluation of properties, costs associated with relocation, loss of incomes, etc.) and disruptions in social, economic and cultural ties and activities for affected parties.		• Proper allocation of the land between two lessees (Agricultural activity lessee and Mining Lessee). • The mine to consult with adjacent and other affected landowners whose private residences, crops and other infrastructure could be affected by dust, noise, blasting and other impacts that result from traffic movement and the mining activities which have commenced.	
	Socio-Economic Impacts: Individual and family level impacts	**Illegal trespassing** Illegal trespassing will occur at stockpile area due to Zama-Zama's trying to coal.	H	• Implement and increase security measures control access to the mine and avoid trespassers. • Fencing of the mining area and the conveyor belt.	H
	Socio-Economic Impacts: Individual and family level impacts	**Security impacts** Crime activities are common in and around the mining areas. The in-migration of 'outsiders' (jobseekers) during the operational phase could contribute to an escalation of illegal informal settlements and an increase in local unemployment levels, which would have a negative effect on crime.	M	• Should crime escalate and unacceptable levels of crime and safety-related issues occur during the operational phase, collaborate with the Ward Councillors and SAPS and compile an action plan that would address the implementation of additional and stricter security measures. • Establish a channel where incidences of illegal trespassing and the occurrence of illegal settlements can be reported as soon as it occurs.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Socio-Economic Impacts: Land use impacts	**Impacts on land and land use changes** The proposed mining area's extent is 346, 4648 hectares and will affect 1 farm portion which is portion 10 of Graspan 222 IS. Current land uses on this property include: • Farming • Farm residential plots • Wetlands (two identified pans) present on site. • Graves • The construction of the shaft complex and associated infrastructure and conveyor belt will result in the loss of arable soils and current agricultural land uses could be affected. • Underground mining will not affect existing land uses directly, however the opencast will affect a portion of the land use. Impacts associated with mining, such as groundwater pollution, dust, health impacts, traffic impacts and impacts on the 'sense of place' could result in the voluntary relocation of locals.	L	• Disturbance to occur only on the development path areas. • Restrict development over unprotected or sensitive areas unless if it is approved by the relevant regulators.	L
	Socio-Economic Impacts: Land use impacts	**Impacts on agricultural practices** The deterioration and contamination of groundwater quality, dust and security issues would be the greatest threat to current agriculture in the area. Significant negative economic impacts for the landowners are possible,	M	• Make procedures to lodge complaints available to private landowners. Prompt landowners to make use of these channels, maintain open communication, attend to issues as soon as possible and provide feedback on a regular basis. • Implement all the mitigation and management measures as proposed by the Geohydrologist as the availability and quality of groundwater and the	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		resulting in job losses for existing employees.		protection of surface water would mitigate land use impacts to a large extent.	
	Socio-Economic Impacts: Land use impacts	**Impacts on future land developments** Similarly, it is possible that future investments to be made by other land owners, whether residential or agricultural related, would be impacted due to the uncertainties of the mining right and the possible impacts it might have on their property values. Should the mining right be awarded, restrictions by the Graspan Mine with regards to the erection of new buildings and structures on private owned land is probable (structures could negatively impact the mine development and mining activities).	M	• The likelihood of the impact occurring is definite, as it has already manifested. With mitigation the impact on future land developments are still possible with a moderate overall significance for affected parties. • Communication and further consultation to be initiated with surrounding landowners regarding the way forward. No commitments for indirect impacts can be made that is not already included in the mitigation strategies of environmental specialist reports such as visual, noise, air quality and ground water, and as adopted into the EMPr.	M
	Socio-Economic Impacts: Land use impacts	**Land claims** At this stage there are one known land claim on the affected land portion and was confirmed by Regional Land Claims Commissioner. The rightful land claimants are yet to be identified included in the consultation process.	H	• Ongoing communication with the Regional Land Commission is underway to finalize the letter. • Once the rightful land claimants are given the land back, there should form part of the shareholding.	H
	Socio-Economic Impacts: Health and safety impacts	**Health and safety risks for workers** Mining activities could impact on the health and safety of workers: • Use of the continuous mechanical miners may generate dust, resulting in respiratory diseases	H	• Dust monitoring at the mine workings and implement enough dust suppression. • Employees are provided with dust masks that minimize dust inhalation. • Issue employees with PPE and instructions how to use it. • Ensure all vehicles and machinery are maintained regularly and enforce speed limits on site.	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		• Employees working near mine machinery will be exposed to high levels of noise, which may, in the long term, be detrimental to their health. • An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women, unwanted pregnancies that place further pressure on Basic Health Care Services. Employees that live away from their families tend to have long-term relationships with multiple partners and often do not consistently use condoms. The risk of contracting HIV is also significant when women aim to start or extend their families;		• Provide safe and clean drinking water and provide regular Fatigue breaks to keep workers hydrated. • Appoint mine Mobile clinic to implement awareness campaigns (HIV/AIDS/TB, blood pressure, Body Mass Index, Fatigue management, overall emphasis on healthy lifestyle, chronic disease management and wellness) to improve knowledge in the workplace and in the surrounding communities, provision of home-based care and counselling and educating the people at schools and in the community about the pandemic. • Encourage employees on health and wellness screening by providing initiatives of gifts for those that will volunteer.	
	Socio-Economic Impacts: Traffic	**Traffic accidents on access and haul roads** There is a possibility of accident occurring between LDV's and haul trucks. Road accidents (it is anticipated that large construction vehicles will leave the site only for major overhaul and maintenance purposes, as the conveyor belt will be used to transport coal).	H	• Mine to develop VMP (vehicle management plan) which will assist by separating light vehicles from heavy vehicle. • Install signage's in all access and haulage roads • Improve visibility by watering the access and haulage roads to reduce dust. • Restrict speed limits to (30-40km/h) • Implement and enforce golden rules • Mine to offer defensive driving training • Conduct alcohol tasting in all mine entrances to ensure drivers are not operating mine vehicles or equipment's under alcohol influence. • Mine to test drivers and issue them with mine driving permits.	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		Community health and safety risks Surrounding landowners, residents and road users in and around the proposed new shaft development, stockpile areas and settlement dams (PCD) could be subject to community health and safety impacts if the operation of the mine is not managed adequately. Possible impacts during the operational phase are not unlike those that could be experienced during construction, albeit with a lower severity and could include: • Unauthorised access/trespassing at the shaft complex and conveyor belt, resulting in theft and related public safety issues • Veld fires and the possibility of fires spreading and damaging surrounding farmland, private properties and infrastructure. • Dust generation and air pollution caused by gravel roads and vehicle emissions and machinery resulting in respiratory diseases • Possible subsidence of undermined areas during the operational phase and thereafter • Possible accidents and death should people get in contact with the conveyor	H	• Dust suppression and monitoring is conducted on the gravel roads, mine processing plant, stockpile areas, etc. • Limit the number of access gates and ensure 24-hour security and other relevant security measures. • Fence and prevent access to mining areas, borrow pits, conveyor, etc. where safety hazards could occur. • Stability of pillars in workings to be monitored. • Post information boards about public safety hazards and emergency contact information. • Fire breaks to prevent the spreading of veld fires, should it occur. • Ensure that the personnel on site are trained in first aid and procedures to follow in case of fire breakouts and other emergency situations. • Procedures set out in the mine Emergency Response Manual to be followed, such as emergency response drills carried out throughout the year and regular auditing and questioning of the key personnel involved in emergency responses.	H
Operation of	Soil, Surface and Ground water	Spillages can result in contamination of soils, surface and ground water.	M	• Regular inspections and maintenance of the pipelines and sewage walls. • Spillages to be contained in the Storm Water Management Structures of the Infrastructure area.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
Sewage treatment plant				• All sewage treatment and disposal to the environment to be done as per the water use license application.	

16.17 Impact assessment the closure phase

Table 37: Impacts and proposed mitigation measures of activities in the Closure phase of the Mining project

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
Closure and rehabilitation of surface mining (Box cut)	Biodiversity	**Topsoil, Overburden and ROM Stockpiles** **Landscaping and Replacement of Soils** • Surface mining activities usually mix the originality of the soil. **Box cut, opencast mining with a Roll over Rehabilitation Sequence** • Large area covered by box cut or open pit. **Access and Haul Roads Construction** • Compacted access and haulage rods they sterilize the soil due to compaction. • Imported road materials usually hamper fertility of the soil. **Mobile offices, toilets and sanitation** • Structures erected can cause completion on soil. **Pollution Control Dam (PCD)**	L	**Topsoil, Overburden and ROM Stockpiles** **Landscaping and Replacement of Soils** ▪ Final mitigation to reshape the landscape as close as possible to its original topographic features (e.g. slope and drainage lines, wetlands). ▪ Rehabilitation activities to place the plinthic and grey clay material in the sub-soils and the original A and B horizon material on top. Create an environment where the topsoil is at least 40- 60cm deep for proper aeration water holding capacity and drainage, resulting in proper root development. **Seeding with Grass Species and Legume Crops** ▪ Rehabilitation strategy to consider a three-stage approach where pioneer species is planted to create a soil environment for sub-climax species. After some time, climax species can be introduced. There are many case studies where reseeding is necessary because the sub-climax and climax grass species die back after the first or second season. ▪ Post rehabilitation land use to consider legume crops like soya, cow peas, Dolichos, or Lucerne to improve the soils microbial activity and soil structure.	L

		• PCD covers large areas where vegetation has to grow. **Demolished structures prior mining and post mining** • There are currently demolished cemented housing structures. • The structures prior and post mining if they are not removed, they cannot sustain the ecosystem.		▪ Application of compost and other organic humic substances can be used to speed up the process of restoring soil Biodiversity **Box cut, opencast mining with a Roll over Rehabilitation Sequence** The excavated area must serve as a final depositing area for the placement of all waste and above mentioned stockpiles during mining. ▪ Rocks and coarse material removed from the excavation must be dumped into the excavation. ▪ Once excavations have been refilled with overburden, rocks and coarse natural materials and profiled with acceptable contours and erosion control measures, the topsoil previously stored, shall be returned to its original depth over the area. ▪ The area shall be fertilized if necessary, to allow vegetation to establish rapidly. ▪ The site shall be seeded with a local or adapted indigenous seed mix in order to propagate the locally or regionally occurring flora. **Access and Haul Roads Construction** • Roads shall be ripped or ploughed, appropriately fertilized (based on a soil analysis study) to ensure the re-growth of vegetation. • Imported road construction materials which may hamper re-growth of vegetation must be removed and disposed of in an approved manner prior to rehabilitation. • Roads that can and will be used by other users post closure should, however, be left provided this is agreed upon by all parties concerned. **Mobile offices, toilets and sanitation** On completion of operations, all buildings, structures or objects on the office site shall be dealt with in accordance with section 44 of the Mineral and	

				Petroleum Resources Development Act, 2002 (Act 28 of 2002): ▪ Where office sites have been rendered devoid of vegetation/grass or where soils have been compacted owing to traffic, the surface shall be scarified or ripped. ▪ Areas containing sanitation drains shall be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface. ▪ The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora. ▪ Photographs of the office sites, before and during the mining/ operation and after rehabilitation, shall be taken at selected fixed points and kept on record for the information of the Regional Manager. Pollution Control Dam (PCD) • The PCD and associated structures (pipelines) erected will be removed at closure. • The plastic lining must be removed and can be recycled. • The earth walls will be flattened, and the area profiled and re-vegetated. Demolished structures prior mining and post mining • The rubbles from prior and post mining structures will be returned or used to backfill the box cut upon closure. • Once the entire mine site infrastructure is demolished (including new infrastructure discussed above), the areas must be covered with a minimum of 300 mm of uncontaminated topsoil and vegetated with vegetation that is suitable for the type of soil and climate.	

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
Removal of infrastructure area, conveyor and shafts	Soil	Compaction and contamination from heavy vehicles usage and spillage of hydrocarbons, reagents (from infrastructure and machinery), raw materials and dirty water runoff, and the loss of soil due to erosion by wind and or water.	M	• Return of the stored soils onto areas of disturbance where infrastructure has been demolished and removed. • Contour and stabilise slopes to be free draining and limit/control vehicle movement and dirty water outflows. • Introduction of vegetation cover and irrigation in the first months of introduction or until such time, vegetation's sustain itself.	L
	Vegetation	Increase in alien vegetation of the site are common due to indigenous vegetation clearance. Alien vegetation can be introduced by humans, vehicles and natural winds.	M	• Re-establish indigenous vegetation as soon as possible. • Conduct alien species survey quarterly. • Establishment of an Alien Invasive management plan and implementation thereof on a yearly basis.	L
	Air Quality	**Demolition and removal of all infrastructure (incl. transportation off site)** Demolition of buildings and foundation and subsequent removal of rubbles generated. There is cleaning-up of workshops, fuels and reagents, removal of power and water supply, removal of haul and access roads. Potential for impacts during this phase will depend on the extent of demolition and rehabilitation efforts during closure as well as features which will remain. The process includes dismantling and demolition of existing infrastructure, transporting	M	• The area of disturbance must be kept to a minimum, as demolition should be done judiciously avoid the exposure of larger areas to wind erosion. • Speed restrictions when vehicles are loading demolished materials should be imposed and enforced. • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust. • Exhaust pipes of vehicles should be directed so that they do not raise dust. • Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust. • Dust suppression of roads being used during rehabilitation should be enforced.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		and handling of topsoil on unpaved roads in order to bring the site to its initial/rehabilitated state. Demolition and removal of all infrastructures will cause fugitive dust emissions.			
	Noise	Demolition activity has also the potential to increase noise levels. Demolition can sometime be made possible by use of explosives (Blasting).	M	**Pre-planning phase mitigation options be adhered to.** Proper or better selection of demolition method must be undertaken. Communication between the communities and the mine developers need to be implemented and maintained, highlighting the outcome mine area. The mine developer should consider co-ordinate, working time with periods when the communities are likely not at home. An example would be to work within the 8 am to 2 pm timeslot to minimize the significance of the impact.	L
	Surface water	Composition of infrastructure) can potentially cause contamination and deterioration in water quality due to erosion.	M	• Ensure that demolished materials are removed immediately after being demolished to avoid contamination.	L
Closure of the underground mine	Ground water	• Deterioration of groundwater quality • Leaching/Seeping of contaminants into sub-surface	H	• A three-year water monitoring programme post closure must be imposed. • A pollution control dam (PCD) could be used to intercept polluted seepage water. This should be considered if it is found that the Olifant's and Bankspruit are indeed negatively affected by pollution. Regular sampling of the streams/rivers/wetlands is essential to decide on this option if needed. • Implement as many closure measures during the operational phase, while conducting appropriate monitoring programmes to demonstrate actual	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
				performance of the various management actions during the life of mine. • All mined areas should be flooded as soon as possible to minimise oxygen from reacting with the remaining pyrite. • Mining should remove as much coal as possible from the underground and separate acid forming and non-acid forming material. • Monthly groundwater sampling must be conducted to establish a database of groundwater quality to assess plume movement trends. • Audit the monitoring network annually. • Geochemical testing of the ROM should be conducted to aid in the prediction of contaminant release and potential geochemical changes induced in the subsurface, by means of geochemical modelling. • Clean and dirty water trenches should be separated as planned. • Waste rock dumps and stockpiles can be lined with available compacted clay from the area to minimise infiltration of contamination.	
	Ground water	Decant increase of the level of water table	H	• Mine to consider treatment of the decant water. • Major fractures encountered while mining must be sealed by grouting, both on inflow and outflow areas • A decant management plan will be developed at mine closure. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Treated water will be discharged to the river as per DWS standard or supplied to the nearest farming plots.	M

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Ground water	**Formation of AMD** At the closure and decommissioning phase, ingress of water and oxygen into the workings could lead to AMD due to sulphide minerals present. Should the contaminated mine water decant onto surface and then be allowed to enter into the surface water resources of the area, it would have a significant impacting potential, resulting in pollution of the surface water resource.	H	• Geochemical assessment and modelling exercise should be conducted to determine the post closure quality of mine water associated with the both the underground and incline shafts. This will also benefit the Water Use Licence Application in process. • Optimise storage of mine water in mined-out underground sections. • Install high pressure seal in the incline underground development to the mined-out workings. • The shafts will be sealed, backfilled and made free draining. • The underground workings will be left to fill with water to a pre-determined environmental safe level (below decant level) before active water level management is implemented through pumping. • Monthly monitoring of water levels and water quality. • The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level. • A decant management plan will be developed at mine closure. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Treated water will be discharged to the river system as per DWS standards or neighbouring farming plots.	H

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Socio Economic	Loss of employment due to closure of mine	H	• Employee supporting initiatives such as Counselling and assistance is provided, in collaboration with the workers and union representatives, to workers to overcome shock and distress of being retrenched and assistance is necessary in obtaining other employment and manage retrenchment packages. • Proper retirement plans and savings.	M
	Topography	Sinkholes of the rehabilitated area will cause ponding that will cause an increase in the recharge into the mined-out workings	H	• Install ground-level movement monitoring systems.	M
	Soils	Topsoil will be mixed during the placement procedures.	M	• Consider natural system with materials from the B horizons first and overlay it with the A horizon soils. Avoid overload of trucks to prevent spillages of topsoil. Avoid driving over the topsoil areas to limit compaction and rip the topsoil after placement.	L
	Vegetation	Failure to establish vegetation on the areas where the infrastructure was removed can enhance the possibility of the establishment of alien vegetation.	L	• Re-establish indigenous vegetation as soon as possible after the placement of the topsoil. • Return the land to agriculture and support it.	L
	Air Quality	**Rehabilitation (spreading of soil, re-vegetation & profiling/contouring)** There is the reshaping and restructuring of the landscape. Since this is an underground operation mainly, the area to be reconstructed will be limited to the infrastructure and shaft areas. There is less transfer of soil from one area to other therefore negligible chances of dust through wind erosion. Profiling of dumps	L	• Plants used for re-vegetation should be indigenous to the area, hardy, fast-growing, nitrogen-fixing, provide high plant cover, be adapted to growing on exposed and disturbed soil (pioneer plants) and should easily be propagated by seed or cuttings. • The area of disturbance must be kept to a minimum, as demolition should be done judiciously avoid the exposure of larger areas to wind erosion. • The bare soil will be prone to erosion and therefore there is need to reduce the velocity near the surface of the soil by re-vegetation.	L

Activity	Environmental aspect	Potential impact	Significance before mitigation	Mitigation type	Significance after mitigation
		and waste rock dump to enhance vegetation cover and reduce wind erosion from such surfaces post mining.		• Leaving the surface of the soil in a coarse condition reduces wind erosion and ultimately reduces the dust levels. • Additional mitigation measures include keeping the soil moist using sprays or water tanks, using wind breaks. • The best time to re-vegetate the area must be linked to the distribution and reliability of the rainfall. • Speed restrictions should be imposed and enforced. • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust. • Exhaust pipes of vehicles should be directed so that they do not raise dust. • Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Dust suppression of roads being used during rehabilitation should be enforced. • It is recommended that the rehabilitation by vegetating should begin during the operational phase already as the objective is to minimise the erosion. • These measures should be aimed to reduce the potential for fugitive dust generation and render the impacts on ambient air quality negligible.	
	Visual	Final rehabilitation, after care and maintenance of the vegetation and to ensure that the final landform is maintained.	M	• Return the land closer to its natural state. • Plant some indigenous trees to create a barrier between the neighbours and roads. • Dust from Stockpile areas, roads and other activities must be managed by means of dust suppression to prevent excessive dust. • A wind barrier system that encloses the stockpiles and tailing dumps;	M

16.18 Cumulative impacts

Table 38: Assessment of potential cumulative impacts

Activity	Environmental aspect	Potential Impact	Significance before mitigation	Mitigation type	Significance after mitigation
Graspan Mine Project	Visual	The construction of the proposed Graspan mine with its associated infrastructure will increase the cumulative visual impact of mining/industrial type infrastructure within the region. In context of the existing mining and agricultural character, the construction phase of the mine will contribute to a regional increase in heavy vehicles on the roads in the region, with construction activity noticeable. In context of the existing mining and agricultural character, the operational phase of the mine will contribute to a regional increase in small vehicles on the roads in the region. An overland conveyor will also be added to the scenery of the immediate surroundings	H	• The visual impact can be minimized by the creation of a visual barrier along the roads. The area will be rehabilitated after mining is concluded and thus the visual impact will be removed, and the area will be restored. • The cumulative visual intrusion of the proposed Graspan mine mining activities will be medium as the main mining activities will happen underground and the footprint of the proposed surface infrastructure is relatively small. • The visual impact and impact on sense of place of the proposed project will contribute to the cumulative negative effect on the aesthetics of the study area.	M
	Biodiversity	The impacts on the ecology of the area will be significant more especially on the surface mining or box cut area, if highly sensitive areas are disturbed such as wetlands. It is expected that there will be losses of vegetation and flora along with associated faunal habitat. The primary impacts will be fragmentation and edge effects with a reduction in movement of remaining naturally occurring and isolation of pockets of vegetation.	M	• Construction of all above surface infrastructure on agricultural land • Implement or adopt mitigations by biodiversity study.	L

Activity	Environmental aspect	Potential Impact	Significance before mitigation	Mitigation type	Significance after mitigation
	Soil and topography	Sinkholes are commonly associated with underground mining is subsidence.	H	• Monitor of the ground level movements.	L
	Ground water	The groundwater quality will be contaminated due to mining activities.	M	• Monitoring of ground water to form a baseline • Update hydro census	M
	Socio Economic	Project, together with other existing and planned mining operations will result in several economic benefits for local communities through direct and multiplier effects. These effects are usually stimulated by wage bills, local and regional procurement spend, and investment into LED. The proposed Project will add to the existing positive effect of mining on local economic development by applying best practice in terms of local employment and procurement, as well as LED.	P	• No mitigation for this positive impact needed.	P
		Population influx is also likely to exacerbate pressure on existing infrastructure and services, and the growth or establishment of informal settlements.	H	• Communication with the municipality • Formalisation of informal settlement	M

16.19 Summary of specialist reports

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

Table 39: Specialist summary report

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
Biodiversity studies: **Flora**	• The study did not identify all site species due to time constraint and the season this study was undertaken, therefore before mining activities including site establishment are undertaken species identification must be undertaken to ensure that no protected or listed species are removed without knowledge; and • Irreplaceable and Optimal Critical Biodiversity Areas are located at less than 2 km east of the proposed site, these areas must be marked on the site layout plan as "No-Go" areas and it must be ensured that disturbances are restricted to mining areas.	X	Attached detailed biodiversity study report.
Geo-Hydro Assessment	<u>Monitoring</u> ❖ Conduct water monitoring and implement remedial actions as required and effective rehabilitation to as close to pre-mining conditions as practically possible. ❖ It is recommended that the monitoring network be extended to all the boundaries; north, south, east and west of the proposed mining right. The construction must be overseen by a qualified Hydrogeologist to monitor pollution in the upper weathered aquifer as well as the lower fractured aquifer. ❖ A monitoring network should be dynamic. This means that the network should be extended over time to accommodate the migration of contaminants through the aquifer as well as the expansion of infrastructure and/or addition of possible pollution sources. An audit on the monitoring network should be conducted annually <u>Modelling</u> ❖ The numerical model should be recalibrated as soon as more hydrogeological data such as monitoring holes are made available. This would enhance model predictions and certainty	X	Attached detailed Hydrogeology study report.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
	<u>Water contamination</u> ❖ Prevention of pollution of surface water resources and impacts on other surface water users by training of workers to prevent pollution, equipment and vehicle maintenance, fast and effective clean-up of spills, effective waste management, manage clean and dirty water in accordance <u>Flow of water</u> ❖ The disturbance of streams and surface drainage patterns and reduction in flow to downstream must be mitigated through careful design of ephemeral stream diversion that minimizes impacts on the downstream environment, limit activities and infrastructure within wetland and watercourses and their floodlines and implementation of storm water management plan to divert clean water ❖ Clean water trenches should be constructed surrounding the mining right to prevent clean water from entering the mining area, regarded as a dirty water catchment ❖ Dirty water trenches must be constructed as well to direct water from the mine to the pollution control dam, thereby preventing any contaminant water from leaving the mine area.		
Soil, land use and land capability Assessment	• The proposed mining land should be returned to its origin as before mining activities and the rehabilitation performance assessment in the proposed land must be done progressively (annually) during the operational phase by a soil specialist. • Final surface rehabilitation of all disturbed areas during mine activities. Rehabilitation of unnecessary water management facilities once appropriate to do so. • Specialists should be used to evaluate the erosion and other possible impacts during the entire mining process. • Limit impacts to the footprints to keep physical impacts as small as possible. Areas for road, site lay-out should be minimized, dust generation.		Attached detailed soil and land study report.
Traffic impact assessment	• Improve the geometrics of Sluiter Road and Bankpan/Davel Road to allow for traffic to turn on designated lines; • The preferred road must be the road from the farm into the Sluiter St then the N11, this have fewer traffic and shorter in distance; and	X	Attached detailed Traffic study report.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
	• A three-year monitoring program of all the affected roads must be developed to assess the effectiveness of recommended measures.		
Storm water management plan	• All dirty water generated on the site will be directed to the relevant PCDs and reused in the mining operations. • Surface water impacts from the site can be effectively mitigated by applying best practice water management principles. • The success of surface water impact management will be judged based on successful prevention of spills from the site.		Attached detailed Storm water management study report.
Heritage impact assessment	• From a heritage perspective supported by the findings of this study, the proposed mining development and associated developments are feasible. However, the proposed mining development should be approved to proceed as planned under observation that the development dimensions do not extend beyond the proposed sites. • Although located across the main road, the recorded burial site must be demarcated by a danger warning sign and must be clearly marked to avoid any accidental damage by especially heavy construction and haulage trucks. • The applicant must ensure that the descendants of the recorded graves are sought and notified about this proposed development has an impact (directly or indirectly) on their burial site. • No stone robbing, or removal of any material is allowed. Any disturbance or alteration on this burial site would be illegal and punishable by law, under Section 36(3) of the NHRA. • Noteworthy that any measures to cover up the suspected archaeological material or to collect any resources is illegal and punishable by law. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA. • The footprint impact of the proposed mining development and associated infrastructure should be kept to minimal to limit the possibility of encountering chance finds. • Should any unmarked burials be exposed during mining, affected families must be tracked and consulted, relevant rescue/ relocation permits must be obtained from SAHRA before any grave relocation can take place. Furthermore, a professional archaeologist must be retained to oversee the relocation process in accordance with the National Heritage Resources Act 25 of 1999. • Should chance archaeological materials or human burials remains be exposed during mining work on any section of the proposed mining development laydown sites, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial	X	Attached detailed Heritage study report.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
	action is warranted, is to minimize disruption in mining scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the PHRA and NHRA regulations (see appended Chance Find procedure for further details). • The Project Public Participation Process should ensure that any cultural heritage related matters for this project are given due attention whenever they arise and are communicated to PHRA throughout the proposed project development. This form of extended community involvement would pre-empty • any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study. • All landowners must be requested to declare burial sites within their farmsteads and cane fields to the EAP. • Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP there are no other significant cultural heritage resources barriers to the proposed mining right application. The Heritage authority may approve the proposed development to proceed as planned with special commendations to implement the recommendations here in made.		
Agricultural potential assessment	• A soil stripping Guideline • Some fertility sampling to asses baseline conditions for rehabilitation • Specialist should be used to evaluate the quality of the soil and other possible impacts during the entire mining process, during mine closure; soil should be sampled to check the fertility before the land is used for agricultural purpose • Limit impacts to the footprints to keep physical impacts as small as possible. Areas for road, site-layout should be minimized and clearing of unused area must be avoided. • Soil monitoring should be done by a specialist	X	Attached detailed Agricultural study report.
Blasting Impact Assessment	• Singo Consulting (Pty) Ltd was contracted by Increadable Berachot Mining and Trading (Pty) Ltd as part of Environmental Impact Assessment (EIA) to perform an initial review of possible impacts with regards to blasting operations in the proposed new opencast mining operation. Ground vibration, air blast, fly rock and fumes are some of the aspects as a result from blasting operations. The report concentrates on the ground vibration and air blast intends to provide information, calculations, predictions, possible influences and mitigations of blasting operations for this project. • The evaluation of effects yielded by blasting operations was evaluated over an area as wide as 3,500m from the mining area considered. The range of structures observed is typical roads (gravel) and informal building style houses.	X	Attached detailed Blasting study report.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
	• This project is a greenfields project with no existing blasting operations. The location of structures around the project area is such that the charge evaluated showed possible influences due to ground vibration. The planned minimum and maximum charge evaluated showed acceptable levels with no specific negative influences expected. The ground vibration levels predicted ranged between 0mm/s and 1.8mm/s for structures surrounding both pit areas. Ground vibration on water table is a concern. • Air blast predicted showed some concerns for opencast blasting. Maximum air blast levels predicted showed levels just greater than the limit for structures. Minimum and maximum charge predictions identified that only the farmhouses closer to the propose blasting area could experience high levels of air blast that may be experienced or heard with no specific negative structural influences. The current accepted limit on air blast is 134dBL. Damages are only expected to occur at levels greater than 134dB. It is maintained that if stemming control is not exercised this effect could be greater with greater range of complaints or damage. The proposed blasting area located such that "free blasting" – meaning no controls on blast preparation – will not be possible. • This concludes this investigation for the proposed mining permit Project. There is no reason to believe that this operation cannot continue if attention is given to the recommendations made.		
Palaeontology Study	• We recommend that one or two sites be preserved for posterity, the selection of them being determined by quality of the fossils, and practical issues such as being far away from development and interference by people and livestock, and also have some means of monitoring the safekeeping in place. Once construction has begun and if good exposures are found then the contractors and/or Eskom should contact a palaeontologist urgently to do a rescue operation.	X	Attached detailed Palaeontology study report.
Rehabilitation Plan	• Ensure that all water users have been identified and that the applicable authorisations are obtained in terms of the NWA (obtain WUL before construction or operation of the mine is undertaken) • It is recommended that the financial provision for closure and rehabilitation be annually updated as per the requirements of the MPRDA • Surface water monitoring of the pans and associated wetlands surrounding the project area is to be undertaken to determine the impacts associated with operations of the proposed mine • Final rehabilitation must be guided by the current soil status which were confirmed during soil analysis by ARC.LNR. the results attached as appendix 3 on this report • Regular audits should be undertaken by a soil scientist during the soil stripping process. This will guarantee that soil is stripped and stockpiled correctly • Regular audits should be undertaken to monitor the progress of areas that have been rehabilitated	X	Attached detailed Rehabilitation study report.

List of studies undertaken	Recommendations of specialist reports	Specialist recommendations included in the EIA report	Reference to section in report included
	• Long term management of the rehabilitated areas will be required via contractual agreements with landowners in the area and rehabilitation should also be undertaken to best practice • An independent Environmental Assessment Practitioner (Singo Consulting Pty Ltd) shall be appointed to ensure compliance with requirements of the Final Rehabilitation, decommissioning and Closure Plan		
Wetland Study	• The toilets and change area, portion of the coal washing area and the dirty water catchment are within an identified channelled valley-bottom wetland, these should be moved to a drier area or alternatively the activities on the wetlands must be included in the Water Use License Application (WULA); • The identified wetlands must be clearly marked as "No-Go" areas and if possible they must be demarcated to maximise their protection; • Access routes including footpath must be developed around the wetlands and not through the wetlands; • The Boundaries of the wetlands buffers must be made known to all mining personnel to prevent encroachment into wetlands buffers; • Integrated Waste and Water Management Plan for the proposed mine must be developed and approved by relevant professionals to limit impacts into the wetlands and other water sources; and • An alien invasive plants management plan must be compiled and implemented to prevent encroachment of alien plant species into the delineated wetland areas.	x	Attached detailed Wetland study report.

Attach Specialist Reports on Appendices Sections:

17 ENVIRONMENTAL IMPACT ASSESSMENT

17.1 Summary of the key findings of the EIA

The EIA confirms that the proposed activities (without mitigation) are expected to have impacts of high significance in relation to groundwater, surface water, and socio-economic conditions. The key impacts relating to the Graspan Mine with high significance before mitigation are included in the following table.

Table 40: Summary of high-impact activities

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
Construction	Construction of the pollution control dam.	Surface water	• Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of these facilities. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality. • Blasting of surfaces, footprint clearance on the sites of the proposed processing plant and other infrastructure, and other excavations in the mining area are likely to lead to increased sediments in runoff water.	High (-)	Medium (-)
	Shaft development and associated conveyor route development between Graspan Mine and nearest rail-siding	Surface water	• Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	High (-)	Low (-)
		Noise	• Construction activities may cause an increase in background noise levels. Blasting of the shafts and ramp material may cause structural damage to property and be a danger to people and animals within 500 m of the blast area. Drilling of blast holes can potentially cause an increase in background noise levels. It also has the potential to cause deterioration in air quality due to generation of dust and vehicle emissions. • Noise impact that would only occur in the operational phase. • Noise level can be controlled by means of berms and shielding structures.	High (-)	Medium (-)
		Heritage structures	• Construction activities have the potential to impact the historical structures.	High (-)	Medium (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
		Noise	• Noise impact that would only manifest in the operational phase but that can be avoided in the construction phase by implementation of measures in construction of ventilation shafts. • Impacts of noise need to be controlled by means of berms and shielding structures.	High (-)	Medium (-)
	Socio-economic impact of the Graspan Mine project as a whole		**Health and safety risks for workers** • Inadequate management of the construction process and general construction related activities could result in health and safety risks for workers, manifesting in the following ways: • Construction related accidents due to structural safety of project infrastructure. The excavation of the shaft will result in the formation of topographical voids, which may be a safety risk to the employees, livestock and neighbouring landowners. • Dust generation and air pollution resulting in respiratory diseases • High ambient noise levels caused by machinery and construction equipment resulting in health issues for workers. • Poor management of the construction process resulting in pollution problems (e.g. insufficient sanitation facilities, littering and refuse), fly's rodents and pests and possible contamination of water sources. • Unsafe and insufficient drinking water • An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women, unwanted pregnancies that place further pressure on Basic Health Care Services. • Dehydration and sunburn, as high temperatures could be experienced during summer months.	High (-)	Medium (-)
	Socio economic of the Graspan Mine project as a whole		**Community health and safety** • Residents, surrounding landowners and road users could be subject to community health and safety impacts if the construction process is not managed adequately. This could include: • Road accidents, subsequently placing pressure on local emergency, disaster management and health services (fire, ambulance, police services, etc.) • Unauthorised access/trespassing at the construction site, resulting in theft, public safety issues and even death	High (-)	Medium (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
			• Fire hazards at the construction site and the possibility of fires spreading and damaging surrounding farmland and infrastructure. • Dust generation and air pollution caused by gravel roads, and machinery resulting in respiratory diseases.		
Operational	Operation of shafts, conveyor belt and infrastructure area containing stockpiles	Surface water	Loose material as well as the contaminated overburden material can contaminate surface water during rainfall events resulting in dirty water runoff. Runoff from areas where hydrocarbon spills are present may also cause deterioration in surface water quality.	High (-)	Low (-)
		Ground water	Seepage from the overburden stockpile can contaminate the groundwater immediately below the stockpile as well as adjacent areas.	High (-)	Low (-)
		Air quality	**Dust from Material Handling** Material handling of coal and crushed coal are potential sources of dust emissions at the various handling stations. Handling stations include the conveyor transfer points and the loading of the conveyors. Various climatic parameters e.g. Wind speed and precipitation influence the amount dust generated from material handling operations. The volume of material being moved and height that the material is dropped at also influence the dust generation at the various handling points. Dust can influence adjacent roads and households	High (-)	Medium (-)
		Noise	During the operational phase, increased noise levels can be expected	High (-)	Medium (-)
		Groundwater	**Underground (Lowering of groundwater levels- boreholes)** The mining operation in the operational phase may draw down the water table, affecting boreholes of adjacent property owners	High (-)	Medium (-)
Operational	Underground crushing and screening of coal	Air quality	**Emissions by means of crushing and screening** In this activity, the use of the primary and secondary crusher and Discard handling are the most likely to have implications on ambient air quality. The crushing process releases fugitive dust, especially if there are no enclosure and water sprays. Dust contained within the RoM ore can be released into the atmosphere during this process i.e. fugitive dust (containing TSP, as well as PM10 and PM2.5). Wind erosion from stockpiles can be a perennial source of dust if not properly managed during and post mining operations. The plant, crushing and screening areas all have the potential to generate dust and	High (-)	Low (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
			therefore specific mitigation measures can be assigned to each of these activities.		
	Operation of the Graspan Mine in general	Socio-economic Impacts: Local economic impacts	**Impacts on procurement / supporting industries / local SMMEs** The Mining Charter sets BEE compliance guidelines and as such Graspan Mine will have to procure all products and/or services from BEE compliant outlets. In order to ensure and promote the procurement of products and/or services from SMMEs who are BEE compliant as well as black owned and/or black empowered, strategies are identified in the Colliery's SLP. It is expected that most goods and services will be available locally from within the Municipal area. Supporting industries, local SMMEs and contractors include: • Contractors to transport and dispose of domestic and industrial waste • Equipment cleaning (trucks, conveyors, belt) • Maintenance and repairs of infrastructure, roads, etc. • Operation of tuck shops • Laundry and catering services • Security, etc.	Medium positive	High positive
		Socio-economic Impacts: Skills development and social responsibility	**Impacts on the local community / community projects** As part of a mine's Social and Economic Development responsibility, the mine must get involved with a relevant Local Economic Development Projects as identified in the IDP of a municipality. Graspan Mine is however not in the position to get involved with the day-to-day running of a LED project.	Medium positive	High positive
		Socio-economic Impacts: Individual and family level impacts	**Impacts of the conveyor belt** At this stage the exact properties to be impacted by the conveyor belt's route is unknown. Impacts that could occur include safety issues for humans and animals, dust, illegal trespassing and security impacts (theft of the conveyor belt infrastructure, etc.).	High (-)	High (-)
		Socio-economic Impacts: Individual	**Illegal trespassing** Illegal trespassing could occur at the shaft complex and along the conveyor belt route, resulting in safety (death) and security issues (theft, vandalism, etc.). Should the recruitment process not be managed adequately, illegal	High (-)	High (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
		and family level impacts	informal settlements could be established on private land if workers and contractors want to reside close to their place of employment.		
		Socio-economic Impacts: Individual and family level impacts	**Health and safety risks for workers** Mining activities could impact on the health and safety of workers: Use of the continuous mechanical miners may generate dust resulting in respiratory diseases Employees working near mine machinery will be exposed to high levels of noise, which may in the long run be detrimental to their health Traffic accidents on access and haul roads An increase in HIV/AIDS and other STDs due to prostitution activities and temporary sexual relationships with local women, unwanted pregnancies that place further pressure on Basic Health Care Services. Employees that live away from their families tend to have long-term relationships with multiple partners and often do not consistently use condoms. The risk of contracting HIV is also significant when women aim to start or extend their families; Accidents due to structural safety of project infrastructure and so forth	High (-)	High (-)
		Socio-economic Impacts: Health and safety impacts	**Community health and safety risks** Surrounding landowners, residents and road users in and around the proposed new shaft development, stockpile areas and settlement dams could be subject to community health and safety impacts if the operation of the mine is not managed adequately. Possible impacts during the operational phase are not unlike those that could be experienced during construction, albeit with a lower severity and could include: • Road accidents (it is anticipated that large construction vehicles will leave the site only for major overhaul and maintenance purposes, as the conveyor belt will be used to transport coal). • Unauthorised access/trespassing at the shaft complex and conveyor belt, resulting in theft and related public safety issues • Veld fires and the possibility of fires spreading and damaging surrounding farmland, private properties and infrastructure • Dust generation and air pollution caused by gravel roads and vehicle emissions and machinery resulting in respiratory diseases.	High (-)	High (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
			• Possible subsidence of undermined areas during the operational phase and thereafter • Possible accidents and death should people get in contact with the conveyor.		
Closure	Closure of underground mine	Groundwater	**Deterioration of groundwater quality** Leaching/Seeping of contaminants into sub-surface	High (-)	Medium (-)
			Decant Rise of water table	High (-)	Medium (-)
			Formation of Acid Mine Drainage (AMD) • At the closure and decommissioning phase, ingress of water and oxygen into the voids could lead to AMD due to sulphide minerals present. • Local patches of mine water in contact with carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded this acidic water will meet the neutral-alkaline drainage from the silicate minerals. • Although the heterogeneity and the probable mixing of different geochemical units give uncertainty to the exact quantification of the groundwater parameters, the average mine water will only be slightly acidic over the long term in the post-closure mine system under the conditions assumed in the modelling. • Should the contaminated mine water decant onto surface and then be allowed to enter into the surface water resources of the area, it would have a significant impacting potential, resulting in pollution of the surface water resource.	High (-)	High (-)
		Socio-economic	**Loss of employment due to closure of mine** Due to the closure of the mine, job losses will occur	High (-)	Medium (-)
	Rehabilitation	Topography	Subsidence of the rehabilitated area will cause ponding that will cause an increase in the recharge into the mined-out workings	High (-)	Medium (-)
	Closure of underground mine	Groundwater	**Formation of Acid Mine Drainage (AMD)** At the closure and decommissioning phase, ingress of water and oxygen into the voids could lead to AMD due to sulphide minerals present.	High (-)	High (-)

Phase	Activity	Aspect	Potential impact	Pre-mitigation	Post-mitigation
			Local patches of mine water in contact with carbonaceous material will be acidic as the carbonate minerals are not efficient to neutralize the acid produced. As the mine gets flooded this acidic water will meet the neutral-alkaline drainage from the silicate minerals. Although the heterogeneity and the probable mixing of different geochemical units give uncertainty to the exact quantification of the groundwater parameters, the average mine water will only be slightly acidic over the long term in the post-closure mine system under the conditions assumed in the modelling. Should the contaminated mine water decant onto surface and then be allowed to enter the surface water resources of the area, it would have a significant impacting potential, resulting in pollution of the surface water resource.		
		Socio-economic	**Loss of employment due to closure of mine** Due to the closure of the mine, job losses will occur	High (-)	Medium (-)
	Rehabilitation	Topography	Subsidence of the rehabilitated area will cause ponding that will cause an increase in the recharge into the mined-out workings	High (-)	Medium (-)

17.2 Final site map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided including buffers. Attach as Appendix 4.

A map as required in this Section has been attached in Appendix 4.

17.3 Positive and negative implications and risks of the proposed activity and identified alternatives

All alternatives have been assessed along with the advantages and disadvantages of the various alternative options and preferred site layout options. Positive and Negative impacts were listed in table 35 of this report.

17.3.1 Proposed impact management objectives and the impact management outcomes for inclusion in the EMPr

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

The purpose of the EMPr is to provide relevant management measures to conduct activities with due care and diligence, as well as avoid/ limit any adverse impacts of the mining operation. The EMPr is compiled to help control impacts that may occur to meet acceptable standards, both as a legal and social responsibility to the environment within which the activities take place.

The objective of the EMPr is to create management structures that address the comments of stakeholders with regards to the development, establishes a method of monitoring and auditing environmental management practices during all phases of the activity and ensures that safety recommendations are complied with. Additionally, the EMPr provides a method to ensure performance and compliance with all the relevant regulatory authority provisions and guidelines while monitoring of the commitments allows for continual feedback and opportunities to improve.

17.4 Final proposed alternatives

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

Proposed alternatives are detailed above and the positive and negative impacts of the alternatives and preferred option have been described. The final site map is a result of pre mining considerations of sensitive receptors, recommendations from the DWS and the evaluation of impacts is described in Table 1 and Figure 4.

17.5 Aspects for inclusion as conditions of authorisation

Any aspects which have not formed part of the EMPr that must be made conditions of the environmental authorisation. Increadable Barachot Mining and Traders (Pty) Ltd is a black owned company from historical disadvantaged background and does not have enough capital, however they are requesting to pay 50% of the required guarantee payment (R8 718 254.00) and the remaining balance to be paid within 6 months of production.

17.6 Description of any assumptions, uncertainties and gaps in knowledge

The following assumptions and limitations have been identified with regards to the environmental baseline, impacts and mitigation measures:

- The public participation process has been sufficiently effective in identifying the critical issues that needed to be addressed through specialist investigations and/or by the EAP. Specialist input has thus been appropriately scoped to investigate the critical issues;
- The public participation process has sought to involve key stakeholders and individual landowners. It is assumed that where participation has been sought from the organizational representative/s, that these parties have the authority to comment on behalf of their organisation;
- The public participation process provided offered opportunity for stakeholders to express any issues and concerns. It has thus been effective in identifying critical issues that the specialist investigations and/or EAP needed to address;
- A monitoring and evaluation system, including auditing, is recommended in line with this EMP, to track the implementation of this specific EMP to ensure that management measures are effective to avoid, minimize and mitigate impacts; and that corrective action is being undertaken to address shortcomings and/or non-performances.

18 REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD BE AUTHORISED OR NOT

18.1 Reasons why the activity should be authorised or not

To our knowledge, no fatal flaws have been identified. However, I&AP's have raised many concerns as per consultation report which includes but not limited to; several environmental and social impacts are envisaged from construction phase through to post-closure, which require careful mitigation and monitoring. It is the opinion of the EAP that all major impacts have been identified and have been assigned appropriate management measures. Most HIGH negative impacts with mitigation, are reduced to a MEDIUM or LOW significance, and can be managed accordingly. There are a few impacts that will stay at a High negative significance after mitigation and include Social Economic Impacts of the Conveyor belt, illegal trespassing, Health and safety risk for workers and community health and safety risk. Others are Ground water impacts in the Closure phase that is associated with the formation of Acid Mine Drainage.

Other positive impacts that results in a High Positive Significance after mitigation include the impact on procurement / supporting industries / local SMMEs, Impacts on the local community / community projects.

It is recommended by the EAP that the proposed black owned Graspan Mine be authorised, on the assumption that the environmental and social management commitments included in this EIA/EMPr are adhered to, the project description remains as per the description provided in this document and considering the positive social impacts associated with the project and there are already many mines that are operating from the proposed site which has been granted authorisation for. The negative and positive significance of impacts must be weighed up against each other for a final decision by the Competent Authorities.

18.2 Conditions that must be included in the authorisation

To ensure compliance with, and implementation of the EMPr by:

- Appointing of a suitably qualified individual to oversee implementation of the EMPr during all phases of the project; and
- Appointing a suitably qualified Environmental Control Officer to undertake audits on a regular basis throughout the construction phase
- To ensure that all staff, contractors and sub-contractors are aware of and understand the requirements of the EMPr and environmental issues in relation to their individual areas of work by:
    - Developing an induction and training program covering the EMPr, environmental awareness, dealing with environmental incidents and waste management; and

- Advising staff commissioned during pre-construction and construction, including subcontractors, of EMPr requirements through the induction program as well as on notice boards at the contractor's camps during construction and notice boards during operation. These notice boards should cover the EMPr, environmental awareness, dealing with emergencies and waste management.
- Compile with all Water Use Licence (WUL) Authorisations and update water balance before commencement.
- The undertaking of a detailed Geo-Hydrological study with special reference to Acid Mine Drainage. The groundwater model predictions should be verified once time dependent groundwater monitoring data become available. Predicted flow simulation and decant rates for later years of mine development can significantly be improved by observation data from earlier years and subsequent updates of the groundwater model.
- Authorization should be subject to the undertaking of a ground water monitoring programme with associated updated hydro census. The monitoring programme should cover pre and post mining conditions to evaluate and determine the effect of mining on ground water supply, and pollution.

18.2.1 Rehabilitation requirements

The requirements of the final rehabilitation, decommissioning and mine closure plan are stated in Appendix 4 of the NEMA Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations (GNR 1147). The purpose is to identify a post mining land use that is feasible through the following:

- The requirements of the final rehabilitation, decommissioning and mine closure plan are stated in Appendix 4 of the NEMA Regulations Pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations (GNR 1147). The purpose is to identify a post mining land use that is feasible through the following:
- Providing the vision, objectives, targets and criteria for final rehabilitation, decommissioning and closure of the project;
- Outlining the design principles for closure
- Explaining the risk assessment approach and outcomes and link closure activities to risk rehabilitation;
- Detailing the closure actions that clearly indicate the measures that will be taken to mitigate and/or manage identified risks and describes the nature of residual risks that will need to be monitored and managed post closure;

- Committing to a schedule, budget, roles and responsibilities for final rehabilitation, decommissioning and closure of each relevant activity or item of infrastructure;
- Identifying knowledge gaps and how these will be addressed and filled;
- Detailing the full closure costs for the life of project at increasing levels of accuracy as the project develops and approaches closure in line with the final land use proposed; and
- Outlining, monitoring, auditing and reporting requirements.

Large volumes of soil need to be stripped and stockpiled for later use in mine site rehabilitation particularly from the stockyards, laydown and railway loop sites. The use of stripped stockpiled soil for rehabilitation purposes must include detailed post rehabilitation however pre-vegetation soil analysis as well as detailed liming and fertilizer recommendations based on the soil analytical results, as well as the type of vegetation to be established. The surrounding land uses are associated with cultivated and livestock farming, wetlands and waterbodies, farmhouses. These planned project activities that may be implemented within the applied land will change the land capability for the lifetime of mine, whereas land use is modified from wild to mining among the mine site. However, rehabilitation and mitigation will change the land capability at the best back to grazing enabling the land use to also change to grazing.

18.3 Period for which the environmental authorisation is required

Environmental authorisation will be required for the following periods:

- Construction = 2 years
- Operation = 30 years (including ramp up and ramp down)
- Closure = 2 years

18.4 Undertaking

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

The EAP undertakes that the information provided is correct, and that the comments and inputs from stakeholders and Interested and Affected parties are been recorded in the report. The undertaking of the EAP is included in the end of the EMPr in Part B, and is also an undertaking for Part A.

18.5 Financial provision

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

Increadable Barachot Mining and Traders (Pty) Ltd is a black owned company from historical disadvantaged background and does not have enough capital, however they are requesting to pay 50% of the required guarantee payment (R8 718 254.00) and the remaining balance to be paid within 6 months of production. Financial provision is included in appendix 9.

18.5.1 Confirm that this amount can be provided for from operating expenditure

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

There are already engagements with potential investors for the project to run and also for rehabilitation processes. It is upon the granting of the project that all investors will bring forth all necessary capitals.

18.6 Deviations from the approved scoping report and plan of study

18.6.1 Deviations from the methodology used in determining the significance of potential environmental impacts and risks

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

Deviations from the scoping report include some specialist studies that were not undertaken but were indicated in the Scoping Report. Air quality and Noise studies were listed as part of specialist studies, however regarding the Graspan Mine they were done as part of desktop studies. IWWMP, Waste classification, Geotechnical and Hydro-Pedology studies were excluded in the EIA phase because of the requirement of these studies in the WULA process. These studies are being undertaken as part of the WULA requirements.

18.6.2 Motivation for the deviation

The fact that this is an integrated EIA application, some of the studies will be catered under WULA and Waste to form an integrated Environmental authorisation. Deviations from the scoping report include some specialist studies that were not undertaken but were indicated in the Scoping Report. Air quality and Noise studies were listed as part of specialist studies, however regarding the Graspan Mine they were done as part of desktop studies. IWWMP, Waste classification, Geotechnical and Hydro-Pedology studies were excluded in the EIA phase because of the requirement of these studies in the WULA process. These studies are being undertaken as part of the WULA requirements.

19 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

19.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the NEMA

The EIA report must include the following:

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

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

All impacts on socio-economic condition are assessed as part of the SLP and desktop EIA studies.

19.1.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act

Provide the results of Investigation, assessment, and evaluation of the impact of mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of national estate contemplated in section 3 (2) (i) (vi) of the Act, attach the investigation report as Appendix 2.18.2 and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6 and 2.12 herein.

The heritage assessment for the Graspan Mine project was undertaken. Mitigation measures were recorded into the EIAR and the specialist HIA study is included in appendix 11.

20 OTHER REQUIREMENTS IN TERMS OF SECTIONS 24(4)(A)AND (B) OF THE ACT

The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 2292)(h), exist. The EAP must attach such motivation as an Appendix.

Mineral resources are by nature are very difficult to locate as it requires extensive prospecting and calculated determination of stock. Minerals can only be mined where they exist. The proposed property is in an area where prospecting has indicated the presence of coal on this property. Alternatives were assessed in this report and impacts were assessed in the Impact Assessment tables(Table 35 to Table 40) of this report.

PART B: ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

1 ENVIRONMENTAL MANAGEMENT PROGRAMME

1.1 Details of the EAP

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

The details and expertise of the EAP are detailed in Part A 3. (a) (i) and (ii) and a cv is attached.

1.2 Description of the aspects of the activity

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

The details of the aspects of the activity are described above in Part A.

1.3 Composite map

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

Refer to Appendix 3-4 for the Graspan Mine layout with all sensitivities and buffers identified.

1.4 Description of impact management objectives including management statements (i) Determination of closure objectives

Ensure that the closure objectives are informed by the type of environment described in 2.4 herein.

The closure objectives for mining internationally and in South Africa focuses on the restoration of previous land use capabilities, the zero-net loss of biodiversity, and the satisfaction of community requirements. Project closure objectives for Graspan Mine will be in line with the above mentioned and is as follows:

- Re-establishment of the pre mining land use and land capability to a level as close as possible to the pre-mining environment
- Re-establishment of function to any biodiversity areas of concern that could and have been affected by the mining operations
- Prevent any form of contamination of soils, surface water and ground water.
- Implementation of on-going rehabilitation to regulated standards

- Implementation of sustainable community projects that will be self-driven after mine closure.
- Maintenance and Monitoring of rehabilitated areas.

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

Pumping of water from the mine as a result of the mining activity will be undertaken. Water pumped from the mine will be stored in the wastewater dams within the infrastructure area where appropriate treatment will take place. All measures and appropriate standards for discharge will be included in the Water use license application requirements. The sewage treatment plant will be a modular plant with effluent release to the water course. Leakages or failure of function of such a plant can lead to ecological degradation.

1.4.2 Potential risk of acid mine drainage

Indicate whether the mining can result in acid mine drainage.

As it is a coal mine there is potential for AMD from pyrite coal being exposed to oxygen and water. The potential contaminants that may emanate from the mining activities are Ca, Mg, Cl and SO4. There may be a possibility of acid generation. Potential risk of acid mine drainage has been identified through the hydro-geology study and mitigations have been included on the report in appendix 14.

1.4.3 Steps taken to investigate, assess, and evaluate the impact of acid mine drainage

A model is being constructed to quantify potential impacts on receptors such as groundwater users and rivers as part of water balance report. This model will as an important step be undertaken once enough chemical information is available on the coal. Once this is available the applicant will undertake the necessary specialist inputs to address the problem.

1.4.4 Engineering or mine design solutions to avoid or remedy AMD

As part of the WULA requirements; it is recommended that to avoid AMD, water need to be tested and if needed, be pumped into the pollution control dam (PCD). From the PCD, it will be pumped to the water treatment plant for treatment. After confirmation that the water is on the correct standard, water will be re-used or made available to adjacent farmers. The WULA will have mitigation measures and conditions to be implemented. More information will be gathered as part of the WULA process for this purpose and will include the waste classification and updated Geo-Hydrological study that will include geochemical sampling and analysis as well as constructing a geochemical model.

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

A model is being constructed to quantify potential impacts on receptors such as groundwater users and rivers as part of water balance report. This study is being compiled as part of the WULA requirements.

1.4.6 Volumes and rate of water use required for mining, trenching or bulk sampling

To be determined with the water use license application after additional studies and the water balance has been undertaken.

1.4.7 Has a water use license been applied for?

A water use licence application (WULA) has been submitted. A WULA is underway parallel to the mining right application. Some of the WULA studies will be updated and compliance level will constantly be monitored even after the mining right has been granted.

1.4.8 Impacts to be mitigated in their respective phases

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

See table 41 below .

Table 41: Impacts to be mitigated in their respective phases

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Soil	2ha	Construction of access road and haul roads	Soils will be stripped to construct proper roads. This could lead to and mixing of topsoil. Due to the presence of vehicles and equipment hydro-carbon spills may occur impacting on the quality of the soils.	• Roads will be constructed with rock material not containing any carbonaceous rock. • Spill kits to be stored on site, and staff will be trained to know how to act when spills occur. • Contaminated soil to be removed and transported to a treatment facility. • Drip trays to be used for vehicles that stand overnight.	Construction	Prevent soil contamination	Implement a monitoring programme Adhere to: GN 37603: Norms and standards for remediation of contaminated soils
Soil	34.35 ha	Stripping and stockpiling of topsoil	Topsoil will be stripped and stockpiled; this may cause deterioration in soil quality. During the stripping process topsoil may be mixed. Due to the presence of vehicles and equipment hydro-carbon spills may occur impacting on the quality of the soils.	• Topsoil and subsoil to be stockpiled separately and documented. • Stockpiles should not be allowed to be higher than 2 metres to preserve any potential seeds and regrowth potential . • Contaminated soil to be removed and transported to a treatment facility • Drip trays to be used for vehicles that stand overnight.	Construction	Prevent soil contamination	Implement a monitoring programme Adhere to: GN 37603: Norms and standards for remediation of Contaminated soils

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Soil	1 ha area	Construction of the pollution control dam.	Topsoil will be stripped as part of clearing the footprint of the dam. This may cause deterioration in soil quality. During the stripping process topsoil may be mixed. Due to the presence of vehicles and equipment hydro-carbon spills may occur impacting on the quality of the soils.	• Soils to be stripped in horizons and stockpiled separately. • All spills to be cleared • Use of drip trays for overnight storage of vehicles	Construction	Prevent soil contamination	Implement a monitoring programme Adhere to: GN 37603: Norms and standards for remediation of Contaminated soils
Soil	Shafts 0.01ha; conveyor route 26km	Shaft development and associated conveyor route development between the mine and Nearest rail-siding	Due to the presence of vehicles and equipment hydrocarbon spills may occur impacting on the quality of the soils. Spillages of overburden material during the transport activity can also cause a deterioration of soils.	• Soils from the SHAFT areas should be stockpiled on different stockpiles based on soil horizons and soil types • Spills will be cleared and remediated immediately as per the mine's Leak/Spill Procedure.	Construction	Prevent soil contamination	Implement a monitoring programme
Soil	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	During operation of the mine, it is anticipated that carbonaceous material may be spilled which will contaminate soils. Contamination by dirty water run-off and/or spillage of hydrocarbons and/or chemicals is also expected from	• All spills to be cleaned immediately after such an event. • Develop a hydrocarbon spill procedure for all possible areas of spillages. • Spill kits to be freely available • All vehicles to be stored and services in and on a bunded area, which is included in the	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			operations vehicles and machinery.	Storm Water Management system. • All storage and service areas of vehicles to drain into a sump with an oil separator.			
Soil	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Deterioration of topsoil quality due to salt contamination at the coal stockpile and crushing and screening plant footprints	• Structures that involve coralliferous material should have a compacted base layer which serves as a sealing layer to prevent contaminated water from seeping into the ground water system. • Proper runoff control structures should be in place which channels all polluted water into a pollution control facility.	Operational		
Soil	0.5ha area	Ablution and changing houses	Spillages can result in contamination of soils and ground water.	Spillages to be contained in the Storm Water Management Structures of the Infrastructure area. All sewage related impact and mitigations to be addressed as part of the water use license application			
Soil	Shafts 0.01ha; conveyor route 26km; Infrastructure	Removal of infrastructure area, conveyor and shafts	Potential for compaction and contamination from heavy vehicles usage and spillage of hydrocarbons, reagents (from infrastructure and machinery), raw	Re-instatement of the stored soils (most probably as berms) onto areas of disturbance where infrastructure has been demolished and removed. Contour and stabilise slopes to be free draining and	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			materials and dirty water runoff, and the loss of soil due to erosion by wind and or water.	limit/control vehicle movement and dirty water outflows. Planting of required vegetative cover and irrigation if required, will reduce/mange erosion, decrease compaction and stabilise the landform. This will once cover has been obtained, effectively see the sites returned to a grazing land capability rating.			
Soil	Infrastructure area; shafts 0.01ha.	Rehabilitation	Topsoil will be loaded from the stockpiles and loss of topsoil as well as compaction can occur. Topsoil will be mixed during the placement procedures.	Place material from the B horizons first and overlay it with the A horizon soils. Do not overload trucks to prevent spillages of topsoil. Limit driving over the topsoil areas to limit compaction and rip the topsoil after placemen.	Decommissioning		
Land capability	Within mining infrastructure area	Stripping and stockpiling of topsoil	Stripping and stockpiling of topsoil will result in the original land capability to cease completely until rehabilitation takes place.	Land capability to be restored as far as possible in the rehabilitation stage to arable land.	Construction	Restore land capability	n/a
Land capability	Within mining infrastructure area	Construction of the pollution control dam	During the construction and operation of the pollution control dam and water management infrastructure the original land capability classified as agricultural to cease completely.	Limit the area of the PCD vegetation clearance to a minimum	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			Note that these measures will remain post closure and will be of a permanent nature.				
Land capability	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development	Stripping and stockpiling of topsoil will result in the original land capability to cease completely until rehabilitation takes place.	Land capability to be restored in the rehabilitation phase of the project.	Construction and post closure		
Land capability	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Complete cease in land capability at the footprints of all structures that covers the surface during the operational phase.	No mitigation of loss in land capability is possible during the construction and operational phase because the land capability will remain ceased as long the structures covers the surface	Operational		
Land use	Infrastructure	Stripping and stockpiling of topsoil	Stripping of topsoil will result in the current possible land use to cease completely.	Land use currently mining and agricultural orientated. Land use to be determined after mining and rehabilitation has been concluded.	Construction	Restore land use	SPLUMA
Land use	Infrastructure	Construction of the pollution control dam and sewage treatment plant.	Construction of the water management measures and pollution control dam will result in the current possible land use to cease completely.	Rehabilitate area back to arable land			
Land use	Shafts 0.01ha; conveyor	Shaft development and associated	Stripping of topsoil will result in the current	Land use to be restored for arable land.	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
	route 26km; Infrastructure	conveyor route development between mines	possible land uses to cease completely.	Rehabilitation of areas should be conducted as soon as possible.			
Land use	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Stockpiling of overburden will result in the current possible land use (agriculture) to cease completely.	Rehabilitate as soon as possible and create a land use of agriculture although the land capability will be arable.	Operational		
Vegetation	2 ha	Construction of access road and haul roads	Vegetation will be removed during the construction of the roads where they are not situated within agricultural lands	Removal and storage of all usable soils to be used in rehabilitation. Access roads and haul roads to avoid sensitive areas	Construction	Re-vegetation	Biodiversity management plan
Vegetation	Shafts 0.01ha; conveyor route 26km; Infrastructure	Stripping and stockpiling of topsoil	Vegetation will be removed during the stripping of the topsoil and will also be affected during the stockpiling process. Note that no red data species were identified within the proposed mining area or at the stockpile area.	Only vegetation directly in the path of the proposed access roads and haul roads to be removed. Removal and storage of all usable soils to be used in rehabilitation.	Construction		
Vegetation	Infrastructure	Construction of the pollution control dam and sewage	Vegetation will be removed from the dam footprint area as well as where the cut off drains will be located.	pollution control dam and water management infrastructure. Infrastructure area to be located on cultivated land	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Vegetation	Shafts 0.01ha; conveyor route 26km;	Shaft development and associated conveyor route development between the mine and nearest rail-siding.	Vegetation will be removed during the construction of the shaft areas and conveyor route. These will not contribute significantly to direct habitat loss and fragmentation on a local scale. The change in land use is mainly related to existing transformed areas, namely cultivated land (more than 80%)	• Ensure availability of topsoil and subsoil for rehabilitation purposes. • No selling of topsoil is allowed. • Concurrent rehabilitation to be implemented to ensure topsoil is replaced as soon as possible. • Vegetation should be encouraged to establish on the stockpiles of topsoil and subsoils to curb potential erosion. • Avoidance of sensitive habitats and areas during the site selection process. • Fence development footprint area prior to commencement of construction to limit impact on adjacent vegetation areas. • Removal of vegetation should be restricted to the relevant infrastructure footprints only.	Construction and Operational		
	Shafts 0.01ha; conveyor route 26km; Infrastructure	Removal of infrastructure area, conveyor and shafts	Failure to establish vegetation would lead to an increase in alien vegetation of the site. Ensure that vegetation is established on the rehabilitated area of this	Re-establish indigenous vegetation as soon as possible after the placement of the topsoil. Ensure the area remains free of exotic species. Establishment of an Alien Invasive management plan and	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			site and control alien vegetation in this area.	implementation thereof on a yearly basis.			
Vegetation	Shafts 0.01ha; conveyor route 26km; Infrastructure	Rehabilitation	Transport activities can damage/destroy vegetation. Failure to establish vegetation on the areas where the infrastructure was removed can enhance the possibility of the establishment of alien vegetation.	• Trucks should remain on roads and designated areas • Re-establish indigenous vegetation as soon as possible after the placement of the topsoil. Ensure the area remains free of exotic species. • Pre mining land use was agriculture.	Decommissioning		
Biodiversity	Shafts 0.01ha; conveyor route 26km; Infrastructure	Construction of Infrastructure area, overland conveyor and ventilation shafts	Loss of species of conservation concern	• No clearance of vegetation where the mining will only affect the underground. • No clearance of indigenous vegetation in the 100m buffer zone will be allowed within the high and medium sensitive areas. • The unnecessary clearance of indigenous vegetation should be avoided as far as possible • Maintenance should not extend beyond the proposed study site. • Declared alien species should be prevented from occurring on site, as disturbance in natural habitat and compaction of soil usually leads to the	Construction	Prevent loss of Red Data species	Biodiversity management plan Implementation of EMPr and monitoring programme

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				establishment of alien plant species. • Construction activities should be restricted to the immediate area of development; • The recommendations of the ecological and botanical specialist studies must be strictly implemented; • Sensitive areas such as obvious wetlands and drainage lines need to be avoided where possible; • Minimising the destruction of or disturbance to vegetation within the proposed area of activity, as well as in the surrounding areas; • Preventing the unnecessary destruction of any natural habitat and animal life within the boundaries of the proposed area of development and adjacent areas; • Avoiding initial construction activity during spring/summer as most birds reproduce and disperse or migrate during this period; • Animals may under no circumstances be handled,			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				removed, killed or interfered with by the • Contractor, his employees, his Sub-Contractors or his Sub-contractors' employees. This includes foraging, food and wood collecting outside of the construction site. • Conservation orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for noncompliance. • Measures must be taken to ensure that workers are aware of laws and restrictions governing the hunting, capturing or trapping of animals and should be advised on the penalties associated with the needless destruction of wildlife.			
Visual	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Potential visual impact on the viewpoints that had a visual exposure rating of 5 or higher. The operational impact on the surrounding agricultural farmers and land users will be more significant, due to the visual intrusion and activities being	The visual impact can be minimized by the creation of a visual barrier. The area will be rehabilitated after mining is concluded and thus the visual impact will be removed and the area will be restored.	Operational	Lower visual impacts	n/a

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			undertaken. Although the mine activities will not be visible since it will all be underground, the stockpiles, waste rock dumps and related surface infrastructure will be visible for the entire life of mine.				
Visual	Shafts 0.2ha; conveyor route 10km; Infrastructure	Rehabilitation	Final rehabilitation, after care and maintenance of the vegetation and to ensure that the final landform is maintained.	• Plant some indigenous trees to create a barrier between the neighbours and roads. • Dust from Stockpile areas, roads and other activities must be managed by means of dust suppression to prevent excessive dust. • A wind barrier system that encloses the stockpiles and tailing dumps; • Stockpiles and waste rock dumps should not exceed 20m in height. • Rehabilitation of the area must be done as the mining is completed.	Decommissioning		
Surface water		Construction of access road and haul roads	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads. Runoff from areas	• All hydrocarbon spills to be contained and soils removed. • Proper storm water measures to be put in placer to prevent contamination of surface water. This will	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			where hydro-carbon spills are present may also cause deterioration in surface water quality.	include the construction of berms/ stockpiles to shield any surface water from mining activities.			
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Stripping and stockpiling of topsoil	Loose material can contaminate surface water in the event of a storm water run-off occurring during the stripping and stockpiling of topsoil. Runoff from areas where hydrocarbon spills are present may also cause deterioration in surface water quality.	• All hydrocarbon spills to be contained and soils removed. • Proper storm water measures to be put in placer to prevent contamination of surface water. This will include the activity of stripping and stockpiling of topsoil.	Construction	Prevent pollution of surface water SWMP implementation Monitoring	Implementation of EMPr and monitoring programme
Surface water	Infrastructure	Construction of the pollution control dam	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of these facilities. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality. Blasting of surfaces, footprint clearance on the sites of the proposed processing plant and other infrastructure, and	• Construction of cut off drains • Encourage vegetation of topsoil and subsoil stockpiles • Design all blasts by a professional and use electronic blasting techniques to limit the impact as far as possible;	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			other excavations in the mining area are likely to lead to increased sediments in runoff water.				
Surface water	Infrastructure	Construction of the pollution control dam	The transport, handling and storage of fuels, chemicals, construction materials and waste could lead to spills that contaminate soil surfaces and water resources.	• Waste must be discarded in an approved manner; • Fuel and oil storage areas should be bunded; and • Spills should be cleaned up immediately	Construction		
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development between mines	Loose material can contaminate surface water in the event of a storm water run-off occurring during the construction of the roads. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	• Measures to be implemented to separate clean and dirty water to ensure that dirty water does not contaminate clean water. • Contaminated water to be pumped to the PCD. • Surface water monitoring to be conducted	Construction		
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development between mines	During the construction phase topsoil will be stripped and civil works, in the form of earthworks and terracing, will be undertaken as part of the preparation of the area for the construction of infrastructure such as	• Construction will be limited to the project footprint. • "No-go" zones will be delineated for contractor's camp. • Appropriate stormwater management measures will be implemented, including the temporary diversion of upstream run-off from the	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			roads, change house, wash bays, offices, workshops, crushers, etc., including the conveyor. Construction equipment on the site.	construction and laydown areas. • Surface water management measures, such as stormwater canals, sediment traps and PCDs are to be constructed first to ensure that runoff and dirty water spills are contained. • Carbonaceous material from the overburden will be removed and will then be stored on site temporarily and returned underground for permanent storage. The overburden stockpile will not contain any carbonaceous material.			
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Loose material as well as the contaminated overburden material can contaminate surface water during rainfall events resulting in dirty water runoff. Runoff from areas where hydro-carbon spills are present may also cause deterioration in surface water quality.	• Clean and dirty water separation measures will be constructed around the stockpile area to separate the dirty areas from the clean areas. • The contaminated water will be collected and diverted via a pipeline to the pollution control dam. • Ensure that spills are cleaned up immediately to avoid surface water contact and contamination. • Implementation of the SWMP	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Impacts associated with the incline shaft area would be as a result of runoff entering the underground workings and encountering carbonaceous material.	• All facilities with the potential to generate dirty storm water runoff, effluent or washdown water will be located within the designated dirty water area. • Clean runoff will be diverted around the designated dirty areas by means of cut-off canals, sized to accommodate at least the 1:50 year peak flow event. • Adequate erosion protection will be provided at the clean canal discharge locations. • All spills will be contained within dedicated bunded areas (at wash bays, workshops, waste handling areas, etc.). • Both general and hazardous wastes will be stored in skips until removed from the site. The skips in turn will be located under in bunded areas. • There will be capacity to store a maximum of 132 m3 of general waste in waste bins during the life of the project. • The storage period will be less than 30 days before removal from the site by an appropriately licensed waste			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				removal contractor and disposed of at a licensed general waste facility. • Hazardous waste will be stored according to the applicable regulations under the National Environmental Management: Waste Act (Act 59 of 2008) and the DWS Minimum Requirements • The waste storage area will, as a minimum, be paved with concrete, covered and provided with bunds and drainage facilities to collect and contain any spills or adversely affected runoff • Waste oil will be stored in drums in a bunded storage area • Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil • All contaminated runoff and spills that escape bunded areas will be collected and contained in the PCD • All pipeline routes will be inspected regularly to enable early detection of leaks			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• All dirty storm water and wash down water will be collected in the PCD • Wash-down and wastewater from the workshops will be passed through oil skimmers before discharging to the storm water system for containment in the PCD and eventual treatment for reuse or pumping to underground storage. • An inspection and maintenance plan will be implemented on the storm water system to ensure that all oil skimming and sediment handling facilities are maintained, and that storm water canals and pipelines remain unblocked and free flowing – monthly inspections will be carried out • Spill-sorb or a similar type product must be kept on site and used to clean up hydrocarbon spills if they should occur • A surface water quality monitoring programme will be implemented to detect any impacts			
Surface water	Shafts0.01 ha;	Removal of infrastructure	Surface water runoff from the bare soil	• Ensure that the area is covered with topsoil and	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
	conveyor route 26km; Infrastructure	area, conveyor and shafts	surface areas (demolishment of the infrastructure) can potentially cause deterioration in water quality due to erosion and contamination of hydrocarbons. The area will be without a vegetation cover until being seeded.	that vegetation is established as soon as possible • Ensure that spills are cleaned up immediately to avoid surface water contact and contamination • Services of broken-down vehicles to be undertaken on bunded hard surfaces. • Contaminated surfaces and soils to be extracted and cleaned up before decommissioning of structures			
Surface water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Removal of infrastructure area, conveyor and shafts	Silt and other sediments arising on site could contaminate local surface water resources. Sedimentation will reduce effective storage capacity and increase downstream silt loads	• Waste must be discarded in an approved manner • Fuel and oil storage areas should be bunded; and • Spills should be cleaned up immediately	Decommissioning		
Air quality		Construction of access road and haul roads	Construction activities may cause dust that will influence the quality of air. Vehicle emissions can also cause deterioration in air quality.	Dust depressing methods to be implemented while construction of the access roads and haul roads take place. Water cars to be used to make sure dust impact are minimized	Construction	Minimize dust fallout to keep dust fallout levels at key receptor sites around the project area.	Dust monitoring programme. GNR 893 Minimum Emission Standards.
Air quality	Shafts 0.01ha; conveyor	Stripping and stockpiling of topsoil	Stripping and stockpiling of topsoil may cause dust due to vehicle movement that will	• Dust depressing methods to be implemented while construction of the access	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
	route 26km; Infrastructure		influence the quality of air. Material handling (topsoil) will generate dust and this and vehicle emissions can potentially cause deterioration in air quality.	roads and haul roads take place. • Water cars to be used to make sure dust impact are minimized. • Material handling must be limited to as little as possible to prevent the generation of dust.			
Air quality	Infrastructure	Construction of the pollution control dam.	Material handling during the construction of the pollution control dam, sewage treatment facilities and surface water management structures will generate dust and this and vehicle emissions can potentially cause deterioration in air quality.	• Ensure that vehicles are maintained • Implement dust depression • Monitoring of fallout dust on a monthly basis	Construction	within guideline levels.	
Air quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development	Construction activities may cause dust due to vehicle movement that will influence the quality of air. Drilling of blast holes can potentially cause deterioration in air quality due to generation of dust and vehicle emissions. Material handling (shaft material) will generate dust and vehicle emissions can potentially	• Dust suppression methods to be implemented, by means of water car • The active working area to be sprayed at least twice a day to limit dust • Limit areas of mining to smaller blocks with the implementation of concurrent rehabilitation to limit handling of material and therefore limit dust	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			cause deterioration in air quality.				
Air quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Construction of Infrastructure area, overland conveyor and ventilation shafts	Site clearing, removal of topsoil and vegetation	• Topsoil should not be removed during windy months (August to January) due to associated wind erosion heightening dust levels in the atmosphere. • The area of disturbance must be kept to a minimum and no unnecessary clearing of vegetation must occur. • Topsoil should be re-vegetated to reduce the exposure areas. • During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised. • Water or other binding agents such as (petroleum emulsions, polymers and adhesives) can be used for dust suppression on earth roads. • When using bulldozers and graders, there is need to minimise travel speed and distance and volume of traffic on the roads. • Stockpiles should not be left for prolonged periods as wind energy generates erosion and causes more dust to form	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• It should be noted that emissions generated by wind are also dependent on the frequency of disturbance of the erodible surface and therefore covering the stockpiles with vegetation would reduce the negative erosion effect • Any crusting of the surface binds the erodible material • All stockpiles should be damped down, especially during dry weather or re-vegetated (hydroseeding is a good option for slope revegetation) • Successful trialling of broadacre temporary rehabilitation of unshaped overburden emplacement areas by aerial sowing of a cover crop, providing an established vegetative stabilisation to minimise the potential for windblown dust generation • Constricting the areas and time of exposure of pre-strip clearing in advance of mining development			
Air quality	Shafts 0.01ha; conveyor route	Construction of Infrastructure area, overland	Construction of surface infrastructure (e.g. access roads, pipes, storm water diversion	• Dust emitted during bulldozing activity can be reduced by increasing soil dampness by watering the			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
	26km; Infrastructure	conveyor and ventilation shafts	berms, change houses, admin blocks, drilling, drilling blasting, development of box cut and decline shaft for mining, etc)	material being removed thus increasing the moisture content. • Another option would be to time the blasting with wind to ensure the dust will not be blown to the sensitive receptors or especially the community. • Blasting should also not take place when poor atmospheric dispersion is expected i.e. early morning and late evening. • Material need to be removed to dedicated stockpiles to be used during rehabilitation. • This hauling of materials should take place on roads which is being watered and/or sprayed with dust suppressant. • To reduce the amount of dust being blown from the load bin in the haul roads, the material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers. • Constricting the areas and time of exposure of pre-strip clearing in advance of			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				construction to limit exposed soil surfaces			
Air quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Construction of Infrastructure area, overland conveyor and ventilation shafts	General transportation, hauling and vehicle movement on site	• Hauling of materials and transportation should take place on roads which is being watered and/or sprayed with dust suppressant • Material being transported can be watered or the back of the vehicles can be covered with plastic tarpaulin covers • In order to mitigate the impacts of the activity, the speed limit should be kept to the low as more dust will be generated at higher wind speeds. • Speed limits need to be observed and adhered to. • Management should fit roads with speed humps to ensure adherence • Application of wetting agents or application of dust suppressant to bind soil surfaces to avoid soil erosion • The drop heights should be minimised when depositing materials to the ground • Encourage car-pool and bulk delivery of materials in order			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				to reduce the number of trips generated daily			
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Dust will be generated due to vehicle movement	Conduct dust suppression	Operational		
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Transportation of the workers and materials in and out of mine site will be a constant feature during the operational phase. This will however result in the production of fugitive dust due to suspension of friable materials from earth roads. It is anticipated this activity will be long-term and regional and will seize once the life of mine has been reached. Substantial secondary emissions may be emitted from material moved out from the site during grading and deposited adjacent to roads. Passing traffic can thus loosen and re-suspend the deposited	• Formulation and implementation of sound management plans for all operations likely to create dust • Planting plenty of trees or hedges as shelterbelts to eliminate or minimise wind disturbance • Planning operations to maximise the benefit of wind breaks • Disturbed areas such as those caused by stripping off grass and topsoil should be kept to a minimum • Roads and standing areas should be sealed or concreted where possible • Use water sprays or water carts to settle dust. Care must be taken to ensure that the water used is free from pollution by noxious matter. There are additives available	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			material again into the air. In order to minimize these impacts the stockpiles should be vegetated for the duration that it is exposed.	that reduce the volume of water used, and increase its effectiveness, but approval to use them should be obtained from the local territorial authority. • Use of a global positioning system as a tool to track the locations of mining and dust suppression equipment (e.g. water carts) and cross-referencing this information with real-time weather monitoring to assist with dust control • Use of water sprays at each contact or transfer point along the conveyance system which have adjustable rates of application (low, medium and high) depending on dust levels • Automatic water sprays installed at the ROM hopper bin that produce a fine mist to suppress dust generated with the triggering of sensors when a truck enters the dump zone and automatic sprays activated until a set time following the departure of the truck • Use of a reclaim tunnel at the product stockpile and an			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				enclosed conveyor to transfer minerals to the loader, both of which minimise dust generation • Use of a retractable telescopic chute with curtains to load minerals into transport trucks • Speed restrictions should be imposed and enforced • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust • Exhaust pipes of vehicles should be directed so that they do not raise dust • Engine cooling fans of vehicles should be shrouded so that they do not raise dust • Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust			
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Dust from Material Handling	• Water sprays at the material handling points. • Covered conveyor transfer points • Material wetting before being transferred • Traffic control by restricting vehicle speed • Implementation of a dust monitoring programme	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Windblown dust from conveyor	• Dust suppression spraying of transfer points • Install wind barriers on upwind side of the conveyor • Cover the conveyor in the direction of the predominant wind direction	Operational		
Air Quality		Underground crushing and screening of coal	Emissions by means of crushing and screening	• Implement a primary underground screening and crushing plant • Dust can be reduced by providing a controlled fine water spray system that directs water onto the input material before it enters the crusher (be careful not to over water as this can cause further problems down the production process) • Dust extractor hoods and cyclone collectors and/or bag filters. This is particularly suitable for use on the output chute or stone box under the crusher • Where practicable, stone boxes on process plants can direct and slow the fall of material onto conveyor belts, and thus the amount of dust generated at transfer points • Crushing often requires constant supervision;	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				therefore, some extra operator protection at this typically dusty process is almost always required • In order to reduce dust contamination in crusher control rooms and operator's positions, these areas should be completely enclosed and ventilated with uncontaminated air to create a positive air pressure			
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Removal of infrastructure area, conveyor and shafts	Demolition & Removal of all infrastructure (incl. transportation off site)	• Demolition should not be performed during windy periods (August, September and October), as dust levels and the area affected by dust fallout will increase. • The area of disturbance must be kept to a minimum, as demolition should be done judiciously avoid the exposure of larger areas to wind erosion. • Speed restrictions should be imposed and enforced. • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust • Exhaust pipes of vehicles should be directed so that they do not raise dust • Engine cooling fans of vehicles should be shrouded	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				so that they do not raise dust • Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust • Dust suppression of roads being used during rehabilitation should be enforced			
Air Quality	Shafts 0.01ha; conveyor route 26km; Infrastructure	Rehabilitation	Rehabilitation (spreading of soil, re-vegetation & profiling/contouring)	• Plants with roots that bind the soil, and vegetation cover should be used that breaks the impact of falling raindrops, thus preventing wind and water erosion. • Plants used for re-vegetation should be indigenous to the area, hardy, fast-growing, nitrogen-fixing, provide high plant cover, be adapted to growing on exposed and disturbed soil (pioneer plants) and should easily be propagated by seed or cuttings. • The area of disturbance must be kept to a minimum, as demolition should be done judiciously avoid the exposure of larger areas to wind erosion. • Spreading of soil must be performed on less windy days.	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• The bare soil will be prone to erosion and therefore there is need to reduce the velocity near the surface of the soil by re-vegetation. • Leaving the surface of the soil in a coarse condition reduces wind erosion and ultimately reduces the dust levels. • Additional mitigation measures include keeping the soil moist using sprays or water tanks, using wind breaks. • The best time to re-vegetate the area must be linked to the distribution and reliability of the rainfall. • Speed restrictions should be imposed and enforced. • Cabs of machines should be swept or vacuumed regularly to remove accumulated dust. • Exhaust pipes of vehicles should be directed so that they do not raise dust. • Engine cooling fans of vehicles should be shrouded so that they do not raise dust. • Dust suppression of roads being used during			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				rehabilitation should be enforced. • It is recommended that the rehabilitation by vegetating should begin during the operational phase already as the objective is to minimise the erosion. • These measures should be aimed to reduce the potential for fugitive dust generation and render the impacts on ambient air quality negligible.			
Noise		Construction of access road and haul roads	Construction activities may cause increase in background noise levels.	Servicing of all vehicles to be undertaken on a regular basis to prevent excessive noise from machinery.			
Noise	Shafts 0.01ha; conveyor route 26km; Infrastructure	Stripping and stockpiling of topsoil	Stripping and stockpiling activities may cause an increase in background noise levels.	The construction of the stockpiles will limit noise beyond the mine.	Construction	identified noise receptors	Ambient Levels and SANS 10210 of 2004, the national standard for the calculating and predicting of road traffic noise SANS 10328 of 2008 Noise Control Regulations – General Notice R154 of 10 January 1992

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Noise	Infrastructure	Construction of the pollution control dam	Activities may cause an increase in background noise levels.	• The construction of the stockpiles will limit noise beyond the mine • Underground mining has limited noise • Baffling of machinery	Construction		
Noise	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development	Construction activities may cause an increase in background noise levels. Blasting of the shafts and ramp material may cause structural damage to property and be a danger to people and animals within 500 m of the blast area. Drilling of blast holes can potentially cause an increase in background noise levels. It also has the potential to cause deterioration in air quality due to generation of dust and vehicle emissions.	• Machinery to be baffled • Construction of a berm around the boundary of the mining areas to limit impacts of blasting • Evacuate anyone within 500 metres of a proposed blasting site • Place seismographs in specific surrounding areas to monitor vibrations in terms of blasting.	Construction		
Noise	Shafts 0.01ha; conveyor route 26km; Infrastructure.	Construction of Infrastructure area, overland conveyor and ventilation shafts	During construction phase increased noise levels can be expected at directly adjacent households to the proposed shaft complexes and the conveyor route.	• Communication between the receptors and the developer need to be implemented and maintained, highlighting the outcome of this study. The developer should consider coordinate the working time with periods when the receptors are likely not at	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				home. An example would be to work within the 8 am to 2 pm time-slot to minimise the significance of the impact due to: • Potentially receptors are most likely at school or at work, minimizing the probability of an impact happening; and • Normal daily activities will generate other noises that would most likely mask construction noises, minimizing the probability of an impact happening. Ensure a good working relationship between the project representative and all potentially sensitive receptors. Communication channels should be established to ensure prior notice to the sensitive receptor if work is to take place close to them. Information that should be provided to the potentially sensitive receptor(s) include: • Generally construction activities should not take place before 8am and after 5pm and not on Sundays and public holidays. This would however not always be			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				realistic, as deadlines and specific construction activities could take 12+ hours. • How long the activity is anticipated to take place; • What is being done, or why the activity is taking place; • Contact details of a responsible person where any complaints can be lodged should there be an issue of concern. • If blasting is required to take place near a receptors dwelling (within 500m), the developer must consult with a Vibration & Blasting Specialist.			
Noise	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts and area conveyor belt infrastructure curtaining	During the operational phase, increased noise levels can be expected	• Pre-planning phase mitigation as discussed in the operational phase impact assessment options are adhered to. • Communication between the receptors and the developer need to be implemented and maintained • Ensuring that equipment is well maintained and fitted with the correct and appropriate noise abatement measures. Acoustical mufflers (or silencers) should be	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				considered on equipment exhausts. A noise absorption braid could be mounted on the front of heavy equipment radiators (ADT's, FELs etc.) to prevent excess mechanical fan noise into the surrounding environment. Engine bay covers over heavy equipment could be pre-fitted with sound absorbing material. Heavy equipment that fully encloses the engine bay should be considered, ensuring that the seam gap between the hood and vehicle body is minimised.			
Noise	Shafts 0.01ha; conveyor route 26km; Infrastructure	Removal of infrastructure area, conveyor and shafts	This activity has also the potential to increase noise levels.	• Pre-planning phase mitigation options be adhered to. • Communication between the receptors and the developer need to be implemented and maintained, highlighting the outcome of this study. The developer should consider coordinate the working time with periods when the receptors are likely not at home. An example would be to work within the 8 am to 2 pm time-slot to minimise the	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				significance of the impact due to: • Potentially receptors are most likely at school or at work, minimizing the probability of an impact happening; and			
Heritage	Shafts 0.01ha; conveyor route 26km; Infrastructure	Shaft development and associated conveyor route development	Construction activities have the potential to impact the historical structures.	• Most old buildings have been demolished • A marked grave is situated in the infrastructure area and must be avoided • Any activity on the area of the grave must be applied for.	Construction	Protection of all Heritage Resources	National Heritage Resources Act 25 of 1999
Ground water		Construction of the incline shaft	Influx of groundwater into incline shaft void	• Sealing of incline shaft walls with shotcrete/gunite which will allow groundwater levels to reduce and re-establish the cone of depression. • Provide affected borehole users with alternative sources of water, should their groundwater volumes be impacted on. • The hydrocensus should be updated one year prior to the construction phase of the project, to confirm boreholes users' yield and groundwater quality around the shafts area.	Construction	Protection of ground water resources Avoid pollution Prevention of AM Prevention of mine contaminating ground water resources	WULA standards to be achieved Water quality monitoring and monitoring programme

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Ground water		Construction of the incline shaft	Contamination of groundwater caused by spillage	• A leak/spill detection plan should be devised and implemented for all possible areas of leaks/spillages. • Regular groundwater monitoring from existing and proposed monitoring boreholes will be undertaken to identify any potential contamination of groundwater resources. • Should pollution be identified, the source of the pollutants will be identified and the applicable remediation measures will be implemented.	Construction		
Ground water		Storage of overburden materials and stockpiles	The formation of acid mine drainage (AMD) as a result of ingress water and oxygen into the stockpiled overburden	• Verify AMD generation potential of the overburden only through sampling and analyses of core samples from the incline shaft location. Ensure that all coal and carbonaceous material is removed from the overburden before placement on the stockpile. • Place the overburden on a properly prepared and compacted footprint. • A civil engineering design for leachate control and storm water management must be	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				undertaken and submitted to DWAS for approval.			
Ground water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Seepage from the overburden stockpile can contaminate the groundwater immediately below the stockpile as well as adjacent areas.	• Ensure that the cut-off drains are established and that any surface seepage be contained and diverted to the pollution control dam. • Implementation of the SWMP	Operational		
Ground water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Underground (Lowering of groundwater levels-boreholes)	• Monitor static groundwater levels on a quarterly basis in all boreholes within a zone of one kilometre surrounding the mines to ensure that any deviation of the groundwater flow from the idealised predictions is detected in time and can be reacted on appropriately. • If it can be proven that the mines are indeed affecting the quantity of groundwater available to certain users, the affected parties should be compensated. This may be done through the installation of additional boreholes for water supply purposes, or an alternative water supply. • The numerical model should be done during operation of the mines by using the measured inflows, water	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				levels and drilling and pump test information to re-calibrate and refine the impact prediction.			
Ground water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Underground (Lowering of groundwater levels- baseflow to Olifant's River)		Operational	Groundwater monitoring boreholes should be installed to comply with the minimum requirements as set by governmental guidelines. Monitor static groundwater levels on a quarterly basis in all boreholes within a zone of one kilometre surrounding the mines to ensure that any deviation of the groundwater flow from the idealised predictions is detected in time and can be reacted on appropriately.	

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
						If it is proven that dewatering of the mines is impacting on baseflow, various options should be investigated such as if clean discharge is available to be pumped back into the surrounding streams/rivers/ wetlands. A surface water specialist should be consulted in this regard.	
Ground water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Contamination during mining (sewage, oil spills and mine material)	• Groundwater quality must be monitored on a quarterly basis. • The monitoring results must be interpreted annually by a qualified hydrogeologist and the monitoring network should be audited annually to ensure compliance with regulations. • The numerical groundwater model must be updated by	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				calibrating the model with monitoring data. • Water retention dams should be lined to • prevent ingress of contamination • Geochemical testing of the backfill material and pillar material should be conducted to aid in the prediction of contaminant release and potential geochemical changes induced in the subsurface, by means of geochemical modelling. • Clean and dirty water systems should be separated as planned. • It must be ensured that a credible company removes used oil after vehicle servicing. • A sufficient supply of absorbent fibre should be kept at the site to contain accidental spills • Store all potential sources in secure facilities with appropriate storm water management, ensuring contaminants are not released into the environment.			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Sewage effluent emanating from latrines or ablution blocks should be treated to acceptable levels before discharge into the environment			
Ground water	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	The formation of Acid Mine Drainage (AMD) in groundwater resources	• Optimise storage of mine water make in mined out underground section to minimise exposure to oxygen. • Develop a groundwater monitoring programme in order to assess the groundwater quality. Frequency of monitoring to take place as per the groundwater monitoring plan. • Should pollution be identified within the groundwater resources, the source of the pollutants will be identified and the applicable remediation measures will be implemented.	Operational		
Ground water	Within Infrastructure area	Operation of Sewage treatment plant	Spillages can result in contamination of soils and ground water.	• Spillages to be contained in the Storm Water Management Structures of the Infrastructure area. • All sewage related impact and mitigations to be	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				addressed as part of the water use license application			
Ground water		Closure of the mine	Deterioration of groundwater quality. Leaching/Seeping of contaminants into sub-surface	• A pollution control dam could be used to intercept polluted seepage water. This should be considered if it is found that the Olifant's River or the tributary are indeed negatively affected by pollution. Regular sampling of the streams/rivers/wetlands is essential to decide on this option if needed. • Implement as many closure measures during the operational phase, while conducting appropriate monitoring programmes to demonstrate actual performance of the various management actions during the life of mine. • All mined areas should be flooded as soon as possible to minimise oxygen from reacting with the remaining pyrite. • Mining should remove as much coal as possible from the underground and separate acid forming and non-acid forming material. • Quarterly groundwater sampling must be conducted	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				to establish a database of groundwater quality to assess plume movement trends. • Audit the monitoring network annually. • Geochemical testing of the ROM should be conducted to aid in the prediction of contaminant release and potential geochemical changes induced in the subsurface, by means of geochemical modelling. • Clean and dirty water systems should be separated as planned. • Waste rock dumps and stockpiles can be lined with available compacted clay from the area to minimise infiltration of contamination.			
		Closure of the mine	Decant- Rise of water table	• Treatment of the decant may be viable, however all passive methods should be investigated first during the operational phase of the mine. • Major fractures encountered while mining must be sealed by grouting, both on inflow and outflow areas • A detailed decant management plan will be developed at mine closure.	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				Ultimately water treatment solutions, either passive or active, will be implemented. • Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Treated water will be discharged to the river system.			
		Closure of the mine	Formation of Acid Mine Drainage (AMD)	• An in-depth and detailed geochemical assessment and modelling exercise should be conducted to determine the post closure quality of mine water associated with the both the underground and incline shafts. This will also benefit the Water Use Licence Application still to be undertaken. • Optimise storage of mine water in mined-out underground sections. • Install high pressure seal in the incline underground development to the mined out workings.	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• The shafts will be sealed, backfilled and made free draining. • The underground workings will be left to fill with water to a pre-determined environmental safe level (below decant level) before active water level management is implemented through pumping. • Monitoring of water levels and water quality • The rise of water will be closely monitored to ensure that the environmental safe level is not exceeded and that appropriate extraction works and treatment facilities are constructed in time to treat the surplus water once the environmental safe level is reached. The water will then be actively maintained at or below the environmental safe level. • A detailed decant management plan will be developed at mine closure. Ultimately water treatment solutions, either passive or active, will be implemented.			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Monitoring of the water table rebound will continue post-closure and the modelling updated to quantify the long-term impacts. If necessary, the management measures should be revised based on the modelling results. • Treated water will be discharged to the river system.			
		Closure of the underground mine	Influx of groundwater into the underground workings leading to dewatering of the above lying aquifer	• Ensure stability and integrity of the overlying strata, specifically the weathered zone. • Mine according to the design mine stability safety factor.	Decommissioning		
Visual	Shafts 0.01ha; conveyor route 26km; Infrastructure	Operation of shafts conveyor belt and infrastructure area containing stockpile areas	Potential visual impact on the viewpoints that had a visual exposure rating of 5 or higher. The operational impact on the surrounding agricultural farmers and land users will be more significant, due to the visual intrusion and activities being undertaken. Although the mine activities will not be visible since it will all be underground, the stockpiles, waste rock	The visual impact can be minimized by the creation of a visual barrier. The area will be rehabilitated after mining is concluded and thus the visual impact will be removed, and the area will be restored.	Construction and Operational	Minimum visual impact	Creation of barriers

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
			dumps and related surface infrastructure will be visible for the entire life of mine				
Socio Economic	Shafts 0.01ha; conveyor route 26km; Infrastructure	Construction of the Graspan Mine project	As a result of construction of the shafts, buildings and other mine related infrastructure, supply chain opportunities will be created that could benefit local suppliers	• Procurement of suppliers must be as per the SLP and standards; • Conduct a local skills assessment to ascertain what skills are available that may meet supply chain requirements; • Communication with local suppliers to register on the suppliers list to manage expectations;	Construction	Sustainable opportunities for social and economic growth	Social and community programmes
Socio Economic	N/a	Construction of the Graspan Mine project	Employment at the Colliery	• Targets for the mining operation for BEE spend are set by the Department of Mineral Resources (DMR) in the Mining Charter. Implementation of the SCMP will ensure that local economic benefits are maximised and the social performance of Contractors (local employment, local procurement targets, skills development, etc.) are managed through the CSMP. • Should Contractors not comply with the social management plan that was submitted or the KPIs	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				(breach of contract), the contract may be terminated. • Local employment is once again emphasised and workers that reside closest to the mining area should first be considered for employment. • Establish a labour desk in collaboration with the Ward Councillor and local Municipality to determine the skills that are available locally before considering "outsiders".			
Socio Economic	N/a	Construction of the Graspan Mine project	Impacts on local employment	• Communicate available opportunities at the Graspan Mine Project in advance, to manage employment expectations; • Apply employment/procurement policies and procedures (e.g. do not employ at the mine gate) to prevent unnecessary influx by jobseekers; • The start date of the Graspan Mine Project needs to be communicated to prevent early or long term influx; • Address concerns with and ensure local job and procurement opportunities;	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Ensure compliance with socio-economic tools and legal requirements (BBBEE and Mining Charter);			
Socio Economic	N/a	Construction of the Graspan Mine project	Impacts on local economy Definite positive impacts for the local economy during the construction phase may occur	• Employment of locals and an increase in salary earners; • Contracts with SMMEs and local service • providers; • Local procurement of material and goods, • where possible; • Positive impacts for the retail market (groceries, goods and services, food suppliers, etc.) for local merchants, shops and informal traders; and • Accommodation for temporary skilled employees in local establishments and its associated spin-offs. • It is recommended that a Social Steering • Committee be established to implement the objectives of the CSMP and to address socioeconomic development issues in a more structured manner. • Formulation of a 'Contractor Social Management Plan' (CSMP) and implementation of its requirements for the	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				duration of the construction period to: • Ensure communication between the various sectors that deal with 'social' issues, such as Human Resources (employment), Supply Chain (contractors), Corporate Affairs (communities); • Address concerns with and ensure local job and procurement opportunities; and • Ensure compliance with legal requirements (BBBEE and Mining Charter). • As part of the tender documents the contractor has to provide subcontracting values per package and the plan on how he will meet BEE procurement and SMMEs targets assigned. • Monitor the social performance of contractors and determine how contractors fair on each KPI. • Implement relevant measures should the contractors not comply with the social management plan they submitted (impose penalties, termination where necessary, review of future			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				prospective work and so forth). • Cost of remedial work associated with the social incident is borne by the contractor. • Erect signboards along the R716 that display the timeframe of the construction period.			
Socio Economic	N/a	Construction of the Graspan Mine project	Impact on tourism activities	Construction in winter months or times when tourism is low.	Construction		
Socio Economic	N/a	Construction of the Graspan Mine project	Influx of jobseekers	• Take care not to create unrealistic expectations and communicate accurate details of the construction period to the local communities. Establish a labour desk and ensure that the local Councillor(s) are involved. • Involve the Local Councillor(s) in the process to ensure that they convey the information to the local communities through their established means of communication. • Set guidelines in the CSMP for local employment and ensure implementation thereof for the duration of the construction period.	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• The provision of accommodation for contractors and the erection of a construction camp are not allowed. Each contractor is required to submit his own accommodation and transport plan.			
Socio Economic	N/a		Impacts on the size and structure of the population	• Involve the Local Councillor(s) in the process to ensure that they convey the information to the local communities through their established means of communication (community meetings, etc.). • Set guidelines in the CSMP for local employment and ensure implementation thereof for the duration of the construction period. • The provision of accommodation for contractors and the erection of a construction camp are not allowed. Each contractor is required to submit his own accommodation and transport plan.			
Socio Economic	N/a	Construction of the Graspan Mine project	Disruptions in daily living and movement patterns	• Announce disruptions, road closures (if any) and so forth by using the local media, road sign boards and other Municipal structures and	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				collaborate with the Local Municipality in this regard. • Erect signboards indicating accesses to the construction site. • Impose penalties for reckless drivers to enforce compliance to traffic rules. • Inspect trucks and other heavy vehicles on a regular basis to avoid oil spillages and unroadworthy vehicles that could lead to accidents. • Limit all activities to the development footprint of the proposed construction site. • Fence off the development footprint of the proposed construction site prior to the commencement of site-clearing and construction activities. • Display a contact number on the construction vehicles where motorists can report reckless driving. • The mine to consult with adjacent landowners whose private residences, crops, livestock and other infrastructure could be affected by dust, noise and other impacts that result from traffic movement.			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				Provide a schedule of the construction activities to landowners and relevant I&APs. • Keep the local SAPS in Komati and Ward Councillors informed about the construction progress and time-lines to ensure that they would be able to adequately deal with any type of disruptive behaviour.			
Socio Economic	N/a	Construction of the Graspan Mine project	Security impacts	• Provide workers with identity tags and prohibit the access of unauthorized people to the construction site. • Workers should not be allowed to remain in the construction area when they are off duty. • Implement safety and security measures, such as fencing, 24-hour security guards, CCTV cameras, random security checks and access control.	Construction		
Socio Economic	N/a	Construction of the Graspan Mine project	Impacts on road infrastructure	Communicate with the local Municipality with regards to potholes and possible repairs to the road surfaces that might be required.	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Socio Economic	N/a	Construction of the Graspan Mine project	Disruptions of services (water/electricity/sewer age	• Inform surrounding landowners and other • affected parties in advance of possible service interruptions and restore the service as soon as possible. • Ensure that surrounding landowners and residents are aware of procedures to raise complaints and make the contact numbers of the Main Contractor available to them, should issues arise.	Construction		
Socio Economic	N/a	Construction of the Graspan Mine project	Health and safety risks for workers	• Address complaints speedily. • Implement measures to suppress dust - spraying of gravel roads, surfaces and stockpiles with water on a regular basis. • Construction workers to wear protective clothing (e.g. masks that minimize dust inhalation and clothing that protects against sunburn). • Enforce the use of earplugs where relevant. • Lock away dangerous plant, equipment and material when not supervised or in use. • Dispose of the various types of waste generated in the appropriate manner at	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				licensed waste fill sites at regular intervals. • Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated. • Provide enough ablution facilities (chemical/portable toilets, etc.) at strategic locations that are cleaned regularly. • Keep the local police and ambulance services informed of construction times and progress. • Ensure that the Colliery has an ambulance that remains on stand-by for the duration of the project. • Store any materials away from sensitive locations in fenced-off areas. • Accommodation and facilities of security guards and any other personnel that may stay on site should comply with health and safety standards. • Inform the Municipality and emergency services if harmful substances are spilled. • Erect a safety fence around the shaft complex and construct relevant			

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				reinforcements to ensure slope stability. • Utilise and increase existing mine security and procedures and 24-hour security in and around the mining area. • Fence off the construction site where possible to avoid illegal trespassing. Close off any excavation areas to prevent access.			
Socio Economic	N/a	Construction of the Graspan Mine project	Community health and safety	• Identifiable tags and clothing for construction workers and the implementation of security measures at the entrance to the construction site. • Designate a suitable area for cooking fires (if required). • Display “danger” warning signs and “no public access” signs at all potential accesses and paths. • Adhere to the Emergency and Safety plan procedures for the duration of the construction phase. • Make the procedure to lodge complaints available to the surrounding property owners and Ward Councillors to enable them to lodge complaints when problems with regards to	Construction		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				community and/or environmental health arise. • Heavy vehicles to keep headlights always switched on to improve visibility. • Inspect vehicles on a regular basis and impose penalties for reckless driving. • Implement all mitigation measures as proposed in the Specialist Noise and Air Pollution Assessment Reports. • Ensure good visibility at the accesses to the site.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Employment at the mine	• Targets for the mining operation for BEE spend are set by the Department of Mineral Resources (DMR) in the Mining Charter. • Implementation of the SCMP will ensure that local economic benefits are maximised and the social performance of Contractors (local employment, local procurement targets, skills development, etc.) are managed through the CSMP. • Should Contractors not comply with the social management plan that was submitted or the KPIs (breach of contract), the contract may be terminated.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Local employment is once again emphasised and workers that reside closest to the mining area should first be considered for employment. • Establish a labour desk in collaboration with the Ward Councillor and local Municipality to determine the skills that are available locally before considering "outsiders".			
Socio Economic	N/a	Operation of Graspan Mine general	Impacts on procurement / supporting industries / local SMMEs	Establish a labour desk in collaboration with the Ward Councillor and local Municipality to determine the skills that are available locally before considering "outsiders".	Operational		
Socio Economic	N/a	Operation in the Graspan Mine in general	Impacts on current NON-MINING RELATED employment levels of the area	• Implement the 'Groundwater Management Strategy' and any recommendation made as part of the Geohydrological Report. • Test boreholes on all affected private properties at regular intervals, make the results known to the property owners and keep record of test results. • represented by landowners, the mine operator and independent specialists and	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				conduct quarterly meetings where issues relating to the environment and water pollution can be discussed.			
Socio Economic	N/a	Operation of Graspan Mine general	Impacts on land values / market values of affected land portions	• Should boreholes be affected, implementing an Action Plan that will ensure that clean water (on-tap) is available to all the affected landowners without disruptions. • Ensure that all affected landowners are familiar with the procedure to lodge complaints and attend to the issues at hand expediently. Update affected landowners of new developments and attempt to communicate with them directly by minimising the use of Consultants for this purpose • Monitoring programmes for groundwater need to be implemented and if ground water quality or quantity is affected, water will need to be supplies by the mine for use by users affected.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on tourism activities	No tourism will be affected as the area is far from tourism activities.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Socio Economic	N/a	Operation of the Graspan Mine in general	Skills development, training and skills equity	• Do a skills analysis of the local community members in collaboration with the local Municipality and Ward Councillor to ensure that locals are considered for employment and training. • Take locals from Davel, Ermelo, Hendrina and settlements close to the project site into consideration for all potential training opportunities. Engage continuously with all stakeholders on employment and training opportunities should they arise. This will also form part of the overall Graspan mine Stakeholder Engagement Plan', SLP and the 'Socio-economic Assessment Tool', which will be managed by Graspan Mine. • Legislation stipulates that specific levels of training and skills are required to work for a mine. Only if skills are not available locally (nearby settlements and local Municipal area) will personnel be sourced elsewhere.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Socio Economic	N/a	Operation of the Graspan Mine project in general	Impacts on the local community / community projects	• As part of a mine's Social and Economic Development responsibility, the mine must get involved with a relevant Local Economic Development Projects as identified in the IDP of a municipality. • Graspan Mine project is however not in the position to get involved with the day-to-day running of a LED project, but will make a financial contribution of approximately R1 000 000 annually towards a project of the municipality's choice, over a period of 5 years. Set aside a Corporate Social Investment (CSI) budget for smaller ad-hoc community requested projects should individual community members require funding/loans to start-up small businesses, etc.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts of an 'outside' workforce / migrant labourers	• Graspan Mine project must commit to work with the Ward Councillors and Local Municipality to establish the skills database and to set up a labour desk to source local workers as far as possible.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Only if skills are not available locally should outsiders be considered. • Define the definition of a "local workforce" and communicate this and the skills requirements to the local communities. Work with the local • Municipality and Councillors to ensure that no unrealistic job expectations are created.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on the size and structure of the local Municipal area	The potential impact on population changes (size and structure of the local Municipality) is regarded as insignificant.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts associated with blasting	• The potential impact of blasting activities on community infrastructure is rated as insignificant as it is unlikely to occur. • Should blasting take place, inform landowners of the blasting schedule and limit blasting to daytime hours. Undertake a full risk assessment in order to address the aspects and to put proper controls in place	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on road infrastructure	• The potential impact on road surfaces is deemed to be insignificant, although it may still occur.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Inform the Municipality of damage to road surfaces and potholes			
Socio Economic	N/a	Operation of the Graspan Mine in general	Attitude formation and mobilization against the project (private landowners	• Ensure that landowners and affected communities are continuously updated with regards to new developments that might affect them. • Use a single line of communication and make the communication channels known to the affected parties, in case they want to raise complaints or make enquiries. • reported, especially issues that relate to the environment, water and issues that could affect the 'sense of place'	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Attitude formation for or against the project (local communities)	• Be aware not to raise unrealistic expectations amongst the local communities with regards to employment, skills requirements and new community projects. • Encourage the local communities to do a skills analysis of their available workforce and train and employ locals wherever possible.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Continuously engage with the local communities and provide updates through the Councillors and other structures with regards to the implementation of SLP projects and targets. Make the annual SLP progress reports available for public scrutiny if required.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Disruptions in daily living and movement patterns	• If a conveyor belt is used to transport the coal to nearest rail-siding, the potential impact on living and movement patterns are regarded as low. • Announce disruptions, road closures and so forth by using the local media, road sign boards and other Municipal structures. • to enforce compliance to traffic rules and speed limits. This is particularly pertinent for trucks and other vehicles that travel on the roads near sensitive receptors (farm houses, local businesses, communities, etc.). • Inspect trucks and other heavy vehicles on a regular basis to avoid oil spillages and un- roadworthy vehicles that could result in accidents.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Where relevant install silencers on machinery and trucks. • Limit operations and the movement of trucks on the access and haul roads to reasonable daytime hours and not on Sundays and public holidays. • Display a contact number on trucks where motorists can report reckless driving. • The mine to consult with adjacent and other affected landowners whose private residences, crops and other infrastructure could be affected by dust, noise, blasting and other impacts that result from traffic movement and the mining activities.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts of the conveyor belt	• Fencing of the mining area and the conveyor belt. • Erect signboards that warn of the dangers of the conveyor belt and indicate areas that are off limits for the public.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Relocation of individuals and families	The mine to consult with adjacent and other affected landowners whose private residences, crops and other infrastructure could be affected	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				by dust, noise, blasting and other impacts that result from traffic movement and the mining activities.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Illegal trespassing	• Implement and increase security measures to address the unauthorized movement of cattle and trespassers. • Fencing of the mining area and the conveyor belt.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Security impacts	• Should crime escalate and unacceptable levels of crime and safety-related issues occur during the operational phase, collaborate with the Ward Councillors and SAPS and compile an action plan that would address the implementation of additional and stricter security measures. • Establish a channel where incidences of illegal trespassing and the occurrence of illegal settlements can be reported as soon as it occurs.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on the 'sense of place'	A Geo-hydrological Assessment is being done to establish potential ground and surface water pollution. Implement all mitigation and management measures as proposed in the Specialist Report and implement	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				a 'Groundwater Management Strategy'.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on land and land use changes	• Keep the development footprint and areas necessary for the optimal operation of the mine as small as practically possible. • Restrict vehicle movement over unprotected or sensitive areas.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on agricultural practices	Make procedures to lodge complaints available to private landowners. Prompt landowners to make use of these channels, maintain open communication, attend to issues as soon as possible and provide feedback on a regular basis. Implement all the mitigation and management measures as proposed by the Geohydrologist as the availability and quality of groundwater and the protection of surface water would mitigate land use impacts to a large extent.	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Impacts on future land developments	Communication and future consultation with land developers especially Willow Creek	Operational		
Socio Economic	N/a	Operation of the Graspan Mine in general	Land claims	Verify land claims that transpire during the process with the Regional Land Claims	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				Commissioner and include the rightful claimants in the consultation process.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Health and safety risks for workers	• Dust monitoring at the underground workings and implement enough dust suppression. • Employees are provided with dust masks that minimize dust inhalation. • Issue employees with earplugs and instructions how to use it. • Ensure all vehicles and machinery is serviced regularly and enforce speed limits on site. • Provide safe and clean drinking water and instil regular water breaks to keep workers hydrated. • Implement awareness campaigns (HIV/AIDS/TB, blood pressure, Body Mass Index, Fatigue management, overall emphasis on healthy lifestyle, chronic disease management and wellness) to improve knowledge in the workplace and in the surrounding communities, provision of home-based care and counselling and educating the people at schools and in the	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				community about the pandemic.			
Socio Economic	N/a	Operation of the Graspan Mine in general	Community health and safety risks	• Dust suppression and monitoring is conducted on the gravel roads, mine processing plant, stockpile areas, etc. • Strict monitoring of ambient air quality and open communication to all stakeholders. • Limit the number of access gates and ensure 24-hour security and other relevant security measures. • Fence and prevent access to mining areas, borrow pits, conveyor, etc. where safety hazards could occur. • Stability of pillars in workings to be monitored. • Post information boards about public safety hazards and emergency contact information. • Fire breaks to prevent the spreading of veld fires, should it occur. • Ensure that the personnel on site are trained in first aid and procedures to follow in case of fire breakouts and other emergency situations.	Operational		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
				• Procedures set out in the mine's Emergency Response Manual to be followed, such as emergency response drills carried out throughout the year and regular auditing and questioning of the key personnel involved in emergency responses.			
Socio Economic	N/a	Closure of the underground mine	Loss of employment due to closure of mine	• Counselling and assistance is provided, in collaboration with the workers and union representatives, to workers to overcome shock and distress of being retrenched and assistance is necessary in obtaining other employment and manage retrenchment packages. • If possible at the time of closure, those workers who do not qualify for early retirement, will be redeployed in other ventures owned by the owners should they wish to continue their employment with the owners. The owners are involved within various sectors of the economy where workers with these specific skill sets can easily be redeployed.	Decommissioning		

Environmental aspect	Size and scale	Activity	Potential impact	Mitigation type	Phase	Standards to be achieved	Compliance with standards
Topography	N/a	Rehabilitation	Subsidence of the rehabilitated area will cause ponding that will cause an increase in the recharge into the mined-out workings	• Ensure that the profile of the rehabilitated area is free-draining and establish a slope like the pre-mining slope. Establish vegetation as soon as possible and inspect the areas for possible subsidence areas. Once the subsidence occurs re-grade and fill the area to ensure free draining. • Proper rehabilitation can restore topography to pre-mining conditions as close as possible.	Decommissioning	Stop subsidence	Correct mining method Corrects rehabilitation Implement rehabilitation

2 IMAGE MANAGEMENT OUTCOMES

Description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated.

This is presented in Table 41 section.

3 IMPACT MANAGEMENT ACTIONS

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

This is presented in Table Section.

4 FINANCIAL PROVISION

4.1 Determination of the amount of financial provision

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

The closure objectives for mining internationally and in South Africa focuses on the restoration of previous land use capabilities, the zero-net loss of biodiversity, and the satisfaction of community requirements.

Project closure objectives for Graspan Mine will be in line with the above mentioned and is as follows:

- Re-establishment of the pre mining land use and land capability
- Re-establishment of function to any biodiversity areas of concern that could and have been affected by the mining operations
- Prevent any form of contamination of soils, surface water and ground water.
- Implementation of on-going rehabilitation to regulated standards
- Implementation of sustainable community projects that will be self-driven after mine closure.
- Maintenance and Monitoring of rehabilitated areas.

4.2 Confirm that environmental objectives in relation to closure have been discussed with landowner and I&APs

The environmental objectives are being made in line with the concerns raised by Interested and Affected parties. The stakeholder and Public participation consultation is still on-going and transparent. The EIA report for public view included the Closure objectives, specialist study findings and financial provision for

scrutiny. It has been discussed with the lawful lease agreement holders that the Surface mining activities (Box cut) that will take place in Graspan 222 IS, Potion 10 will only affect 34.35ha of portion 10, whereby the remaining extent (341.47ha) will be mined with underground mining method, which in turn will work hand in hand with the agricultural activities. Surface mining will be rehabilitated and once all procedures are done the land will be suitable for agricultural activities to take place again. where mining activity will be occurring underground, the agricultural activities will continue without any hindering effects.

4.3 Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, the anticipated mining area at the time of closure

A detailed Rehabilitation plan is attached as specialist studies on appendix 20.

4.4 Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives

The rehabilitation plan is designed to comply with the requirements of the closure objectives.

4.5 Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline

The Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine, Department of Minerals and Energy, 2005) was referred to. The revised version of 2019 quantum was used as per DMR guidelines. A calculated quantum is provided in appendix 9.

4.6 Confirm that the financial provision will be provided as determined

Increadable Barachot Mining and Traders (Pty) Ltd is a black owned company from historical disadvantaged background and does not have enough capital, however they are requesting to pay 50% of the required guarantee payment (R8 718 254.00) and the remaining balance to be paid within 6 months of production. Financial provision is included in appendix 9.

4.7 Mechanisms for monitoring

Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including:

4.7.1 Monitoring of impact management actions

The mine will implement an ongoing monitoring programme for its proposed operations as recommended, ensuring environmental requirements stipulated in this EMPr are complied with. Various monitoring mechanisms have been suggested and included in specialist studies and revolves around Ground water, Air quality and Noise.

4.7.2 Monitoring and reporting frequency

Enclosed on table 42 section.

4.7.3 Responsible persons

An Environmental Control Officer will be responsible for ensuring that all necessary environmental monitoring required for the Graspan Mine project is undertaken as per the monitoring programmes.

4.7.4 Time period for implementing management actions

Impact Management will be undertaken in each respective phase in which it would be applicable. In terms of monitoring, each management action will be implemented.

4.7.5 Mechanism for monitoring compliance

Monitoring programmes are enclosed in table 42 and will be implemented accordingly.

Table 42: Aspect Monitoring and Monitoring Plan

SURFACE MONITORING ASPECTS AND PLAN				
Monitoring Aspect	**Role**	**Responsibility**	**Time Frames**	**Reporting**
Dust Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMP Compliance to be monitored by the Environmental Control Officer	- Control the liberation of dust into surrounding environment by the use of inter alia, water spraying and / or other dust allaying agents - Limit speed on the access roads to 30 km/h to prevent the generation of excess dust. - Spray roads with water or an environmentally friendly dust allaying agent that contains no PCB's (e.g. DAS products) if dust is generated above acceptable limits. - Assess effectiveness of dust suppression equipment.	Throughout Construction, Operational and Decommissioning Phase	• Daily compliance monitoring by site management Quarterly compliance monitoring of site by an Environmental Control Officer

		- Re-vegetate all disturbed or exposed areas as soon as possible to prevent any dust source from being created. - Thoroughly soak all stockpiles to ensure dust suppression on the site.		
Noise Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Ensure that employees and staff conduct themselves in an acceptable manner while on site. - Ensure that all mining vehicles are equipped with silencers and maintained in a road worthy condition in terms of the Road Transport Act.	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer
Management of weed/invader plants	Site Manager to ensure compliance with the guidelines as stipulated in the EMP.	- Implement a weed and invader plant control management plan. - Control declared invader or exotic species on the rehabilitated areas.	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer

	Compliance to be monitored by the Environmental Control Officer	- Keep the temporary topsoil stockpiles free of weeds		
Storm water Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Divert storm water around the topsoil heaps, stockpile areas and access roads to prevent erosion and loss of material - Divert runoff water around the stockpile areas with trenches and contour structures to prevent erosion of the work areas. - Conduct mining in accordance with the Best Practice Guideline for small scale mining that relates to storm water management, erosion and sediment control and waste management, developed by the Department of Water Affairs, and any	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer

		other conditions which that department may impose.		
Management of health and safety risks	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Ensure that workers have access to the correct PPE as required by law. - All operations to adhere to the Occupational Health and Safety Act	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer
Waste management	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Ensure that vehicle repairs only take place at the off-site - Collect any effluents containing oil, grease or other industrial substances in a suitable receptacle and removed from the site, either for resale or for appropriate disposal at a recognized facility - Clean spills immediately to the satisfaction of the	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer

		Regional Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility - Always ensure the availability of suitable covered receptacles and conveniently placed for the disposal of waste - Store non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., in a container with a closable lid at a collecting point. Collection should take place on a regular basis and disposed of at the recognized landfill site Ermelo. Prevent refuse from being dumped on or in the vicinity of the mine area.		

		- Biodegradable refuse to be handled as indicated above.		
Management of access roads	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Maintain newly constructed access roads to minimize dust, erosion or undue surface damage. - Divert storm water around the access roads to prevent erosion. - Erosion of access road: Restrict vehicular movement to existing access routes to prevent crisscrossing of tracks through undisturbed areas	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer
Topsoil Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Remove the first 300mm of topsoil in strips and store at the stockpile area. - Keep the temporary topsoil stockpiles free of weeds. - Place topsoil stockpiles on a levelled area and implement measures to safeguard the piles from being washed away in the	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer

		event of heavy rains/storm water. - Topsoil heaps should not exceed 2m in order to preserve micro-organisms within the topsoil, which can be lost due to compaction and lack of oxygen. - Divert storm and runoff water around the stockpile area and access roads to prevent erosion.		
Surface Water Monitoring	Site Manager to ensure compliance with the guidelines as stipulated in the EMP. Compliance to be monitored by the Environmental Control Officer	- Conduct quarterly water analysis when water is present in the stream bordering the site.	Throughout Construction, Operational and Decommissioning Phase	- Daily compliance monitoring by site management - Quarterly compliance monitoring of site by an Environmental Control Officer

UNDERGROUND MONITORING ASPECTS AND PLAN				
Source activity	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities **(for the execution of the monitoring programmes)**	Monitoring and reporting frequency and time periods for implementing impact management actions
Underground mining	• Contamination of underground water resources • The formation of AMD in groundwater resources • Dewatering of ground water	• Underground water sampling and analysis • Pump testing	• Environmental Control Officer on the mine-internal • Environmental officer – external audits	• Baseline hydro census before mining. • Quarterly initial monitoring after mining commences • Bi- Annual monitoring after initial monitoring year. • Any impacts detected needs to be managed immediately.
Underground mining	• Pollution of surface water resources(two identified pans)	• Surface water sampling of all surface water bodies, upstream and downstream	• Environmental Control officer on the mine-internal • Environmental officer – external audits	• Quarterly initial monitoring after mining commences • Bi- Annual monitoring after initial monitoring year. • Any impacts detected needs to be managed immediately.
Operation of Surface Mining , stockpiles, conveyors and general mine function	• Dust fallout • Presence of PM10 particle dust	• Dust buckets sampling, monitoring and analysis	• Environmental Control officer on the mine-internal • Air quality specialist • Environmental officer – external audits	• Monthly monitoring and reporting. • Management actions to be implemented immediately. • Management actions will be applicable for all phases of the Project.
Operation of Surface mining, stockpiles, conveyors and general mine function	• Noise	• Noise readings undertaken with a handheld monitoring device will be required.	• Environmental Control officer on the mine-internal. • Noise specialist. • Environmental Control officer – external audits.	• Baseline monitoring • Monthly noise monitoring in the Construction phase • Monthly monitoring for the first year of operation • Quarterly monitoring after the first year of operation • Noise levels to be mitigated as far AS POSSIBLE
Closure and Rehabilitation	• Ground water, surface water, air and noise, social	• On-going monitoring	• Environmental Control officer on the mine-internal. • Environmental Control officer – external audits • Rehabilitation / financial auditors	• Monthly

5 FREQUENCY OF THE PERFORMANCE ASSESSMENT REPORT SUBMISSION

The EMPr performance assessment (audit) must be undertaken every year by an external auditor, and a report must be compiled and submitted to the competent authority every two years. Operational internal environmental inspections will need to be done once a month by the mine's Environmental personnel. A yearly internal audit needs to be undertaken by the mines environmental department.

6 ENVIRONMENTAL AWARENESS PLAN

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

6.1 Employee communication

It is recommended that the contractor will inform employees of any environmental risks which may result from their work by compiling a risk assessment and discussing this at regular training sessions (including basic environmental awareness training at induction).

6.2 Environmental awareness plan as a solution to risks

It is recommended that an Environmental Awareness Plan is to be compile that describes how potential environmental pollution and degradation can be avoided by dealing with potential environmental risk. This Environmental Awareness Plan will be provided on site and discussed with the employees at regular training sessions (including basic environmental awareness training at induction).

6.3 Environmental awareness training

The Environmental Control Officer (ECO) shall be responsible for compiling and Environmental Awareness Training Programme for all staff members that aims at explaining the mitigation measures described in this report. Before commencing with any work, all staff members shall attend the Environmental Awareness Training Programme. After attending the programme, all contractors and subcontractors shall sign an Environmental Training register as proof of their training; which shall be kept as proof for auditing purposes.

The environmental training should, as a minimum, include (but not be limited to) the following:

- The importance of conformance with all environmental policies;
- The environmental impacts, actual or potential, of the proposed activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with this EMP, including associated procedures and emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures; and
- The mitigation measures required to be implemented when carrying out their work activities
- SHE induction and awareness training;
- An Environmental Management Systems (EMS) coordinator has been appointed;
- General Awareness Training.

6.4 Manner in which risks will be dealt with to avoid pollution or environmental degradation

The environmental management programme and associated management options are intended to minimise environmental risk as far as possible. Should, however, circumstances lead to unacceptable risks, emergency systems and procedures have been designed and will be implemented in the case of an emergency to prevent or minimise the consequential environmental damage. The environmental emergency contingency plan addresses any reasonably anticipated failure (most probable risk) for the entire mining area and focuses on incidents that could cause environmental emergencies. The most crucial aspect of the emergency system is the identification and communication of the emergency to the appropriate persons. Consequently, the names of the appropriate contact person together with their contact numbers would be prominently displayed around the facility. The contact details will be updated on a regular basis.

6.5 Specific information required by the competent authority

Financial provision has been compiled for Graspan Mine Project. This provision will be reviewed annually for adequacy and amended to compensate for new activities and/or inflation.

6.6 Undertaking

The EAP herewith confirms:

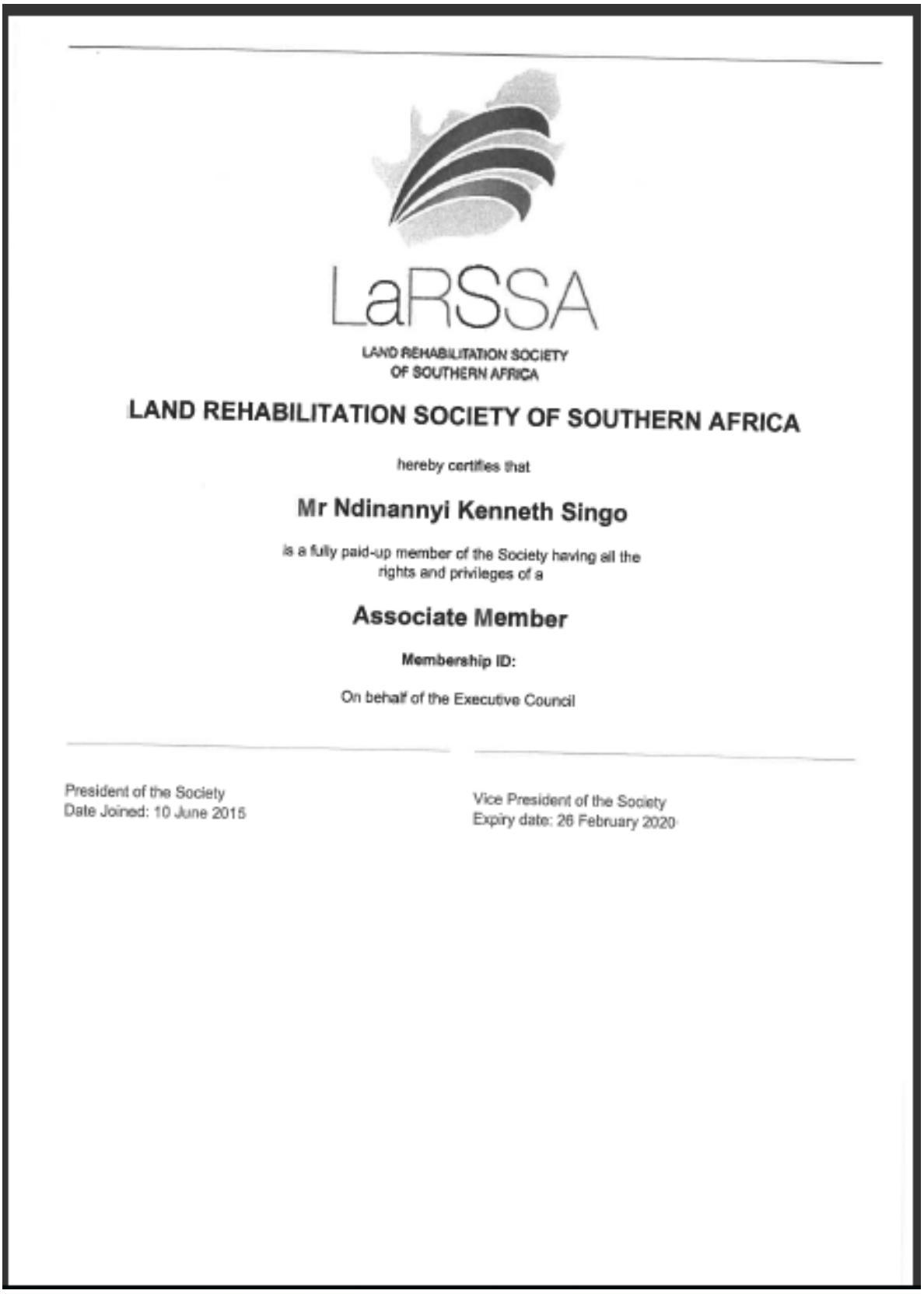
- the correctness of the information provided in the reports
- the inclusion of comments and inputs from stakeholders and I&APs
- the inclusion of inputs and recommendations from the specialist reports where relevant
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed

Signature of the EAP

Date: 30-09-2019

APPENDICES

Appendix 1: Qualifications of the EAP



LaRSSA

LAND REHABILITATION SOCIETY
OF SOUTHERN AFRICA

LAND REHABILITATION SOCIETY OF SOUTHERN AFRICA

hereby certifies that

Mr Ndinannyi Kenneth Singo

is a fully paid-up member of the Society having all the rights and privileges of a

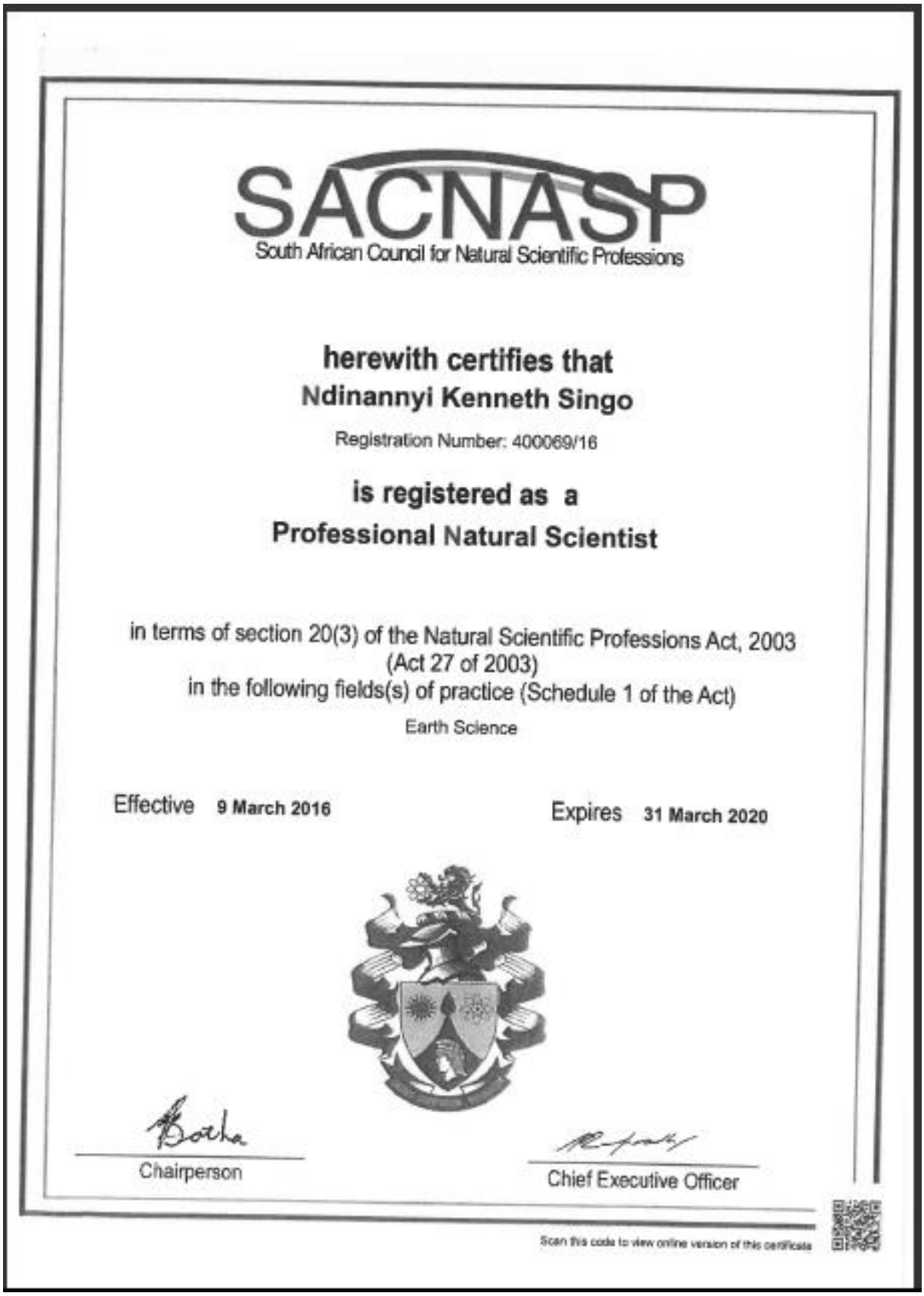
Associate Member

Membership ID:

On behalf of the Executive Council

President of the Society
Date Joined: 10 June 2015

Vice President of the Society
Expiry date: 26 February 2020



SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Ndinannyi Kenneth Singo

Registration Number: 400069/16

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following fields(s) of practice (Schedule 1 of the Act)

Earth Science

Effective **9 March 2016** Expires **31 March 2020**

Chairperson

Chief Executive Officer

Scan this code to view online version of this certificate

UNISA
UNIVERSITY OF SOUTH AFRICA

We certify that

NDINANNYI KENNETH SINGO

having complied with the requirements of the Higher Education Act and the Institutional Statute, was admitted to the degree of

MASTER OF SCIENCE
in Environmental Management

at a congregation of the University on 14 October 2013

06/03/19

Vice-Chancellor

Executive Dean

University Registrar

University of Venda

This is to Certify that the Degree of

Bachelor of Earth Sciences in Mining and Environmental Geology

was Awarded to

SINGO NDINANNYI KENNETH

at a Ceremony held on the

07-MAY-2009

in Accordance with the Provisions of the Act and Statute

06/03/19

Vice Chancellor

University Registrar

Dean

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Ndinannyi Kenneth Singo

Registration number: 400069/16

is registered as a

Professional Natural Scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003 (Act 27 of 2003) in the following field(s) of practice (Schedule I of the Act)

Earth Science **09 March 2016**

06/03/19

09 March 2016 — Pretoria

President

Executive Director

Appendix 2: Curriculum Vitae of the EAP

NDINANNYI KENNETH SINGO

10 Khayalami Estates, 1 Impala Street, Tasbet Park Ext 11, Witbank, 1040, Mpumalanga Province, South Africa

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singo.kenneth@gmail.com & kenneth@singoconsulting.co.za

PERSONAL PROFILE

First Names	:	Ndinannyi Kenneth
Surname	:	Singo
Date of Birth	:	8 August 1986
Identity Number	:	860808 5525 089
Nationality	:	South African
Home Language	:	Tshivenda
Other Languages	:	English (SA), Tsonga (SA), isiZulu (SA), Shona (Zim)
Driver's Licence	:	Valid Code 10 (C1)
Passport	:	Valid RSA Passport
Membership of Professional Societies	:	South African Council for Natural Scientist **SACNASP** (Pr.Sci.Nat. 400069/16), Land Rehabilitation Society of Southern Africa (**LaRSSA**) (Associate Member), South African affiliates of the International Association for Impact Assessment (**IAIAsa**), Geological Society of South Africa (**GSSA**) (Member, Reg No. 967334),
Marital Status	:	Married
Dependants	:	2
Gender	:	Male
Disability	:	None

EDUCATIONAL QUALIFICATIONS

SECONDARY EDUCATION

School Attended	:	Thengwe High School
Highest Grade Passed	:	Grade 12 (Maths and Science)
Year in which Highest Grade was passed	:	2004 (Merit)

TERTIARY EDUCATION

Qualification	:	**Ph.D.** (Geology, Applied Environmental Mineralogy & Geochemistry)
Institution	:	University of Johannesburg
Year Obtained	:	In progress (Final Year, submitted in January 2018)
PhD Project Title	:	In Search of the Possible Economic Potential, through Conceptual Study, on Reclamation of Defunct Mine Residue areas for Development Purposes: Case study of Musina Copper Mine, Giyani Louis Moore Gold Mine and Zwigodini Nyala Magnesite Mine, South Africa
Qualification	:	**M.Sc.** (Environmental Management)
Institution	:	University of South Africa
Year Obtained	:	2013
Masters Project Title	:	An Assessment of Heavy Metal Pollution in the Vicinity of the Defunct Copper Mine Dumps in Musina, South Africa
Qualification	:	**B.Sc.** (Hons) Mining & Environmental Geology
Institution	:	University of Venda
Year Obtained	:	2008
Honours Project Title	:	Structural Control on Kimberlite Pipes: A Case Study of Venetia Kimberlite

Pipe-K19, Venetia Open Cast Diamond Mine, South Africa

WORK EXPERIENCE

Company	:	Singo Consulting
Position	:	Director
Duration	:	9 August 2012----
Key Focus Area	:	Environmental Projects

I, Ndinannyi Kenneth Singo, am a Professional Earth Scientist (Incl. Geologist, Environmentalist and Mining Specialist), Director and Principal Consultant at Singo Consulting (South Africa) Limited.

Technical work:

- Environmental Impact Assessment
- Environmental Management Plans
- Social and Community Development Plans
- Geological (Exploration, Resource Estimation and Competency Report)
- Hydrological and Hydrology (Surface and Groundwater Studies)
- Soil Science (Soil profiling, Modelling and Soil Chemistry)
- Geotechnical (Soil and Rock)
- Mining Feasibility Studies

Company	:	Anglo American Coal (South Africa)
Position	:	Exploration Geologist (Subordinate Manager 2.6.1)
Duration	:	8 May 2014 to 12 June 2018
Key Focus Area	:	In Exploration and Collieries (Mine) Drilling

HSE:

Effectively applying all of the safety tools in exploration e.g. VFLs, SLAMS, SIs, SRMP and SLP courses, induction and safety meetings. Monitoring and managing environmental aspects and impacts (waste, dust pollution, greenhouse gasses and land disturbances). Ensure the continuous implementation of the rehabilitation programme during exploration. Conducting coaching sessions to ensure that all drill crews are actively involved and participate in the HPH hunting mode.

OPERATIONAL:

Delivering high-standard exploration programmes within budget and on time. Conduct audits using the latest technical standards and procedures in geology. Ensure that Exploration plans/technical packs are prepared before drilling. Ensure that

close-out reports are available on completion of projects. Designing and implementing Quality Assurance and Quality Control (QAQC) procedures for key areas such as wireline logging, core logging, laboratory, etc.

COST CONTROL:

Maintain good cost control through responsible budgeting, tracking, forecasting and reconciling of expenditure. Reviewing costs on a minimum of a monthly basis. Identifying and implementing opportunities for cost savings.

EXPLORATION & LIFEX PROJECT:

Elders, Alexander (EUX and Kriel East), Sethlabotsha (Standerton), Mafube Lifex & Colliery, Kriel Colliery, New Denmark Colliery, Greenside Seam 4 Project and Goodehoop (Hope 4 seam).

LAND TENURE AND LEGAL COMPLIANCE:

Understanding and complying with all Prospecting Rights requirements/commitments with regard to exploration. Ensure all responsibilities relating to legal appointments are adhered to. Report on a monthly basis to the exploration superintendent.

Company	:	Anglo American Thermal Coal, eMalahleni
Position	:	Senior Geologist (Projects)
Duration	:	7 Feb 2012 to 7 May 2014
Key Focus Area	:	In Exploration and Collieries (Mine) Drilling

GEOLOGY:

Assisting the exploration manager in developing a strategy to maximise Anglo Coal exploration tenements into operational, planning and prioritising strict budgets, preparing work scope for exploration work, overseeing contractors, ensuring the input of data, creating and assessing geological models, producing geological and other technical documents as a requirement for all aspect of mineral exploration. Assist the Project Geologists in core logging, sampling and rock sampling.

HSE:

Act as safety representative for Geological Services (Standerton camp), conducting Visible Felt Leadership, Safety and Environmental Inspections at the drill site and holding the safety talks and meetings with the contractor. Submit weekly reports to the HSE officer on site HSE compliance to OHSAS 18001 and ISO 14000. Audit safety, health and environment in conjunction with the Anglo American HSE audit system, as well as policies and procedures. Report on a monthly basis to the Geology Manager (Projects).

Previous Company	:	Ncondezi Coal Company, Mozambique
Previous Position	:	Leading Project Geologist
Duration	:	1 May 2011 to 4 Feb 2012
Key Focus Area	:	Pre-Feasibility Study Exploration

GEOLOGY:

Assist the Project Geologists in core logging, sampling, field mapping and soil/rock sampling, Packaging all samples and labelling all samples to be sent to the labs for contractors. Compile sample dispatch sheets. Analysing and interpreting lab results. Conducting geophysical interpretations and supervising project geologists, technicians, field assistants and contractors. Ensure quality of work.

HSE:

Perform compliance inspections on Health and Safety at the drill sites. Train new recruits nationally. Submit monthly reports to the Project Chief Geologist.

Previous Company	:	Malatleng Mining cc (Geocoal Consulting Services), Waterberg
Position	:	Exploration Geologist
Duration	:	5 Jan 2009 to 30 April 2011
Key Focus Area	:	Ensure Australian core logging standards are adhered to. Conduct chip and core logging and geophysical interpretation. Supervising drill crews and conducting geotechnical marking and logging on site. Ensuring that drill core and other samples are maintained and adequately stored in cooler rooms. Dispatch samples to the labs. Report directly to the Managing Director.

PROJECT EXPERIENCE AT MALATLENG MINING CC-Geocoal Consulting Services (SOUTH AFRICA)

Coal Prospecting	Client	Duration	Duties	Position
Manchester, Billiton and White Haven Farms	BHP Energy Coal SA (Waterberg Coalfield)	Jan 2009 – Jan 2010	Drilling supervision, logging, sampling, supervising rehabilitation	Entry-level Geologist and Site Environmental Analyst
Kalkpan, Draai Om, White Haven	Resource Generation (Waterberg Coalfield)	Jan 2010 – Mar 2010	Same as above	Same as above

Verloren Valley and Duiker pan	CI Holdings (Waterberg Coalfield)	Dec 2009 – May 2010	Same as above	Same as above
Zeekoey vlei	Resource Generation (Waterberg Coalfield)	April 2010 – May 2010	Same as above	Same as above
Kleinberg	CI Holdings (Waterberg Coalfield)	April 2010 – June 2010	Same as above	Same as above
Ferskraal, Doppie and Hertty	CI Holdings (Soutpansberg Coalfield)	June 2010 – August 2010	Same as above	Project Geologist/Site Environmental Analyst
Eendrachdt	Umbono Capital Ltd Pty (Waterberg Coalfield)	Sept 2010 – Oct 2010	Same as above	Project Geologist

Company	:	De Beers Group SA, Venetia Open Cast Diamond Mine (Musina)
Temporary Position	:	Trainee Mine Geologist (Open Cast)
Area of Exposure	:	Venetia Mine Extension Exploration Project: Conduct core-logging and sampling. Drill rigs supervision and management. Ensure timely and accurate project reporting. Assist with safety management, open cast ore extraction and waste loading supervision.
Duration	:	9 Nov 2006 to 29 Dec 2007 (4 months, during university holidays)

Company	:	De Beers Group SA, Exploration Corporate Office (Johannesburg)
Temporary Position	:	Trainee Exploration Geologist
Area of Exposure	:	Harnesburg (Tzaneen) Diamond Exploration: Conduct desktop studies and data gathering in the office. Acquire knowledge in exploration activities including indicator mineral sampling, gravity geophysical technique and drilling methods. Drill site supervision. Conduct stream sediments, soil sampling and core-logging.
Duration	:	11 Oct 2007 to 31 Jan 2008 (4 months, during university holidays)

TRAINING COURSES

- 17- 19 April 2012: GSSA Drilling Methods & Techniques in Resource Exploration
- 13-14 September 2012: GSSA Exploration Drill Site Safety
- 3 May 2013: SHE Representative Training
- 6-10 May 2013: Witwatersrand University, A3 SHE Risk Assessment Management
- 22 July 2013: AATCGS Geophysics 101: Basics of Geophysics and Its Application in Coal
- 31 July 2013: Mentorship Training
- 14 April 2014: A2 Safety for Managers
- 13 May - 26 June: Lump Ore Beneficiation (Basic Coal Preparation): Metallurgy G101-105, Colliery Training College, Witbank
- 14-17 July 2014: Safety Leadership Programme
- 6-8 Oct 2014: Understanding Coal Quality, ALS Witbank Training
- 3-7 Nov 2014: Foundation for Leadership Programme
- 3 Feb 2015: 4X4 Defensive Driving Training
- 1 May 2015: Assertiveness Awareness and Training
- 21-22 July 2016: Time Management Training

SYMPOSIUMS

- 29 July 2013: **Presenter:** 4th Prof Humphrey Memorial Post-Graduate Symposium, University of South Africa
- 11 November 2015: **Presenter:** Wits GSSA REI Colloquium: Economic Potential and Viability of reclaiming mine dumps in the Limpopo Provice.

CONFERENCES

LIST OF CONFERENCE PROCEEDINGS AND SYMPOSIUMS:

- 26-28 November 2012: Aminergy Acid Mine Drainage South Africa Conference
- 10-12 March 2014: **Presenter**: SAICE *5th* International Mining and Industrial Waste Management Conference
- 29 Sept-3 Oct 2014: 9th International Mine Closure Conference, Sandton
- 16-17 March 2015: Workshop: South Africa Mining-Related Landscape* Rehabilitation Status Quo: Identifying Work Required to Close Current Knowledge gaps, WRC, Pretoria.
- 8-11 Sept 2015: Land Rehabilitation Society of Southern Africa (**LaRSSA**): Mine rehab and biodiversity.
- N.K. Singo*, 2015. Wits GSSA REI Colloquium: Economic Potential and Viability of reclaiming mine dumps in the Limpopo Province. 11th November 2015, Witwatersrand University, Johannesburg, South Africa.
- N.K. Singo* and J.D. Kramers, 2016. Uranium as a potential health hazard as well as (even) an economic asset in the Louis Moore tailings dump, near Giyani, Limpopo Province. In symposium Proceedings; 6th Mintek Analytical Symposium "The Environment", Mintek G4, Randburg, Johannesburg, South Africa, Friday 21st October 2016.

- N.K. Singo* and J.D. Kramers, 2017. Chrysotile (white asbestos) occurrence in the Nyala Magnesite Mine dumps and the soils around them, and its health implications to the community of Zwigodini Village, Limpopo Province. 5th Annual Conference. 1-4 August 2017, Resilient Landscapes in a Changing Climate.
- N.K. Singo* and J.D. Kramers, 2017. Unlocking the potential economic benefit of a tailings dump through resource modelling and estimation: SHE (safety, health, and environmental) issues and solutions. MineSafe 2017 Conference, Striving for zero harm (driving excellence through compliance), Emperors Palace, Hotel Casino Convention Resort, Johannesburg, 30–31 August 2017, The Southern African Institute of Mining and Metallurgy (SAIMM).

List of publications:

- N.K. Singo, and J.D., Kramers, 2017. Geochemical and Mineralogical Characterization of two low grade stockpiles (mine residue deposits): acid mine drainage vs neutral-alkaline mine drainage perspectives. A case study of the Musina (Copper) and Nyala (Magnesium) mines, South Africa.
- N.K. Singo, and J.D., Kramers, 2017. Preferred tailings retreatment approach to unlock value and create environmental sustainability of the Louis Moore tailings dump, near Giyani, South Africa.
- N.K. Singo, and J.D., Kramers, 2017. Copper tailings retreatment to deliver economic value with concurrent rehabilitation at the Musina mine, South Africa.

List of workshops:

N.K. Singo**, and J.D. Kramers, 2016. Uranium as a potential health hazard as well as (even) an economic asset in the Louis Moore tailings dump, near Giyani, Limpopo Province. Remediation of Heavy Metal Contaminated Soil and Groundwater Workshop, 10-11 November, 2016 at the Focus Rooms Sunninghill, Sandton, Johannesburg, South Africa.

Prof Jan D. Kramers

Professor of Geochemistry, UJ

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Khuthala Petane

Former Geologist, Mozambique

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Manager, Geocoal Consulting Services

Coal

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+27 (0) 46 6244 791 (Tel Work)

bwbotha@gmail.com

Brandan Botha

Former Geology Manager, Anglo American Thermal

Principal Geologist, Coffey Exploration Limited

+27 (0) 83 291 2951 (SA Mob) dawie@geocoal.co.za,

CERTIFICATE OF QUALIFIED PERSON

Ndinannyi Kenneth Singo, PhD, Pr.Sci.Nat.

10 Khayalami Estate, Tasbet Park Ext 11, Witbank, ZA

I, Ndinannyi Kenneth Singo, am a Professional Earth Scientist (Incl. Geologist, Environmentalist and Mining Specialist), Director and Principal Consultant at Singo Consulting (South Africa) Limited.

This certificate applies to the following technical work:

- Environmental Impact Assessment
- Environmental Management Plans
- Social and Community Development Plans
- Geological (Exploration, Resource Estimation and Competency Report)
- Hydrological and Hydrology (Surface and Groundwater Studies)
- Soil Science (Soil profiling, Modelling and Soil Chemistry)
- Geotechnical (Soil and Rock)
- Mining Feasibility Studies

I am a member of the South African Council of Natural Science Professions (SACNASP), Geological Society of South Africa (GSSA), the Land Rehabilitation Society of Southern Africa (LaRSSA) and South African Affiliates of the International Association for Impact Assessment. I graduated with a Mining and Environmental Geology Honours degree from the University of Venda in 2009, Master of Science from University of South Africa in 2013 and doing final year of a doctorate degree from the University of Johannesburg.

I have practiced my profession continuously since 2008 and have been involved in general fields of earth science practice:

(a) Mapping: field mapping, regional and detailed; borehole logging; structural interpretation; data compilation and presentation; appropriate survey methods; photogeology; orthophoto mapping remote sensing; practical cartography.

(b) Sampling techniques: practical sampling methods; geostatistics; data discrimination and evaluation; data interpretation and presentation.

(c) Analytical techniques: laboratory methods applicable to–economic, mining and exploration geology; engineering geology; environmental geology; geomorphology; geochemistry and mineralogy; geohydrology; geophysics; earth science research.

(d) Communication: report writing; verbal presentation; confidentiality; professional ethics.

As a result of my experience and qualifications, I am a Qualified Person as defined in SACNASP

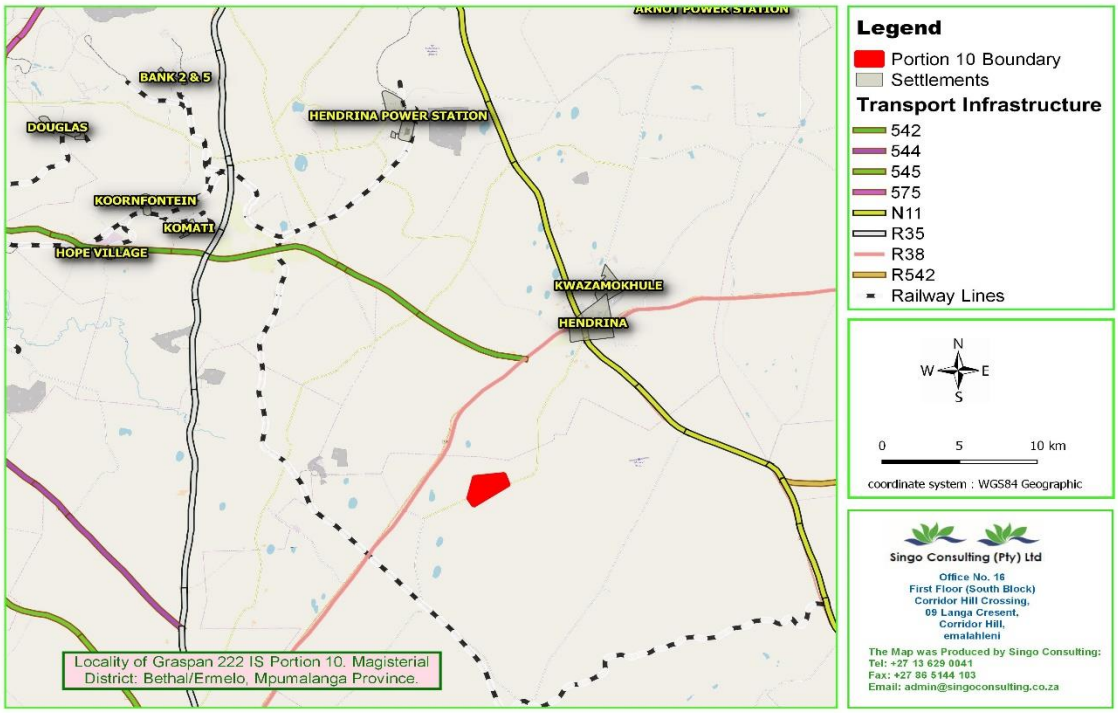
As of the date of this certificate, to the best of my knowledge, information and belief, the technical report contains all scientific and technical information that is required to be disclosed to make the technical report not misleading.

NK Singo, PhD (Cand), Pr. Sci. Nat.

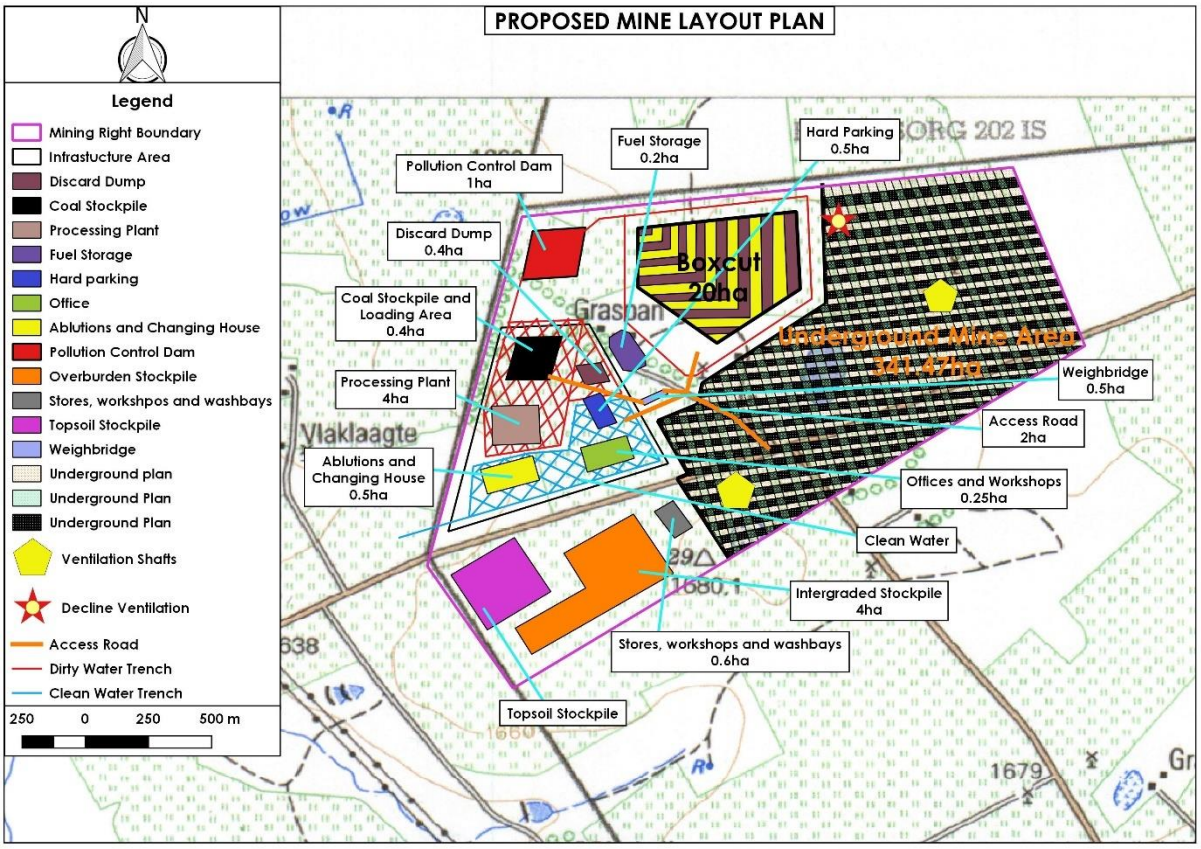
Dated: 21 June 2018

ORIGINAL SIGNED AND SEALED

Appendix 3: Locality map



Appendix 4: Mine layout map - Final site map



PUBLIC PARTICIPATION REPORT

- Newspaper advert
- Site notice
- Background information document (BID)
- Communication/meetings with stakeholders (minutes)
- Meeting with councillor and ward committee (to be included in the EIA phase)
- Register of I&APs

Appendix 5: Newspaper advert

NOTICES

STEVE TSHWETE HOUSING ASSOCIATION
PROJECT NO. 2018-010
CONSTRUCTION OF 63 NEW APARTMENT UNITS, HOPE CITY PHASE 2

NOTICE AND INVITATION TO TENDER FOR MAIN CONTRACTOR ON THE STEVE TSHWETE HOUSING ASSOCIATION

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORIZATION

Singo Consulting (Pty) Ltd

IBM & T

19 October 2018 HIGHVELDER - Schools 11

Pieter de Beer (LS JJ van der Merwe), John-Henri van Zyl, Dean van Breda en Reinhardt Vorster tydens die Suid-Afrikaanse Skietkampioenskap in Newcastle. (Foto: Verskaf)

Skuts staan hul man

[illegible]

Ermelo speel vir Pumas se 7's-rugbyspan

[illegible]

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORIZATION, INVITATION TO PUBLIC MEETING AND AVAILABILITY OF THE SCOPING REPORT ON PORTION 10 OF THE FARM GRASPAN 222 IS LOCATED IN THE MAGISTERIAL DISTRICT OF ERMELO, MPUMALANGA: DMR REF NUMBER: MP30/5/1/2/2/[illegible]

This notice serves to inform all interested and affected parties that in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002), National Environmental Management Act (Act No 107 of 1998) as amended in [illegible] and the National Water Act of 1998, that [illegible] Mining & Traders (Pty) Ltd intends to carry out environmental authorization process (Scoping & Environmental Impact Assessment Reporting (S&EIR)) and an Integrated Water Use License Application (IWULA) for coal mining right.

Description: [illegible] Mining & Traders (Pty) Ltd holds a prospecting right [illegible] and intends to establish a coal mine through both open pit and underground mining methods with associated infrastructures.

Project Location: The proposed mining right area is located approximately [illegible] of [illegible], adjacent to [illegible] of public roads in the magisterial district of Ermelo, Mpumalanga.

Size of the site: The application is on portion 10 of the farm Graspan 222 IS covering approximately [illegible] hectares (ha) in extent.

Notice of Scoping report: This serves to notify I&AP's of the mining right, environmental authorization application and availability of the Scoping Report for public review for a minimum of 30 days from the **18th of October 2018 to the 18th of November 2018.** Report will be available at [illegible] Public Library [illegible], can also be sent via email upon request and via drop box link from the EAP.

Notice and Invitation to a Public Meeting: A public meeting will be held on **Tuesday the [illegible] of October 2018 from [illegible] at [illegible] Local Clinic [illegible] Street).**

All interested and affected parties are welcome to attend the meeting. A Water Use License Application (WULA) under the provisions of the National Water Act No. 36 of 1998 (NWA) is required for the mining operations. WULA will be applied for and submitted to the Department of Water and Sanitation [illegible] Water Management Catchment Agency. Water use is defined in terms of Section 21 of the NWA. There are [illegible], wetlands and [illegible] River around the Mining Right area, which must be authorized. It is anticipated that [illegible] Mining & Traders (Pty) Ltd will require water for mining operations and portable use. There is associated [illegible] and wetlands near the proposed mining right area. The development of the mine would therefore be 500m away from the wetlands. An integrated WULA application will be followed for the following water uses:

- 21(a) Abstraction from a borehole
- 21(c) and (i) Activities within 500m of a wetland
- 21(g) Dust suppression
- 21(g) Coal stockpiling
- 21(g) Mine Residue Disposal
- 21(g) Dirty water dam(s)

Other required Section 21 water uses will be detailed in the Scoping Report for public review.

The following are competent authorities with respect to this application:

Authority	Legislation	Comments
Department of Mineral Resources (DMR).	EIA Regulations 2017 under Section 24 of NEMA (GNR 982) Regulations 21-24, 40-44; EIA Regulations. Listing Notice 1 of 2014 (GNR 327 dated 7 April 2017) 10, 12, 56 Listing Notice 2 (GNR 325) 6 and 15	The development of the facilities or infrastructure or activities which require a mining right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002) The clearance of an area of 20 hectares or more of indigenous vegetation.
Department of Environmental Affairs (DEA).	Waste Act (NEM: WA) (Act 59 of 2008) Category B (Activity 4 (10) and 4 (11) Section 19 of NEM: WA 59/2008 as inserted by 2017 amendment.	Construction of mine residue facilities, [illegible] spoils dumps, overburden dumps and slurry paddocks and day area
Department of Water and Sanitation.	Section 21 water use – National Water Act, 1998 (Act No. 36 of 1998).	An application for a water uses license will be lodged with the Department of Water and Sanitation: • 21(a) Abstraction from a borehole • 21(c) and (i) Activities within 500m of a wetland • 21(g) Dust suppression • 21(g) Coal stockpiling • 21(g) Mine Residue Disposal • 21(g) Dirty water dam(s) • 21(j) Removing, discharging or disposing of water found underground, if it is necessary

Consultant contact person:

Singo Consulting (Pty) Ltd

Office No. 14, First Floor (South Block) Corridor Hill Crossing, 09 Langa Crescent, Corridor Hill, eMalahleni,

SENIOR EAP: Kenneth Singo
Cell: [illegible]
Fax: +27 86 5144 103
Email: [illegible]@singoconsulting.co.za

JUNIOR EAP: [illegible]
Cell: [illegible]
Fax: +27 86 5144 103
Email: [illegible]@singoconsulting.co.za

Consultant contact person:

IBM & T

P O Box 7787, [illegible] Park, Emalahleni, 1040

071 125 8994 - Allen
072 813 9736 - Maxima

Fax: [illegible]
Email: [illegible]@gmail.com
Email: [illegible]

12 July 2019 HIGHVELDER - Schools 13

Ligbron se wintersportspanne gereed vir Virsekerbeker en Noordvaal Reeks

Ligbron Akademie vir Tegnologie het die derde kwartaal met vriendskaplike wintersportwedstryde teen Hoërskool Voortrekker van Bethlehem op 5 Julie afgeskop.

Dié wedstryde het vir beide skole as voorbereiding vir die Virsekerbeker- en Noordvaal Reeks as eindrondes gedien.

Uitstekende sport het die toeskouers op hul tone gehou en Ligbron se spanne het [illegible] behaal.

Die rugbyspanne het hulle goed van hul taak gekwyt, met slegs twee spanne wat hulle wedstryde verloor het.

Die 0/14 A-span het met 19-5 gewen, terwyl die 0/14B-span hul teenstanders met 'n skitterende telling van 57-0 oorrompel het. Die 0/15A-span het hul wedstryd 22-7 gewen, die 0/16A-span het 'n 19-14 oorwinning behaal en die 0/16B-span moes die knie buig met 'n telling van 24- 8.

Die derde span het 'n gelykop van 0-57 [illegible] en die tweede span het 17-27 verloor.

Die eerste span het die toeskouers op die punte van stoele gehou in die spannende stryd.

Ligbron het as die wenners van die veld afgestap met 'n telling van 38-34.

Ligbron se hokkiespanne het al drie hulle wedstryde verloor.

Die 0/16-span het hul wedstryd 0-3 verloor, terwyl die tweede span en eerste span met onderskeidelik 0-4 en 0-5 verloor het. Die netbalspanne het hard gewerk op die baan, maar slegs een span kon daarin slaag om hul wedstryd te wen.

Ligbron se 0/15-span het met 'n nederlaag van 3-20 van die baan afgestap, terwyl die 0/16-span hul wedstryd in die laaste minute van die wedstryd met 17-15 gewen het.

Die tweede span het hulle wedstryd met 'n telling van 7-21 verloor, terwyl die eerste span 12-24 verloor het.

Martin Meyer van Ligbron Akademie vir Tegnologie duik sy teenstander plat.

Meghan Herbst van Ligbron Akademie vir Tegnologie vat die bal van haar teenstander af tydens die vriendskaplike wedstryde teen Hoërskool Voortrekker.

Cara Brower van Ligbron Akademie vir Tegnologie maak gereed om 'n doel vir Ligbron te probeer aanteken, tydens die vriendskaplike wedstryde teen Hoërskool Voortrekker.

Sê jou sê en deel jou nuus met ons

NOTICE OF COAL MINING RIGHT APPLICATION, ENVIRONMENTAL AUTHORISATION AND AVAILABILITY OF THE FULL DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT OF PORTION 10 OF THE FARM GRASPAN 222 IS IN THE MAGISTERIAL DISTRICT OF ERMELO, MPUMALANGA PROVINCE. DMR REF NUMBER: MP [illegible]

This notice serves to inform all interested and affected parties that in terms of the Mineral and Petroleum Resources Development Act [illegible], National Environmental Management Act [illegible] as amended [illegible] and the National Water Act [illegible], that Incrediblé Excellent Mining & Traders (Pty) Ltd intends to carry out an environmental authorisation process (Full Environmental Impact Assessment Reporting (EIR)) and an Integrated Water Use License Application (IWULA) for Coal mining right.

Description: [illegible]

Project Location: [illegible]

Size of the site: [illegible]

Notice of Full Draft Environmental Impact Assessment Report (EIAR): [illegible]

Notice and Invitation to a Public Meeting: [illegible]

A Water Use License Application (IWULA) under the provisions of the National Water Act [illegible] [illegible]

Consultant contact person (EAP):

Singo Consulting (Pty) Ltd

[illegible]

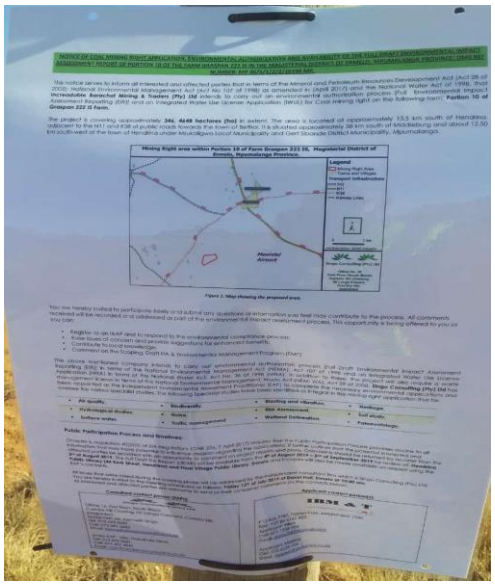
Applicant contact person:

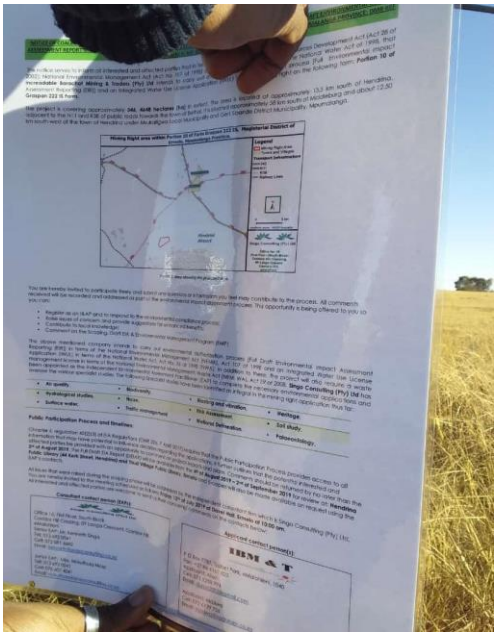
IBM & T

[illegible]

Appendix 6: Site notice

Site notices that were plugged around the farm boundaries ad mostly used roads.






OLIFANTS

Appendix 7: Background information document (BID)

BACKGROUND INFORMATION DOCUMENT

FOR COAL MINING RIGHT APPLICATION, INTEGRATED WATER USE LICENSE APPLICATION, FULL ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL AUTHORISATION, ON PORTION 10 OF THE FARM GRASPAN 222 IS LOCATED IN THE MAGISTERIAL DISTRICT OF ERMELO, MPUMALANGA.

Prepared by:

Singo Consulting (Pty) Ltd

Office No. 16,First Floor (South Block)

Corridor Hill Crossing, 09 Langa Crescent,

Corridor Hill, eMalahleni,

1035

Prepared for:

IBM & T

P O BOX 7787 Tasbet Park

eMalahleni

1040

ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

ENVIRONMENTAL ASSESSMENT PRACTITIONER	SINGO CONSULTING (PTY) LTD
Contact Person (s)	Senior: Kenneth Singo Junior: Rudzani Shonisani Junior 2: Siyabonga Mashigo Junior 3: Nokuthula Nkosi
Address	Office No: 16 First Floor (South Block) Corridor Hill Crossing 09 Langa Crescent, Corridor Hill, eMalahleni, 1035.
Postal Address	Private Bag X 7297, Postnet Suite 87, Highveld mall Witbank 1035
Contact Number(s):	Senior: 078 2727 839 / 072 0816 682 Junior: 078 5481 244 / 079 9304 772 Junior 2: 065 875 8194/ 079 177 8410 Junior 3: 076 607 4041/081 386 8589
Facsimile:	+27 86 5144 103
Telephone:	013 692 0041
Email(s):	Senior: kenneth@singoconsulting.co.za Junior: rudzani@singoconsulting.co.za Junior 2: siyabonga@singoconsulting.co.za Junior 3: nokuthula@singoconsulting.co.za

PROJECT APPLICANT:

NAME OF APPLICANT	Increadable Berachot Mining and Trading (Pty) Ltd
CELL NO:	071 125 8994 - Allen 072 612 9726 – Masiwa
FAX NO:	0866161823
EMAIL:	duroy2002@gmail.com masiwa@vodamail.co.za
POSTAL ADDRESS:	P.O. Box 7787, Tasbet Park, eMalahleni, 1040.
PHYSICAL ADDRESS:	Portion 237 R555, Old Middelburg Road, Kromdraai eMalahleni, Mpumalanga, 1038
FILE REFERENCE NUMBER DMR:	MP30/5/1/2/2(10190) MR

1. PROJECT BACKGROUND

1.1 INTRODUCTION

Increadable Berachot Mining & Traders (Pty) Ltd has applied for a mining right in terms of the Minerals and Petroleum Resources Act (Act No.28 of 2002) (MPRDA) (as amended) over Portion 10 of the Farm Graspan 222 IS. DMR Ref: MP30/5/1/2/2/10190MR.

The Graspan Coal mining right area comprises approximately 346, 4648 hectares and is located approximately at 13.5 km South of Hendrina, adjacent to the N11 and R38 public roads towards Bethal town. It is also situated approximately 58 Km south of Middelburg and about 12.50 km South-West of the town of Hendrina town under Msukaligwa Local Municipality and Gert Sibande District Municipality in the Mpumalanga Province of South Africa. (Refer to figure 1 for Regulation 2.2 and figure 2 for locality map).

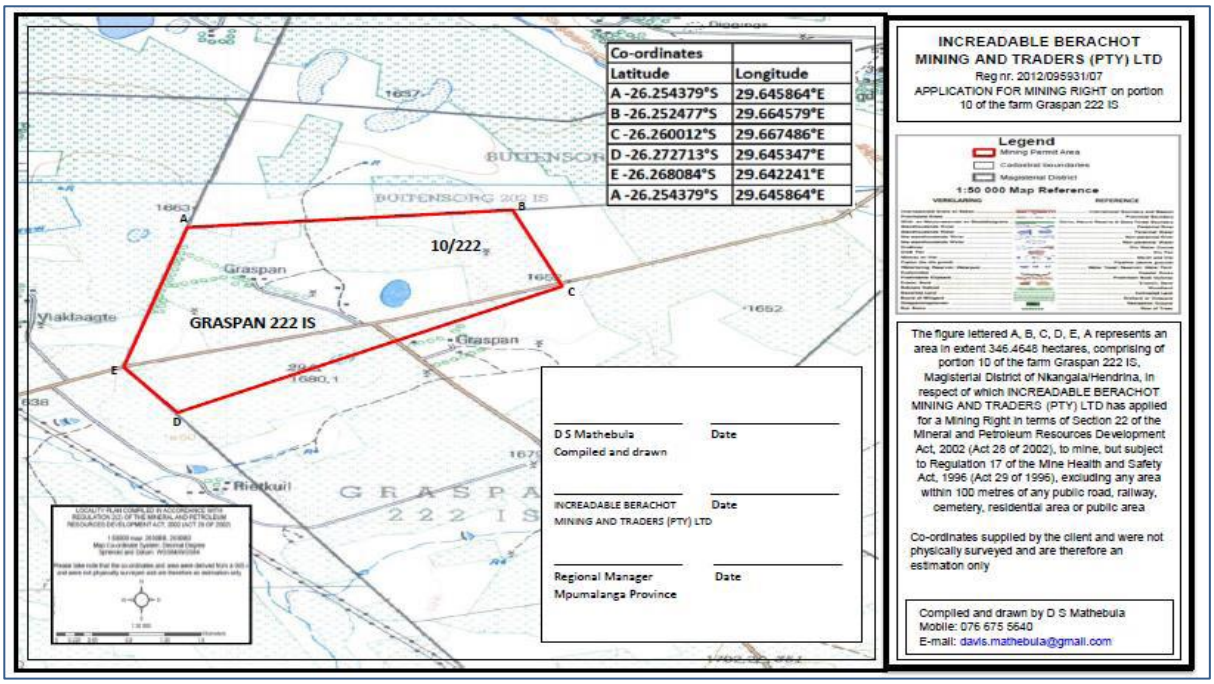


Figure 57: Regulation 2.2 of the proposed farms.

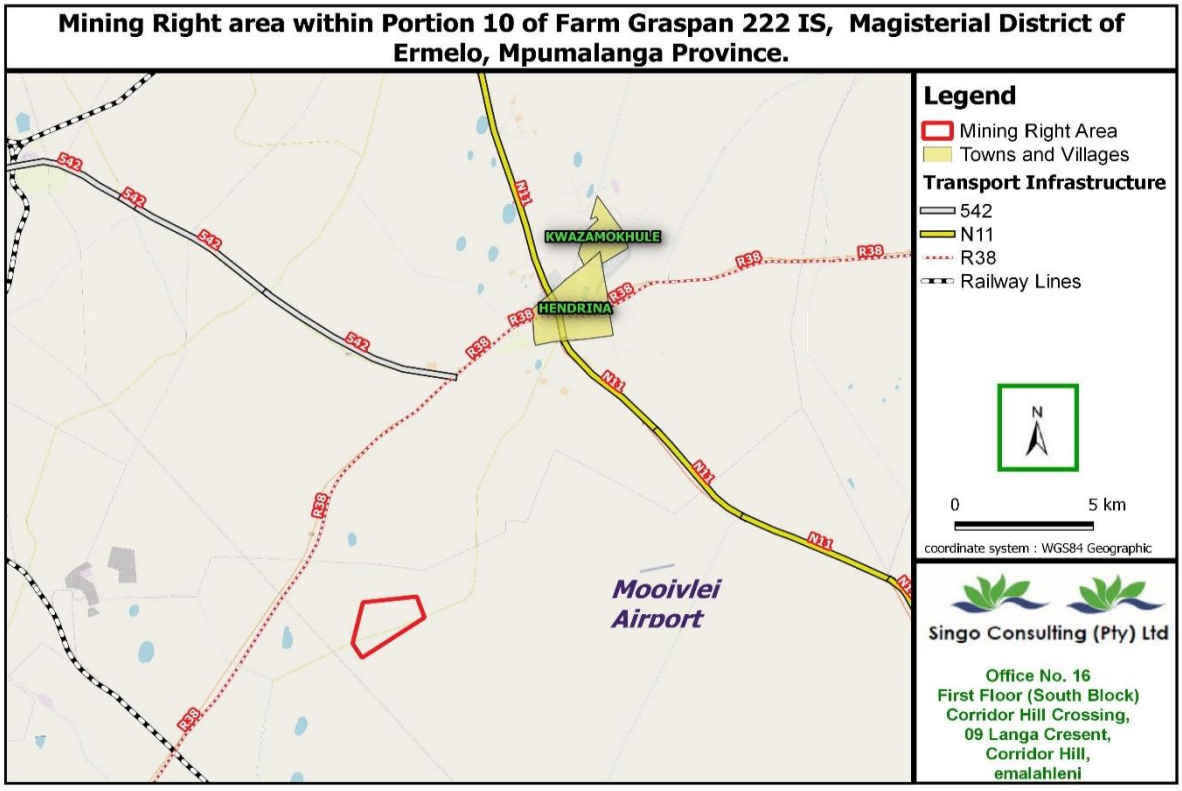


Figure 58: Locality map of the project area.

This application for a mining right is subject to an application for an Environmental Authorization in terms of the National Environmental Management Act (NEMA), Act 107 of 1998. In addition to this, the project

will also require a waste management license in terms of the National Environmental Management: Waste Act (NEM: WA), Act 59 of 2008, (amended in 2017) and a water use license in terms of the National Water Act, Act No. 36 of 1998 (NWA).

Singo Consulting (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) to complete the necessary environmental applications and oversee the various specialist studies.

The various Specialist studies are:

- Agricultural Impact Assessment study.
- Air Quality Study
- Biodiversity study
- Blasting and vibration Assessment
- Emergency Preparedness Plans
- Heritage study
- Hydrological Study
- Integrated Water and Waste Management
- Mining Right Layout
- Paleontology
- PCD and General Engineering Design
- Rehabilitation Plan
- Risk Assessment Report
- Soil study
- Surface and Storm Water Management Report
- Traffic Management Study
- Water Balance Report
- Wetland Delineation Study

2. PURPOSE OF THIS DOCUMENT

This document (the Background Information Document or "BID") has been compiled to provide you, the Interested and Affected Party (I&AP), with information on the proposed project and the associated environmental authorization process. The main purpose of the BID is to;

- Provide a description of the proposed Project;
- Provide an overview of the environmental regulatory processes which will be undertaken in accordance with the South African legislation; and

- Provide details of the Public Participation Process (PPP) and how Interested and Affected Parties (I&APs) can become involved.
- Register as an I&AP and to respond to the environmental compliance process;
- Raise issues of concern and provide suggestions for enhanced benefits;
- Contribute to local knowledge;
- Comment on the full EIA & Environmental Management Program (EMP)

3. THE ROLE OF I&AP's

Communities, neighbours, government representatives, stakeholders such as community leaders, Non-governmental organizations (NGO) are being invited to participate in the EIA process by means of published advertisements, site notices and written correspondence. I&APs are invited to assist in:

- Identifying issues of concern to be investigated, as well as possible impacts of the project on the natural & social environment;
- Suggesting alternative means in which to mitigate possible negative impacts and enhance positive impacts.

You are hereby invited to participate freely and submit any questions or information you feel may contribute to the process. All comments received will be recorded and addressed as part of the environmental impact assessment process. Please complete the attached comment form (APPENDIX A) and return to us on:

ENVIRONMENTAL ASSESSMENT PRACTITIONER	**SINGO CONSULTING (PTY) LTD**
Contact Person (s)	Senior: Kenneth Singo Junior: Rudzani Shonisani Junior 2: Siyabonga Mashigo Junior 3: Nokuthula Nkosi
Address	Office No: 16 First Floor (South Block) Corridor Hill Crossing 09 Langa Crescent, Corridor Hill, eMalahleni, 1035.
Postal Address	Private Bag X 7297, Postnet Suit 87, Highveld Mall Witbank 1035
Contact Number(s):	Senior: 078 2727 839 / 072 0816 682

	Junior: 078 5481 244 / 079 9304 772 Junior 2: 065 875 8194/ 079 177 8410 Junior 3: 076 607 4041/081 386 8589
Telephone	013 692 0041
Facsimile:	+27 86 5144 103
Email(s):	Senior: kenneth@singoconsulting.co.za Junior: rudzani@singoconsulting.co.za Junior 2: siyabonga@singoconsulting.co.za Junior 3: nokuthula@singoconsulting.co.za

4. PROJECT OVERVIEW

Mineral Applied For: Coal resources

Mining Methods: Open Cast Mining and Underground Mining

Life of Mine: 30 years lifespan

Potential Market: International markets, Eskom, other domestic (i.e. coal stove & power generation) and (i.e. for steel production, liquid fuel and for cement manufacturing).

The main components of the database included spreadsheets describing each of the following data formats, collar, lithological, raw quality and the wash product quality database.

From the Prospecting phase, a total of 14 boreholes collared on portion 10 of the Graspan Farm (number 222 IS) were used for the structural model, four (4) of which were drilled in late 2014. In addition to this, ten (10) boreholes drilled making use of diamond core drilling in 2017 were used to improve both the structural and resource model. In preparation for the geological model, a geological database was generated and subsequently validated.

The seam compositing over the selected horizon was conducted in an early stage of the Graspan Coal Project in order to get the practical mining horizons which would have economic potential. The selection process took into consideration the minimum cumulative thickness (0.5 m), the maximum cumulative ash content (50% for the multiple seams). The sample thickness was used as a weight for calculation of the cumulative quality results and was concluded that Graspan is a mid-sized, advanced stage, coal exploration property that is endowed with 6.781 mineable tonnes in-situ [MTIS] (categorized under the Indicated and Measured Coal Resource) and 5.737 MTIS (categorized under the Inferred Coal Resources). This project is located in the Ermelo coalfield and is made up of one potentially economic seam, the C-Seam. The current estimated Coal Resources are amenable to a combination of both open cast and underground extraction methods, but exhibit characteristics that predominantly point to an underground operation. The project is at a very advanced exploration stage although Coal Reserves are yet to be declared.

The underground will be accessed via a boxcut audit. It is proposed that the boxcut, plant and associated mine infrastructure be located on Portion 10 of the farm Graspan 222 IS.

Infrastructures that will be used:

- Access & Haul roads (with necessary security) including the upgrading of the access point to the gravel road;
- Contractor's Yard with septic/chemical ablution facilities;
- Offices;
- Weighbridge, workshop and stores (with septic/chemical ablution facilities);
- Rail Siding;
- Diesel facilities and a hardstand;
- Power and Water;
- Boxcut;
- Stockpiles (topsoil, overburden, subsoil/softs, ROM);
- Surface water management measures (storm water diversion berms and trenches, pollution control dams, tailings dam etc.);
- Crushing, screening & wash facility; and

 Disposal dump.

Coal will be transferred from the underground to surface by means of a conveyor belt. Whereby, it will be sent to the plant area for processing (crushing, screening and washing).

Mine residue from the plant will be disposed of onto an integrated disposal dump.

Product coal will be sized and stockpiled in designated areas for pre-qualification prior to being transported to the market.

It is currently anticipated that the plant will run 24/7

Service Requirements:

- Electricity for the operation will be sourced from Eskom (8MVA required).
- It is envisaged that potable/ domestic water will be sourced from boreholes on site, other alternatives are also being considered.
- General waste can be collected for disposal at the Municipal dump.

Industrial waste will be collected for disposal at a suitably licensed facility.

- Sewage will be collected within conservancy tanks to be emptied by honey sucker for treatment at a suitably licensed facility. Alternatively, a small, package sewage plant will be installed on site.

Employment:

- The project can possibly create vast employment opportunities.

5. ENVIRONMENTAL AUTHORISATION PROCESS

Following the submission of an application for an environmental authorization the applicant is required to subject the application to either a Basic Assessment or a Scoping and Environmental Impact Assessment (EIA) process.

During this process the positive and negative impacts associated with the development are assessed; and suitable alternatives and/or management measures are proposed to reduce the environmental impacts.

As the application relates to mining activities (Listing Notice 2), a full Scoping report was completed and EIA process will be followed. The steps in this process are briefly outlined below:

- Pre-application Phase

I. Finalize project description
II. Identify I&APs
III. Circulate BIDs, place site notices and advertisements
IV. Submit application forms to the Department of Mineral Resources (DMR)

- Scoping

I. Consider baseline environment (commence with specialist studies)
II. Identify potential impacts for further consideration
III. Initial public meeting to identify I&AP issues and concerns
IV. Assess alternatives
V. Identify plan of study for the EIA
VI. The Scoping Report was compiled and put out for public review for a period of 30 days then the final Scoping Report was finalized and submitted to DMR

- EIA / EMP Phase

I. Specialist studies are finalized
II. Impacts are rated and mitigation measures proposed where possible
III. Monitoring programmes proposed to ensure mitigation measures are efficient;
IV. EIA/EMP Report is compiled and put out for public review for a period of 30 days
V. 2nd Public meeting is held to present the EIA/EMP Report and note any additional comments and concerns
VI. EIA/EMP Report is finalized and submitted to DMR

- Decision

I. DMR makes a decision on the application and issues a record of decision
II. All I&APs are notified of the outcome of application, and their right to appeal.

The EIA/EMP reports will be compiled in the format prescribed by the DMR, in accordance with NEMA and NEMA: WA (integrated application).

The overall timeframe for the environmental authorization process is approximately 300 days as regulated by NEMA.

6. LISTED ACTIVITIES

The following table summarizes the preliminary list of activities identified in terms of NEMA and NEMA: WA. These activities will be included in the application for environmental authorization:

GOVERNMENT NOTICE:	ACTIVITY NO.:
GNR 983, Listing Notice: 1	11, 12, 13, 22, 24, 27 & 30
GNR 984, Listing Notice: 2	6, 15, 17 & 21
GNR 985, Listing Notice: 3	2, 4, 10, 12 & 14
GNR 921 of NEM: Waste Act Category	Waste Act (NEM: WA) (Act 50 of 2008): Category B (Activity 4(10) and 4 (11) A: Activity 14 Category B: Activity 7, 10 & 11

7. WATER USES

A Water Use License Application (WULA) under the provisions of the National Water Act No. 36 of 1998 (NWA) is required for the mining operations. WULA will be applied for and submitted to the Department of Water and Sanitation: (Mpumalanga& Gauteng Region) - Olifants Water Management Catchment Agency. Water use is defined in terms of Section 21 of the NWA. There are pans, wetlands and Olifants River around the permit area, which must be authorized. It is anticipated that Increadable Barachot Mining & Traders (Pty) Ltd will require water for mining and potable use. There are associated tributaries and wetlands near the proposed mining right area. The development of the mine would therefore be 500m away from the wetland.

The lead authority for the authorization of water uses in terms of the NWA is the Department of Water Affairs and Sanitation (DWS). In terms of Section 21 of the NWA, all water uses that are not deemed to be Schedule 1 uses must be licensed with DWS. The following water uses are anticipated to occur on site:

21(a) Abstraction from a borehole

21(c) and (i) Activities within 500m of a wetland

21(g) Dust suppression

21(g) Coal stockpiling

21(g) Mine Residue Disposal

21(g) Dirty water dam(s)

Section 21 (i) - altering the bed, banks, course or characteristics of a watercourse(wetlands on mining area, operation to take place within 500m).

Other required Section 21 water uses will be detailed in the Scoping Report for public review. The following are competent authorities with respect to this application:

Table 43: Competent Authorities.

Authority	Legislation	Comments
Department of Mineral Resources (DMR).	EIA Regulations 2017 under Section 24 of NEMA (GNR. 982) Regulations 21- 24, 40-44; EIA Regulations. Listing Notice 1 of 2014 (GNR 327 dated 7 April 2017): 10, 12, 56 Listing Notice 2 (GNR 325) 6 and 15	The development of the facilities or infrastructure or activities which requires a mining right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002).The clearance of an area of 20 hectors or more of indigenous vegetation.
Department of Environmental Affairs (DEA).	Waste Act (NEM: WA) (Act 50 of 2008): Category B (Activity 4(10) and 4 (11) Section 19 of NEM: WA 59/2008 as inserted by 2017 amendment.	Construction of mine residue facilities, boxcut spoils dumps, overburden dumps and slurry paddocks and day area

Department of Water and Sanitation.	Section 21 water use – National Water Act, 1998 (Act No. 36 of 1998).	An application for a water uses license will be lodged with the Department of Water and Sanitation: ▪ 21(a) Abstraction from a borehole ▪ 21(c) and (i) Activities within 500m of a wetland ▪ 21(g) Dust suppression ▪ 21(g) Coal stockpiling ▪ 21(g) Mine Residue Disposal ▪ 21(g) Dirty water dam(s) ▪ 21(j) Removing, discharging or disposing of water found underground, if it is necessary

8. POTENTIAL ENVIRONMENTAL IMPACTS

The following potential impacts have been identified and will be assessed further during the environmental authorization process:

- Potential to alter the topography
- Loss of soil characteristics - erosion and compaction
- Change in land use from farming to mining
- Loss of biodiversity – vegetation clearance and habitat destruction
- Potential for alien invasive establishment
- Reduced flow to downstream water catchment
- Potential pollution to water resources (surface and groundwater)
- Drawdown cone from dewatering activities (groundwater quantity)
- Increased dust and emissions
- Increased noise levels
- Visual aesthetics and sense of place will be altered
- Damage to property/infrastructure from blast events
- Potential damage to heritage sites (grave and/or archaeological artefacts)
- Influx of job seekers to the area
- Increased traffic – coal haulage

The following specialist studies are currently proposed:

- Agricultural Impact Assessment study.
- Air Quality Study
- Biodiversity study
- Blasting and vibration Assessment
- Emergency Preparedness Plans
- Heritage study
- Hydrological Study
- Integrated Water and Waste Management
- Mining Right Layout
- Paleontology
- PCD and General Engineering Design
- Rehabilitation Plan
- Risk Assessment Report
- Soil study
- Surface and Storm Water Management Report
- Traffic Management Study
- Water Balance Report
- Wetland Delineation Study

9. LEGISLATION OF PUBLIC PARTICIPATION PROCESS

The PPP must comply with the several important sets of legislation that require public participation as part of an application for authorization or approval; namely:

- The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002 - MPRDA);
- The National Environmental Management Act (Act No. 107 of 1998 - NEMA);
- The National Environmental Management Waste Act (NEM: WA, Act No. 59 of 2008- amended 2017); and
- The National Water Act (NWA, Act No. 36. Of 1998).

Adherence to the requirements of the above-mentioned Acts will allow for an Integrated PPP to be conducted, and in so doing, satisfy the requirement for public participation referenced in the Acts. The details of the Integrated PPP are provided below.

10. PUBLIC PARTICIPATION PROCESS

Public involvement is an essential component of the environmental process. It addresses the right of I&APs to be informed of the proposed activities and to be involved in decisions that affect them. It also affords the

environmental assessment practitioner the opportunity to assess and address the issues and concerns raised by I&APs thus allowing us to assess all the potential impacts of the proposed project.

For this specific proposed project, I&APs will be given a period of 30 days to comment and raise issues/concerns with regards to this BID.

Kindly keep the following dates:

- Announcement of the EIA Application: June 2019
- Stakeholder engagement and consultation: 05 July 2019 – 03 August 2019
- Review of Environmental Impact Assessment Report: 04 August 2019 – 02 September 2019
- Submission of the Final EIA & EMP: 05 September 2019

It is envisaged at this stage that public meetings will be held during the course of the application. You are hereby invited to attend the meeting at Davel Hall, Ermelo on Friday the 12th of July 2019 at 10:00 am.

- A Scoping Phase meeting was completed to introduce the project and a way forward was discussed regarding the applications.
- An EIA Phase feedback meeting will be held to report back specialist findings, the final impacts identified by specialists focusing on critical or sensitive impacts identified and the mitigation of these impacts. You will be notified by SMS/Fax/Email of the proposed time and location of the EIA/EMP Phase meeting, as per the registered I&AP's.

Please note that the full draft EIA report will be made available for public review and comment for a minimum period of thirty (30) days. All registered I&APs will be notified once available. Report will be available at Hendrina Public Library (44 Kerk Street, Hendrina, 1095) and Thusi Village Public Library in Ermelo; can also be sent via email upon request and via drop box link from the EAP.

Please complete the following comment form in clear handwriting or typing to register as an interested and affected party (I&AP) and return by no later than the 3rd of August 2019

I, _____ herewith acknowledge receipt of:

One (1) copy of the letter entitled: MINING RIGHT APPLICATION FOR THE PROPOSED MINERALS (Coal) IN ERMELO, MPUMALANGA PROVINCE.

Please comment and return to:

Singo Consulting (Pty) Ltd

Physical address:	Office No. 16, First Floor (South Block), Corridor Hill Crossing,09 Langa Crescent Corridor Hill, eMalahleni, 1035.
Postal address	P/Bag X7297, Postnet Suite 87, Highveld Mall, Witbank 1035
Tell No:	+27 13 6920 041
Fax No:	+27 86 5144 103
Email:	admin@singoconsulting.co.za kenneth@singoconsulting.co.za rudzani@singoconsulting.co.za siyabonga@singoconsulting.co.za nokuthula@singoconsulting.co.za

Personal Details:

Full Names and Surname:							
Contact Details:							
Tel(w):		**Tel(h):**		**Fax No:**		**Cell No:**	

Email:	
Physical Address:	
Postal Address:	
Preferred method of communication: fax e-mail ☐ post ☐ ☐ Preferred telephonic communication: cell home ☐ work ☐ ☐	
Organisation/Representative:	
Farm name, number and subdivision or Street Address (if applicable):	

1. What is your interest in the proposed project? E.g. Property Owner/ Lessee/ Tenant? Please provide details of the property.

2. Do you have grounds for concerns in respect to this application? **Please tick the appropriate box and substantiate**.

YES ☐ NO ☐

3. Categorized issues of concerns: **Please '' X'' the appropriate box**

	Air quality		Noise
	Archeology		Soil
	Surface water		Employment
	Groundwater		Security
	Ecology		Visual
	Land use and Planning Waste management		Quality of life Property value
	Economy		Nuisance

4. If yes, please list elaborate further.

5. Are there, in your opinion, any other interested/ or affected parties that should be contacted in relation to this application? Please ''X'' appropriate box.

YES NO

6. If yes, please provide their contact details:

Name:	Organization:	
Contact details		
Address:		
Tel No:	Fax No:	Cell No:
Email address:		

…… ……

Signature Date

Appendix 8: Communication/meetings with I&APs/ Msukaligwa Ward Counsellor.

Singo Consulting (Pty) Ltd
09 Langa Crescent, Corridor Hill
Crossing, First Floor (South Block)
Office No. 16, eMalahleni
kenneth@singoconsulting.co.za
www.singoconsulting.co.za
+27 13 692 0041
+27 86 514 4103

MEETING WITH THE COMMUNITY, APPLICANT AND CONSULTANT AT ERMELO, MPUMALANGA.

Time: 10:00 am **Date:** 12th of July 2019

Venue: Davel Community Hall, Ermelo Mpumalanga Province.

Agenda of the meeting

Meeting Roles

Programme Director: Ms Masindi Nefale

Timekeeper: Ms Masindi Nefale

Interpreter: Ms Nokuthula Nkosi

1. Opening & Welcoming
2. Apologies
3. Introduction of companies: Ms Masindi Nefale- Singo Consulting (Pty) Ltd.
4. Meeting Objectives
    - Mr Siyabonga Mashigo - Background of the proposed project.
    - Mr Kenneth Singo - Progress of the Specialist Studies.
    - Mr Anthony Singo – Update on Water Use License Application.
    - Mr Livhuwani Sigwadi – Description of Rehabilitation Studies.
    - Ms Nokuthula Nkosi – Community Forum.
    - Ms Tendani Singo – Social and Labour Plan.
5. Question/Answers Session.
6. Closing.

MEETING WITH THE COMMUNITY, CLIENTS AND CONSULTANT COMPANY.

MEETING WITH THE DAVEL STAKEHOLDERS AND THE CONSULTANT FIRM AT DAVEL CHAMBER IN ERMELO, MPUMALANGA.

Date: 12th of July 2019

Time: 09:00 am

Venue: Davel Chamber, Ermelo

Attendee: (Refer to Attendance Register)

Client (s): Increadable Berachot Mining & Traders (Pty) Ltd

Apologies: Absence of clients and to Mr. Blose

AGENDA:

Programme Director: Justice Mkhaliphi

Interpreter: Ms. Nokuthula Nkosi

Introduction: Mrs. Masindi Nefale - Singo Consulting (Pty) Ltd.

Meeting Objective

- Background of the proposed project – Mr. Siyabonga Mashigo
- Progress of the Specialist Studies – Mr. Kenneth Singo
- Update on the Water Use License Application - Mr. Anthony Singo
- Description of Rehabilitation Studies – Mr. Livhuwani Sigwadi
- Community Forum – Ms. Nokuthula Nkosi
- Social and Labour Plan - Ms. Tendani Singo

Question/Answer Session

Closing

Matter of the day:

Introduction of Singo Consulting (Pty) Ltd done Mrs. Nefale
We are Singo Consulting (Pty) Ltd from Witbank representing Increadable Berachot Mining & Traders (Pty) Ltd the company who proposes to mine on Graspan 222 IS. We offer mine related services and are gathered today as part of the public participation process where we engage with the stakeholders and community informing them about the upcoming development.

Presentation done by Mr. Singo		
Jumping into the agenda you will note that a community forum that is recognized is required by DMR for communication purposes and so forth. We have 30 days as from today until submission but remember that consultation is an ongoing process. Even if the mine is approved it will not start with operations until the community is engaging properly.		
Questions and Answers		
Issue raised/ Comments	**Response**	**Actions**
Mr. Blose: I am the leader of this community and I am concerned because I haven't received information about this project yet here you ready to engage with the community. Procedurally, you must contact me first then I inform the structured and the community.	Mr. Singo (NK):By law there are numerous ways to get a hold of the stakeholders. You are part of the stakeholders and since we are based in Witbank and do not know the structures in Davel. We then advertise in the local paper, send emails and plug notices to try and access those people who are I &AP who are supposed to be contacted. This is not our first meeting. We have been engaging with the Davel Business Community Forum and they have been assisting us to get the relevant people whom we should consult. They helped when we consulted Steve Tshwete when we thought that was the correct municipality, but we rectified that when we found that it was not. If there is a stakeholder that feels that they were excluded, consultation is an ongoing process so we may commence today. As you have raised your concern we can now rectify and ensure that from now onwards we follow the procedures you spoke of.	Noted

Mr. Mkhaliphi noted that there was dialogue within the meeting and that Mr. Blose should communicate directly with Mr. Singo (NK) about the raised concern. He plead that the presentation proceed so that knowledge about the project is gained as per public participation process. We shared this information with you prior when we found out that the project location falls under ward 10 and not Hendrina as the consultant had initially thought. Mr. Singo(NK) accepted the concern raised and mentioned that the relationship should start on a clean slate to which Mr. Blose agreed.		
Mr. Kunene(Deputy Chair TPA): For clarity purposes we are not denying Mr. Blose as the leader of the community. Singo Consulting advertised in the newspaper and we engaged with them hence they are in Davel to further explain their advertisement. May they present as part of the public participation process as we would like opportunities to come to Davel.	Mr. Mkhaliphi: Noted	Noted
Mr. Blose: Was the affected community living on Graspan 222 IS consulted?	Mr. Singo (NK): Yes, they require a separate meeting. We have consulted some landowners.	Noted
Mr. Mahamba: I am representing a resident on Graspan 222 IS. May the meeting give us direction? The community on the farm is not taken seriously as they are not present at this meeting and they are the ones who will be directly affected.	Mr. Singo (NK): Noted.	Noted.
Mr Simelane: The time factor is an issue as most people are at work thus missing the meeting because they are not aware. Mr. Blose: we spoke about this on Wednesday, but enough time is required to get the hailer	Mr. Mkhaliphi: There is a newspaper advert in the Highveld. There are notices plugged around the areas frequented by people. Lastly, we engaged Mr. Blose and he assured us that there would be a hailer.	Noted.

from the speaker's office and so forth. I also mentioned that there are several community meetings so I might not get the hailer		
Mr. Kunene: In such opportunities we need to be united as a community so that the opportunities do not miss us as we will all benefit from them. There is division on the farm which needs to be dealt with so that we all win at the end.	Mr. Singo (NK): Noted.	Noted.
WAY FORWARD		
Singo Consulting will consult the councillor who will then communicate with the structures. All will then be invited, and it was appealed that we all present people register as the structures in Davel so that there is a clear way forward. The structures present at the meeting discussed amongst themselves and the conclusion was that they would be registered as the relevant structures and the community meeting would proceed.		
End-of-Minutes		

1. Attendance Register:

Phase 1

SINGO CONSULTING (Pty) Ltd
Meeting venue: Chamber Building
Date: 12-07-2019
Time: 9:45am

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
1	Kenneth Singo	Consultant	Singo Consulting	0782727857	Kenneth@singoconsulting.co.za	
2	[illegible]	W/Ccure	[illegible]	[illegible]	[illegible]@gmail.com	
3	JUSTICE MKHALIPHI	DBA CHAIRPERSON	DAVEL BUS ASSOCIATION	0609327...	justice.mkhaliphi@gmail.com	
4	AYANDA FUNENE	DE ADD Chair		0725...	Ayanda...@gmail.com	
5	Ernest Ngovene	DBP & SPYC	DAVEL ... Trading	066 4627681	davel...trading@gmail.com	
6	Jabu Manana	DBA	Unemployment ...	071...	JabuManana35@gmail.com	
7	ANTHONY SINGO	Consultant	Singo Consulting	0766784245	anthony@singoconsulting.co.za	
8	Livhuwani Siguwathi	Consultant	Singo Consulting	0766520062	livhuwani@singoconsulting.co.za	
9	Tendani Singo	Consultant	Singo Consulting	0769939006	Tendani@singoconsulting.co.za	
10	[illegible]	Consultant	Singo Consulting	0766074661	[illegible]	
11	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
12	G. R. MBHAMBA	CHAIR	GRASPAN RESI	0760525785	zamagalene702@gmail.com	
13	SYDWELL R. MABUSE	MCC		0787898213	sydwellmabuse@gmail.com	
14	Nathi Mnambela	Forum Secretary	Sihawelindwaluzi	0636037...	nathimay85@gmail.com	
15	Sammy Ntsolo	Site ...	Sk Phambili	0647035609		
16	SIPHO MOKOENA	Member of Comm	Mangwane ...	0766792178		
17	AMOS MAHAMBA	Secretary	Graspan Resi	0711358809	m...@gmail.com	
18	DOCTOR SIMELANE	Chairperson	Graspan	0726143234		
19	Siyabonga Mashigo	Consultant	Singo Consulting	079 177 8410	siyabonga@singoconsulting.co.za	
20	Masindi Nepfale	Consultant	Singo consulting	076 5248499	masindi@singoconsulting.co.za	
21	Sizwe Nkosi	MCC Chairperson	Unemployment ...	072 3605147	nationnosi@gmail.com	
22	Mthokozisi Mkhwanazi	MCC	Siphayinkosi ... Pty Ltd	076 ...	Mcmakhwanazi@gmail.com	
23	Simphiwe Thango	Davel Forum	Davel Forum	0838599366	SPMthango@gmail.com	
24	Mzwandile Mbebeca	DRP Comm...		0609717005		
25						

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
26	Tsepo Malumane	Forum	Sango consulting	0716799451	malumanebd@gmail.com	
27	Nokuthula Nkosi	Consultant	Singo Consulting	0766...	nokuthula@singoconsulting.co.za	
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2. Proof of Appendices

----------THE END----------

MEETING WITH THE DAVEL COMMUNITY AND THE CONSULTANT FIRM AT DAVEL COMMUNITY HALL IN ERMELO, MPUMALANGA.

Date: 12th of July 2019

Time: 11:00 am

Venue: Davel Community Hall, Ermelo

Attendee: (Refer to Attendance Register)

Client (s): Increadable Berachot Mining & Traders (Pty) Ltd

Apologies: Absence of clients

Opening: Prayer by Bongani(Community member)

AGENDA:

Programme Director: Mr. Justice Mkhaliphi

Interpreter: Ms. Nokuthula Nkosi

Introduction: Mrs. Masindi Nefale - Singo Consulting (Pty) Ltd.

Meeting Objective

- Background of the proposed project – Mr. Siyabonga Mashigo
- Progress of the Specialist Studies – Mr. Kenneth Singo
- Update on the Water Use License Application - Mr. Anthony Singo
- Description of Rehabilitation Studies – Mr. Livhuwani Sigwadi
- Community Forum – Ms. Nokuthula Nkosi
- Social and Labour Plan - Ms. Tendani Singo

Question/Answer Session

Closing

Matter of the day:

Introduction done Justice Mkhaliphi
We are joined by Singo Consulting (Pty) Ltd to do a follow up of the meeting tat we held here last year about the proposed mine on the farm Graspan 222 IS. We are also joined by Mr. John Blose our ward 10 councillor here in Davel. They are here today as part of the public participation process to inform us of the development of the project. We agreed in the chamber that we will carry forth with the agenda that they have prepared. Kindly ensure that you have singed the circulating
Introduction of Singo Consulting done by Mrs. Masindi Nefale
Apologies on behalf of the applicant as they had other commitments that had to be attended. We at Singo Consulting are based in Witbank near Highveld Mall. The company was established in 2008 and has 15 employees. The services rendered by Singo Consulting deal with mining issues such as: • Mining and prospecting applications • Mining feasibility studies • Exploration geotechnical studies • Public participation • Environmental impact assessment • Environmental management plans • Hydrological and geohydrological studies • Social labour and community development • GIS services. My team has joined me today as part of the public participation process. We are all consultants namely:

- Mr. Kenneth Singo
- Mr. Anthony Singo
- Ms. Tendani Singo
- Mr. Livhuwani Sigwadi
- Mr. Siyabonga Mashigo
- Ms. Nokuthula Nkosi

Presentations

Background of the proposed project – Mr. Siyabonga Mashigo

The project location is based on Farm Graspan 222 IS portion 10 and the life expectancy of the mine is 30 years.

The Mining Right Application is a long process that requires numerous specialist studies to be conducted. So, the mine will not operate until all the studies and processes have been followed.

There are different stages in the proposed project the first being prospecting where the land is drilled in search of coal. The results gathered from the drilling process are taken to the lab for further analysis. The results are reverted, and a decision can be made as weather the coal will be feasible or not.

The second phase is scoping where we search the area for the attributes that could be affected and evaluate the impacts that the proposed mine might have on the community, businesses, infrastructure and the environment and how these impacts will be mitigated.

That report is compiled and submitted to DMR and after approval we move on to the next phase which is mining right which is the phase we are currently on. An EIA report will be compiled based on the studies done by our specialist.

Progress of the Specialist Studies – Mr. Kenneth Singo

Previously we visited for the scoping process where the studies required to be in the EIA report were identified. We identified that the mine will affect the topography, loss of soil characteristics, a change of land use from agriculture to mining, there will be water pollution, increase in traffic and influx of job seekers.

We proposed to DMR that the following studies must be undertaken to mitigate the impacts:

- Agricultural impact assessment where we investigate what agriculture is currently doing and progressing in comparison to the proposed mine
- Biodiversity study where we assess the animals on site and the vegetation
- Blasting and vibration where we assess who is the most affected community
- Emergency preparedness plan and risk assessment
- Surface water and storm management plans

After compiling the reports, drafts will be available at the libraries for the community to comment and review. From 4th August 2019 till 2nd September 2019is the review period where you send in

your comments. On the 5th of September we will submit and if we get approval, the mine will be granted.
Update on the Water Use License Application - Mr. Anthony Singo
I'll present the status of the water use license that needs to be applied for before the mine commences. Note that the mine will not operate until the water license is granted. At the moment the application has been lodged to the department of water and sanitation and we are still awaiting their response. The water use license application runs for 300 days. Within the application within the application we have specialist studies that need to be conducted such as: • Surface water study • Geohydrological water study • Water balance (availability of the water around the site and the consumption that the mine will require) After the studies have been conducted, the reports are submitted to the department of water and sanitation. Thereafter the department assesses the repots and decide upon the gathered information.
Description of Rehabilitation Studies – Mr. Livhuwani Sigwadi
The reason for conducting the studies is to check the current status of the land. It is a requirement from DMR that the applicant rehabilitate the land after mining operations are finished. The plan shows how the land will be taken back to its initial state so that the activities that are currently taking place will continue to take place after mining.
Community Forum – Ms. Nokuthula Nkosi
DMR requires that there be a recognised community forum that has been elected by the community so that if there is any information that needs to be communicated to the community, they will communicate via the community forum. You as a community have 30 days to discuss amongst yourselves thereafter revert with a formal letter containing the contact information(Name and surname, cell phone number and email address) this information will be submitted to DMR along with the reports.
Social and Labour Plan - Ms. Tendani Singo

The Social Labour Plan is a document that the applicant needs to draft and submit to DMR when applying for a mining right. It outlines the community needs and needed establishments. This includes:

- Improving their lives
- Upgrading of roads
- Local schools

And so forth.

We have the draft for the SLP that will be available for review along with the other documents so that everyone may have a say and input their ideas/comments, so we know how you want us to update that document.

You may find that there are people in the community that have mine equipment/machinery etc. I suggest that you go register all that information with the forum that was previously presented so that when that equipment is needed the forum will have that information and we can come to you first before outsourcing.

Questions and Answers

Issue raised/ Comments	Response	Actions
Mr. Simalene: When will the mine start operating and when will the hiring process begin?	Mr. Singo (NK): the final report will be submitted on the 5th of September 2019 and DMR has 30 days meaning there will be feedback in October. But this is applicable if they are only working on this file (but there are other applications they are working on so we will hear from them.) on the results thereof.	Noted
Mr Kunene: Were the occupiers on the farm consulted? Did you consider that we should be part of management and share distribution?	Mr. Mkhaliphi: the Graspan residents couldn't make it to this meeting. Mr. Singo(NK): the shares and ownership need to be addressed in the SLP so you need to discuss as the community, propose to the municipality and the must approve.	Noted.

Ms. Ntombi: This is an important meeting what happed as there is a minimal number of community members. Was the councillor consulted?	Mr. Singo (NK): we put notices around Graspan, and we have advertised in the paper and that is the legal way of inviting people for the meeting.	Noted
Mr. Mkhalipha made it a note that questions should be based on the presentation of the speaker so that he/she can respond accordingly.		
Mr. Ngamane: May the phases be explained and focus on mining right as that is the phase that we are on.	(Mr. Mashigo explained the phases again as per his presentation.)	Noted
Mr. on the BID on page 12, there will be documents that will be submitted to Hendrina and Ermelo public library so please include Davel public Library.	Noted.	Noted.
Mr. Simelane: the people on Graspan aren't present for this meeting. Is this the same company that came last year and stated that there would be more meetings but did not come back? While the mine operates do farming activities stop?	Mr. Singo (NK): with regard to the follow up meetings, we work according to the mandate of our client. If the client says put the project on hold due to financial constraints, we cannot come. We engaged with Mr. Mkhaliphi to tell his that we'll come back when the client is ready hence, we are here today. I can say that we will be back in 35 days but if the client puts the project on hold again due to finances then we will not come. The social labour plan was drafted based on the client's ideas, now they want the community to have an input. The SLP that will be submitted should have a municipal supporting letter meaning, the community forum that will be formed will sit down with the community and agree on your needs. That letter must then be taken to the	Noted.

	municipality and if they are satisfied with the proposal, they will issue a supporting letter and that SLP is stamped for submission to DMR. Regarding farming activities, the mine will start as a surface operation which will cover 20 hectares, the remaining 350 000 hectares will be underground so farming will continue when they are underground.	
Mr. Sizwe: as the water use license is said to run for 300 days, when was that application lodged and how far along is it? When is the forum going to be appointed?	Mr. Singo (NK): the client didn't run the WULA parallel to the mining right so the WULA is currently on 60 days. Meaning that the department may grant the mining right, but the mining operation will not start until the decision for water use license is given. So, the mine may start possibly June 2020.	Noted.
Person 1: How many people should be in the community forum?	Mr. Singo (NK): In the forum you need to elect one neutral person that is the go-to between the department and the community. They need to have a cell number, email and fax. When the mine is hiring, they will communicate with that elected person and that person will communicate with you as the community.	
Mr. Ngomane: does this mean that the mining license will not be issued if these studies are not conducted? About the forum, it needs to be a registered organisation which meets the requirements. A forum usually consists of 15 people, 5 executives and 10 additional members.	Mr. Singo (NK): Noted. We were under the impression that the Sinokwanda Agricultural and Mining Cooperation led by Ms. Magagula, Mrs. Mbazo and Mr. Skosana as they told us that they are representatives of the community on the farm. But as of today, we have the correct structure going forward as to who should be contacted.	Noted.

I'd like to correct the perception that the mine only affects the people on Graspan 222 IS. The mine is in our district of Msukaligwa and part of Davel ward 10 and other surrounding areas. So even though they are not all present today, we are all interested and affected parties. Please also share the documents for review at our library in Davel. Please clarify the deadlines for review.		
Person 2: May you please make means so that everyone has the BID and can comment and register as an interested and affected party. In addition, the t statement made about the forum, may you give us guidelines from the DMR to the forum as to what the requirements are in terms of the documents needed and so forth.	Noted.	Noted.
Mr. Mahamba: Singo is consulting for IBM&T but we need IBM&T to assure that things like the SLP are headed by them as the company to avoid false promises.	Mr. Singo (NK): We are only here to address you and ask you to raise your concerns so that they can be registered. DMR will make the decisions based on your concerns, not us. We as the consultants are not involved in an SLP, it is your input. After the identification of the forum, they will have the SLP to live by when the mine operates and we, the consultants, will no longer be present.	Noted.

Person 3: will there be an incentive for the people in the forum or will it be volunteering work? If there is no incentive, why?		Noted.
Person 4: An invitation should come from the community to say they should come and address us?		Noted.
Person 5: Let me shed light on the forum, there are 15 members. 5 are leaders, 10 are assistance to the leadership. What did the applicant have to say about their absence at today's meeting as we are communicating with you as the consultants, but you are not the ones mining ?	(The gentleman arrived late and missed the apologies given by Mrs. Nefale at the beginning of the meeting)	Noted.
The issue of the community forum sparked uneasiness. Mr. Blose then interjected to state that he advises that there will be a local economic development subcommittee that will be under the forum that will be headed by the mayor of Msukaligwa which did not sit well with the Davel community as that meant that outsiders would be benefiting from a project that directly affects the community when they live out of Davel. He then withdrew his suggestion and stated that the community should then head the forum that is required by DMR to which the community agreed. The Remaining questions couldn't be addressed as the commotion on the hall grew and became physical thus forcing the consultants to adjourn the meeting and exit.		
WAY FORWARD		
It was agreed that all communication will include Mr. Blose as the ward councillor so that he passes the information on to the community that he is leading. The consultants will further consult Mr. Blose and a follow up meeting will be held.		
End-of-Minutes		

3. Attendance Register:

Phase 2- Meeting

SINGO CONSULTING (Pty) Ltd
Meeting venue: DAVEL Community HALL
Date: 12-07-2019
Time: 11am – 12:40PM

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
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Phase 2–

SINGO CONSULTING (Pty) Ltd
Meeting venue: Bavel Hall
Date: 12-07-2019
Time: 11am – 12:40pm

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
1	Sicelo Makwanazi			0766014150		[signature]
2	Elvis Mkhabela			0662568852		[signature]
3	Mabusane Nkosi			0736723179		[signature]
4	JABULANE MHLANGA		Community	0761246703	jjmhlanga@gmail.com	[signature]
5	Vusi Masilinini		Comm. Member	0630021625		[signature]
6	Bongane Nkosi		Community			[signature]
7	Mamikie Jonker		Class/Community	0663002748	N/A	[signature]
8	Nokuthula Buthelezi		Class/Community	0733440866	N/A	[signature]
9	Nancy Thugwana		Class/Community	0605761597	N/A	[signature]
10	Eunice Moisi		Class/Community	0714116561	N/A	[signature]
11	[illegible]		Community	0713162108	[illegible]	[signature]
12	[illegible]		Community	0716059665	N/A	[signature]
13	Lindokuhle Dladla		Community	0608615761	[illegible]	[signature]
14	Joshua Mkhaliphi		Community			[signature]
15	Mbongeleni Mhlophe		Community	0795400606	N/A	[signature]
16	Wonder Nubi		"	0717104359	N/A	[signature]
17	Sifiso Nkosi		Community	0799461311	N/A	[signature]
18	Sicelo Moisi		Community	0792332810	N/A	[signature]
19	[illegible]		Community	0763109987		[signature]
20	Nombuso Mohlalose		Community	0718093550		[signature]
21	Solomon Mathebula		Community	0780355720	N/A	[signature]
22	Nomvula Mashinini		Community	0723130544	N/A	[signature]
23	Simphiwe Mahlangu		Community	0660938705	N/A	[signature]
24	Nokuthula Dlamini		Community	0823461843	N/A	[signature]
25	N Thembo Mthethwa		RESIDENT	0607630321	N/A	[signature]
26	Mlungisi Dlamini					
27	Benjamin		RESIDENT	0723937165	N/A	
28	Thabiso Mukhobobujane		Community	0783939465	N/A	M.H.[illegible]
29	Nomthosi Jende		Class Community	0609730179	[illegible]@gmail.com	[signature]
30	Busisiwe Maseko		//	0633330834	nomthosimaseko@gmail.com	[signature]
31	Bongane Zondo		//	0782830322	N/A	[signature]
32	Mabaso Bantso		Community	0661771128	N/A	[signature]
33	Lindo Ncongwane		Community	0603823156	N/A	[signature]
34	Livhuwani Sigwane		Community	[illegible]	N/A	[signature]
35	Sidwell R Mabuse		eMbalenhle	0766828062	Lutuwani@SingoConsulting.co.za	[signature]
36	Thabo [illegible]		0787878215	MCE	Sidwellmabuse@gmail.com	[signature]
37			0609730179	060978017	[illegible]@gmail.com	[signature]
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4. Proof of Appendices

----------THE END----------

MEETING WITH THE GRASPAN COMMUNITY REPRESENTATIVES AND THE CONSULTANT FIRM AT SINGO CONSULTING IN EMALAHLENI,MPUMALANGA.

Date: 1st of August 2019

Time: 15h00 am

Venue: Singo Consulting Boardroom, eMalahleni

Attendee: (Refer to Attendance Register)

Client (s): Increadable Berachot Mining & Traders (Pty) Ltd

Apologies: Councillor Blose was supposed to join us to represent designated people

Meeting Objective

- Propose Meeting with the Graspan 222 IS Residents

Question/Answer Session

Closing

Matter of the day:

Introduction of Singo Consulting (Pty) Ltd done		
The meeting was meant to be held with the councilor of ward 10, however he was not available to attend the scheduled meeting which then was arranged to be postponed and be held in his presence.		
Questions and Answers		
Issue raised/ Comments	**Response**	**Actions**
Mr. Simelane: I think it would be best if a meeting was held with the residents of Graspan 222 IS so that they are aware of the proposed project and have all the relevant information.	Mr. Singo (NK): That is not a problem. We can arrange meeting. How many people are residing on the farm so that we can prepare for the meeting?	Noted

Mr. Simelane: Maximum 30 people		Noted
Mr. Simelane: Yes Mrs. Ndlovu: There is a division with the Sinokwanda people. They are tenants and are claiming the land. Mr. Simelane: we are busy speaking to them, the matter has been taken to court and that is why the Sinokwanda group want a special meeting. Had they been fair, they would have come to the meeting with the others and sort the mess out but they refuse to engage. If they refuse to come to the up coming meeting, it is not a problem but please meet with the community on the farm. Mr. Simelane: Alright it is clear. Let us finalise the upcoming meeting. Mr. Simelane: Weekends accommodate everyone Mr. Simelane: We will discuss with the community and revert with the final decision. Mr. Simelane: We will also invite the councillor.	Mr. Singo: Are the residents of Graspan aware of the Sinokwanda group? Please rectify this as it appears that they are recognised and have a lease Mr. Singo (NK): We will try caling them to the meeting. The information we have states that they are recognised and have a lease of 30 years. So, we ned to understand how the small group became recognised. That farm belongs to land affairs and is leased to the Sinokwanda group. This means that by law we should talk to land affairs and the lawful occupiers who are Sinokwanda. Mr. Singo (NK): it is important that such information is brought to light because in this situation honestly speaking, you will not be recognised. So the procedure for consultation goes as follows. It's the landowners, lawful occupiers then lastly community. Hence proof is needed from you that states your position so that DMR will recognise you. Mr. Singo (NK): Which days are suitable for to hold the meeting. Mr. Singo (NK): Mr. Simelane are you one of the community leaders whom will be able to address the community and	Noted

	explain why the meeting is held over the weekend to avoid unnecessary squabbles Ms. Shonisani: Let's make it the weekend of the 10th August 2019 at 10:00 am so we have enough time to alert them. Mr. Singo(NK): please assist us in notifying the people e.g. via loudspeaker and so forth.	
	Mr. Singo (NK): Please prepare your questions so we can answer. Normally when we hold meetings, the community assumes that we will decide there which is not the case. We record the minutes and DMR will have the final say based on their comments and research about the area. We don't expect fights but a smooth informative meeting. The applicant will be present as well as the consultants.	Noted.
WAY FORWARD		
Mr. Singo (NK): kindly find out if we can have a stand meeting or whether we should hire chairs to accommodate the elderly and so forth.		
End-of-Minutes		

1. Attendance Register:

Graspan Community Reps

SINGO CONSULTING (Pty) Ltd
Meeting venue: SC OFFICES
Date: 01- 08- 2019
Time: 15h00

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
1	Rudzani Shonisani	Consultant	Singo Consulting	0785461244	rudzani@singoconsulting.co.za	
2	JOHN MTSHWENI			[illegible]		
3	DOCTOR SIMELANE			0726143234	–	
4	Lucky Mtsweni			0792335264		
5	[illegible]			0795483423		
6	Singo Kenneth	Consultant	Singo Consulting	0782727839	Kenneth@singoconsulting.co.za	
7	SINGO Anthony	Hydrologist	Singo Consulting	0766764348	anthony@singoconsulting.co.za	
8	ALLAN DUROY	APPLICANT	IBM	0711288994	duroy2002@gmail.com	
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---------------------------------------THE END---------------------------------------

INCREADABLE BERACHOT MINING & TRADERS (PTY) LTD

WULA SITE VISIT MINUTES

Date: 30th July 2019

Time: 10:00am

Location: Singo Consulting (Pty) Ltd office.

<u>ATTENDEES:</u>

DWS: | Gloria Moloto | Nompumelelo Mandlazi| Isaac Tlagadi

Singo Consulting (Pty) Ltd: | Singo Kenneth | Singo Anthony | Munyai Mutshidzi

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Project description: WULA process for the Increadable Berachot Mining & Traders (Pty) Ltd, mining right at Portion 10 of the farm Graspan 222 IS located in the Magisterial District of Ermelo, Mpumalanga.

Site visit description:

- The department of water and sanitation (DWS) representatives requested to see the available pans and drainage lines within the mining right area.
- The DWS representatives made remarks on the pans, the sections to apply for, relevant studies required and assessment of the site in general.

The DWS representatives' remarks:

- The pan to be regulated should be within 500m from the Boxcut, all the pans should be included in the mining layout plan as well as all the water courses found within the project area with flood lines, should be presented on the layout map.
- The specialist's studies should indicate the amount of water that will be dewatered, and the amount of water that is needed to wash the coal.
- The PCD designs must be presented at head-office.
- The capacity of the PCD should be included in the water balance.
- Qualities of water to be put in the PCD should be determined and they recommend that the mine use this water from the PCD for dust suppression.
- Baseline water monitoring must be conducted at least once a year.
- There must be a stormwater management plan
- The clean water trenches do not need authorisation
- Flood lines delineations must be done
- If there is a pan within 500m from the Boxcut, pedological study must be done.
- Public participation must be part of the water use application process.

Section 21(a) to be applied for the following proposed activities:

- Borehole which will be used for domestic purposes
- Coal washing plant as its re-use of water for processing.

Section 21(j) to be applied for the following proposed activities:

- Dewatering from the pit
- Dust Suppression
- Discard dump

Section 21(g) to be applied for the following proposed activities:

- Storage of contaminated water in the PCD

- Product stockpile
- Conservancy tanks
- Overburden

Section 21(c and i) to be applied for the following proposed activities:

- To be applied only if the wetland is within 500m from the Boxcut.

Minutes prepared by:

Singo Consulting (Pty) Ltd

Register

SINGO CONSULTING (Pty) Ltd
Meeting venue: Singo Consulting office
Date: 30/07/2019
Time: 10:00 AM

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
1	Gloria Moloto	CEO GRADE B	DWS: HQM	0663014571	molotom@dws.gov.za	Moloto
2	Nompumelelo Mandlazi	EO	DWS: WAM	013 932 2061	mandlazin@dws.gov.za	[illegible]
3	[illegible] Tlagadi	EO (WQM)	DWS	0609989196	[illegible]@dws.gov.za	[illegible]
4	Kenneth Singo	Consultant	Singo Consulting	078 2727 835	kenneth@singoconsulting.co.za	Singo
5	Mutshidzi Munyai	Hydrogeologist	Singo Consulting	0769244356	mutshidzi@singoconsulting.co.za	[illegible]
6	Anthony Singo	Hydrologist	Singo Consulting	0766764348	anthony@singoconsulting.co.za	[illegible]
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INCREADABLE BERACHOT MINING & TRADERS (PTY) LTD SITE VISIT MINUTES

Date: 25th September 2019

Time: 10:00am

Location: Graspan mining site.

ATTENDEES:

DWS: | Gloria Moloto | Nompumelelo Mandlazi

Singo Consulting (Pty) Ltd: | Singo Anthony | Munyai Mutshidzi

Project description: WULA phase 2 process for the Increadable Berachot Mining & Traders (Pty) Ltd, mining right at Portion 10 of the farm Graspan 222 IS located in the Magisterial District of Ermelo, Mpumalanga.

Site visit description:

- The department of water and sanitation (DWS) representatives requested to see the available pans and drainage lines within the mining right area.
- The DWS representatives made remarks on the pans, the sections to apply for, relevant studies required and assessment of the site in general.
- The pan is located were the mining method will be underground, therefore the DWS representatives suggested that we have another meeting with other DWS representatives who will explain better the regulations that need to be followed when mining under the pans.
- Nompumelelo Mandlazi will set up the meeting with DWS expertise and notify Singo Consulting (PTY) Ltd
- Nompumelelo Mandlazi will open Phase 3 of the WULA.
- Flood lines delineations must be done and included in the specialists studies.

Minutes prepared by:

Singo Consulting (Pty) Ltd

ATTENDANCE REGISTER:

Singo Consulting (Pty) Ltd

SINGO CONSULTING (Pty) Ltd
Meeting venue: Graspan mining
Date: 25 September 2019
Time: 10:00 am
WULA Site Visit

ATTENDANCE REGISTER

No.	Name & Surname	Designation	Company/LandOwner/ Other(Specify)	Contact Details	Email Address	Signature
1	Mutshidzi Munyai	Hydrogeologist	Singo Consulting	0769[illegible]4356	mutshidzi@singoconsulting.co.za	[signature]
2	ANTHONY SINGO	HYDROLOGIST	SINGO CONSULTING	0766764348	anthony@singoconsulting.co.za	[signature]
3	Gloria Moloto	CEO: GRD B	DWS	0663014571	molotom@dws.gov.za	[signature]
4	Mandlazi Nompumelelo	ED	DWS	0710052585	mandlazin@dws.gov.za	[signature]
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Appendix 9: Financial Provision

REGISTER OF I&APS: SPECIALIST REPORTS

Appendix 10: Biodiversity studies

- Vegetation and flora impact assessment
- Avi-Fauna impact assessment
- Fauna impact assessment

Appendix 11: Heritage impact assessment

Appendix 12: Agricultural Impact Assessment Study

Appendix 13: Blasting Assessment

Appendix 14: Geo-hydrological assessment

Appendix 15: Emergency Preparedness and SHE Awareness

Appendix 16: Social impact assessment (risk assessment)

Appendix 17: Storm water management plan and PCD designs

Appendix 18: Traffic impact assessment

Appendix 19: Soil, land capability and land use assessment

Appendix 20: Rehabilitation plan

Appendix 21: Palaeontology study

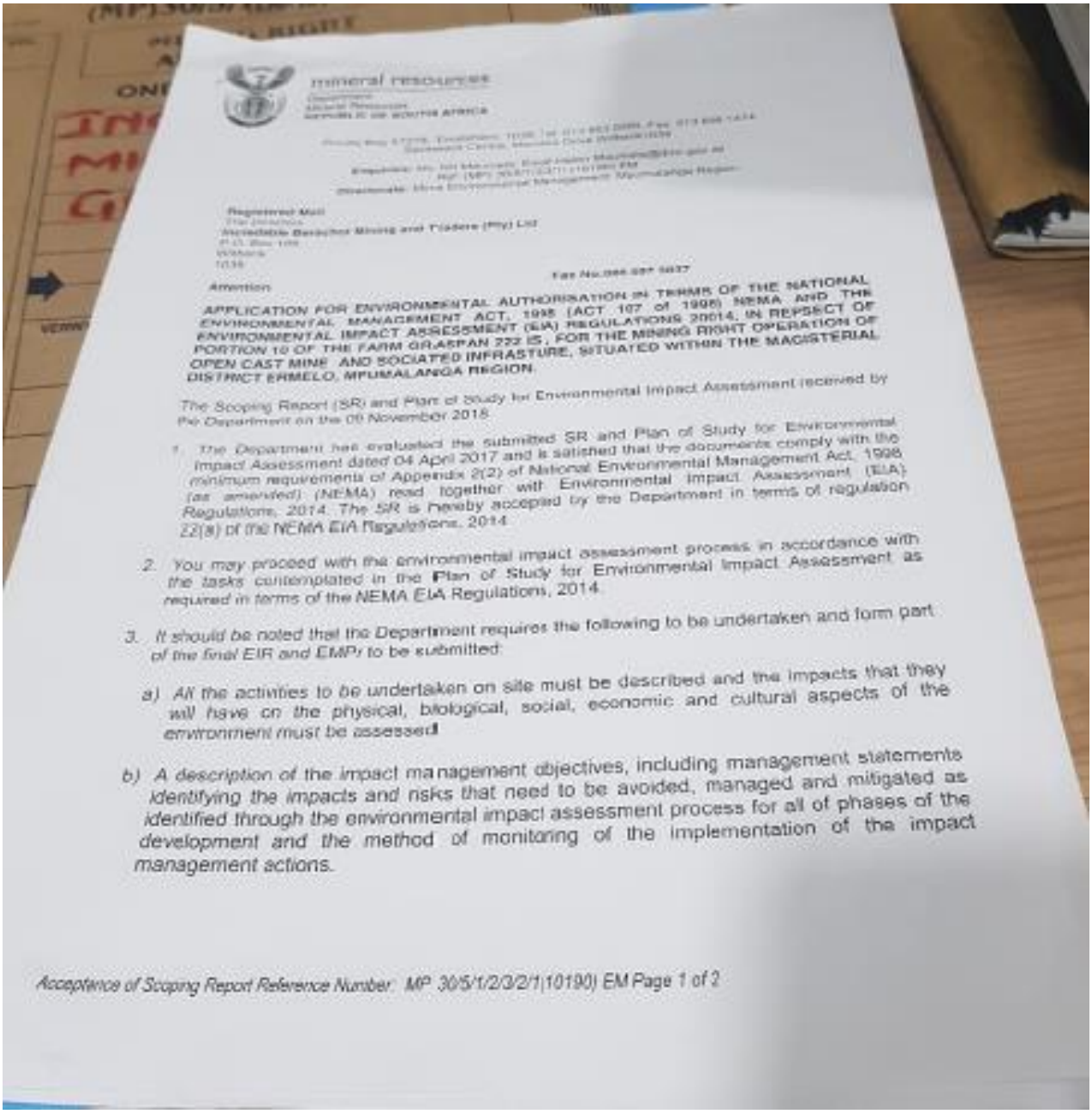
Appendix 22: Mining works programme

Appendix 23: Social and labour plan

Appendix 24: Consulting Report for Public Participation Process.

Appendix 25: Wetland and Delineation Study

Appendix 26: Scoping report acceptance letter



mineral resources

Registered Mail

Attention

APPLICATION FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT 107 of 1998) NEMA AND THE ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS 20014, IN RESPECT OF PORTION 10 OF THE FARM GRASPAN 222 IS , FOR THE MINING RIGHT OPERATION OF OPEN CAST MINE AND SOCIATED INFRASTURE, SITUATED WITHIN THE MAGISTERIAL DISTRICT ERMELO, MPUMALANGA REGION.

The Scoping Report (SR) and Plan of Study for Environmental Impact Assessment received by the Department on the 09 November 2018.

1. The Department has evaluated the submitted SR and Plan of Study for Environmental Impact Assessment dated 04 April 2017 and is satisfied that the documents comply with the minimum requirements of Appendix 2(2) of National Environmental Management Act, 1998 (as amended) (NEMA) read together with Environmental Impact Assessment (EIA) Regulations, 2014. The SR is hereby accepted by the Department in terms of regulation 22(a) of the NEMA EIA Regulations, 2014.

2. You may proceed with the environmental impact assessment process in accordance with the tasks contemplated in the Plan of Study for Environmental Impact Assessment as required in terms of the NEMA EIA Regulations, 2014.

3. It should be noted that the Department requires the following to be undertaken and form part of the final EIR and EMPr to be submitted:

a) All the activities to be undertaken on site must be described and the impacts that they will have on the physical, biological, social, economic and cultural aspects of the environment must be assessed.

b) A description of the impact management objectives, including management statements identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all of phases of the development and the method of monitoring of the implementation of the impact management actions.

Acceptance of Scoping Report Reference Number: MP 30/5/1/2/3/2/1(10190) EM Page 1 of 2

...sible and reasonable alternatives based on the different types/categories of alternatives must be identified and assessed, so that the Department can be able to make an informed decision.

d) Public Participation Process must be transparent and all comments received during the process must be incorporated into the comments and response report of the final Environmental Impact Report.

e) Proof of correspondence with the various stakeholders must be included in the EIAR. Should you be unable to obtain comments, proof of the attempts that were made to obtain comments should be submitted to the Department.

f) All comments from interested and affected parties must be adequately addressed in the final Environmental Impact Report.

g) For linear activities such as roads and pipelines, a description of the co-ordinates of the corridor in which the proposed activities are to be undertaken. The impacts of these linear activities must be thoroughly assessed.

h) A motivation for the need and desirability of the project must be included.

4. The applicant is hereby reminded to comply with the requirements of regulation 3 of the EIA Regulations, 2014 with regards to the time period allowed for complying with the requirements of the Regulations.

5. You are requested to submit two (2) hard copies of the EIAR and EMPr and at least one electronic copy (CD/DVD) of the complete EIAR and EMPr to this Regional Office.

6. Your attention is brought to Section 24F of the NEMA which stipulates "that no activity may commence prior to an environmental authorisation being granted by the competent authority".

Yours faithfully

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REGIONAL MANAGER: MINERAL REGULATION
MPUMALANGA REGION

DATE..14/12/2018.....

...ptance of Scoping Report Reference Number: MP 30/5/1/2/3/2/1(1019) EM Page 2 of 2