mineral resources
Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND MINING

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

NAME OF APPLICANT:	**Wepex Trading (Pty) Ltd**
REFERENCE NUMBER	**(NC) 30/5/1/1/3/2/1/10186 MR**
TEL NO:	**0607852780**
FAX NO:	**0865767057**
POSTAL ADDRESS:	**Postnet Suite 246** **Private Bag X43** **SUNNINGHILL** **2157**
PHYSICAL ADDRESS:	**24 Nanyuki Road** **27 Sunninghill Brooke Estates** **SUNNINGHILL** **2157**

FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/2/2/10186 MR**

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.

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process:-
   a) identify the relevant policies and legislation relevant to the activity;
   b) motivate 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 and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
   d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
   e) identify the key issues to be addressed in the assessment phase;
   f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
   g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SCOPING REPORT

2) Contact Person and correspondence address:

a) Details of:

i) The EAP who prepared the report:

Name of the Practitioner	:	Roelien Oosthuizen
Tel No.	:	087 527 0713
Fax No.	:	086 510 7120
e-mail address	:	roosthuizen950@gmail.com

ii) Expertise of the EAP:

(1) The qualifications of the EAP:
(With evidence attached as Appendix 1)

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)

(2) Summary of the EAP's past experience:
(Attach the EAP's curriculum vitae as Appendix 2)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc.
See attached CV.

b) Description of the property:

Farm Name:	Remaining Extent of the Farm Gloucester 674, situated in the magisterial district of Kuruman
Application area (Ha)	1165.8 (One thousand one hundred and sixty five comma eight hectares in extent
Magisterial district:	Kuruman, Northern Cape Province
Distance and direction from nearest town	The farm is situated ±28 Km north of Postmasburg and ±54.7 km south of Kathu along the R325 provincial road.
21 digit Surveyor General Code for each farm portion	**C041000000067400000**

c) **Locality Map:** (show nearest town, scale not smaller than 1:250 000 attached as Appendix 3)

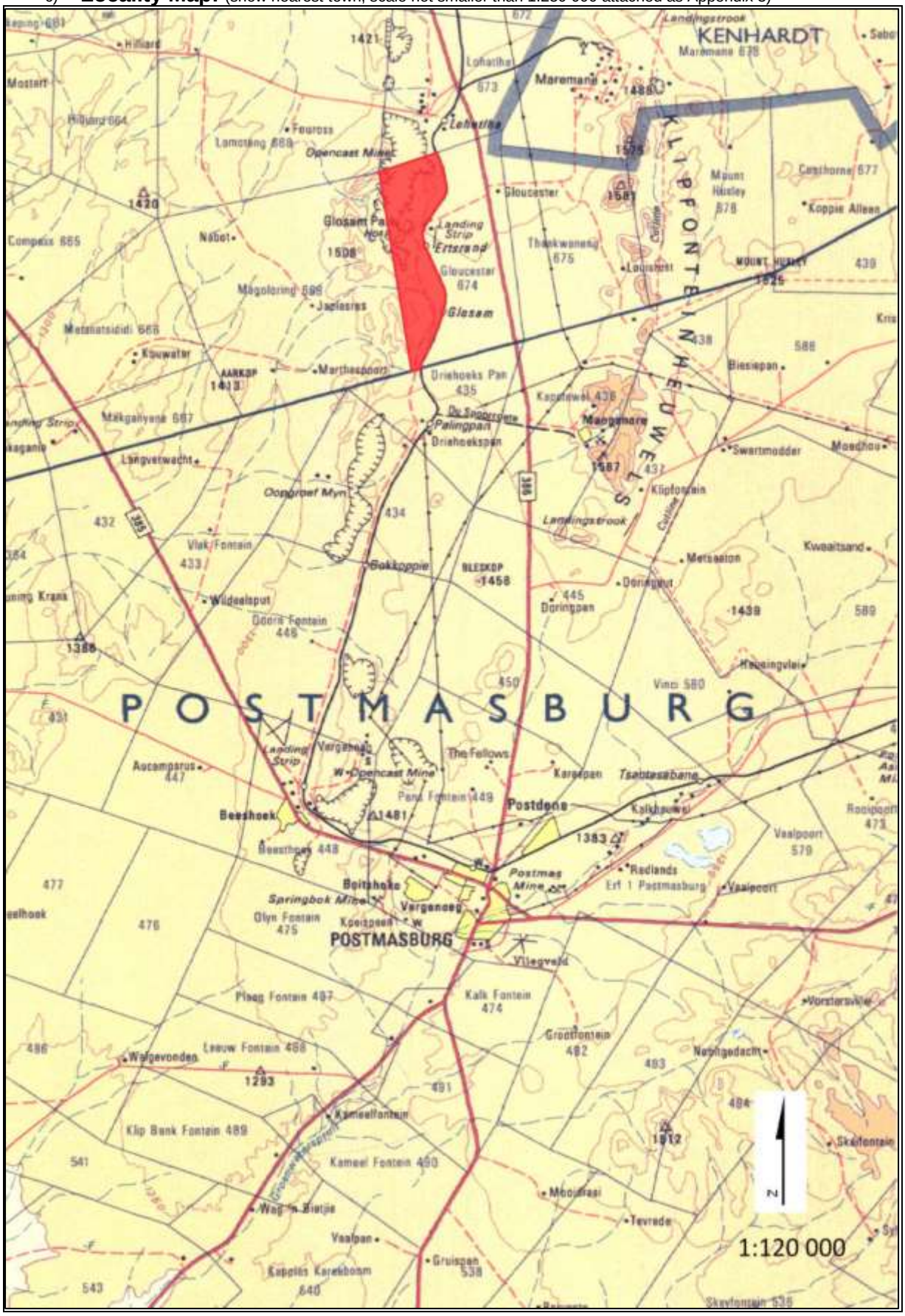

Figure 1. Locality Map 1:120 000 indicating the mining right application area in red.

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

i) Listed and specified activities:

(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)

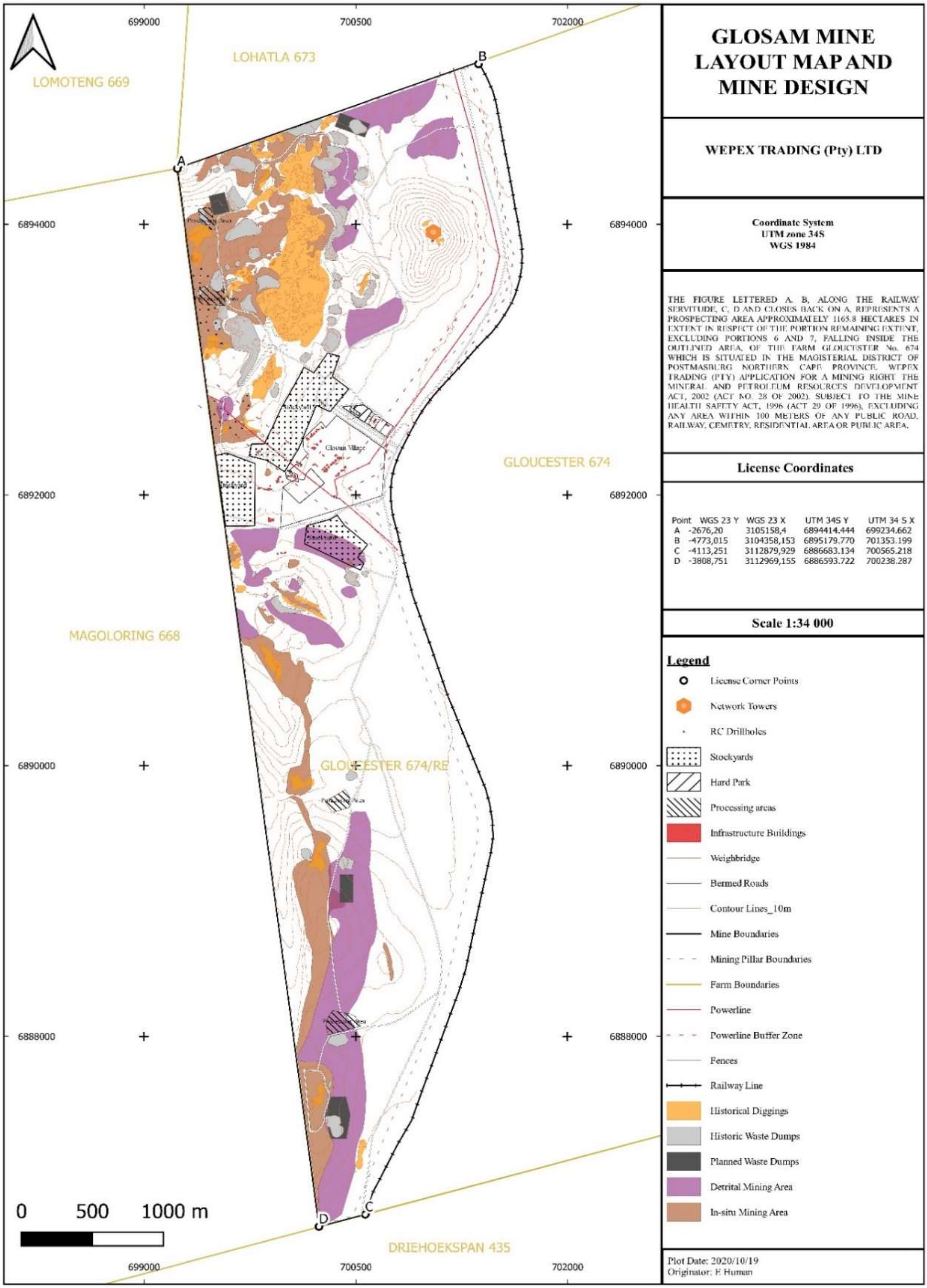

Figure 2. Infrastructure and pit design

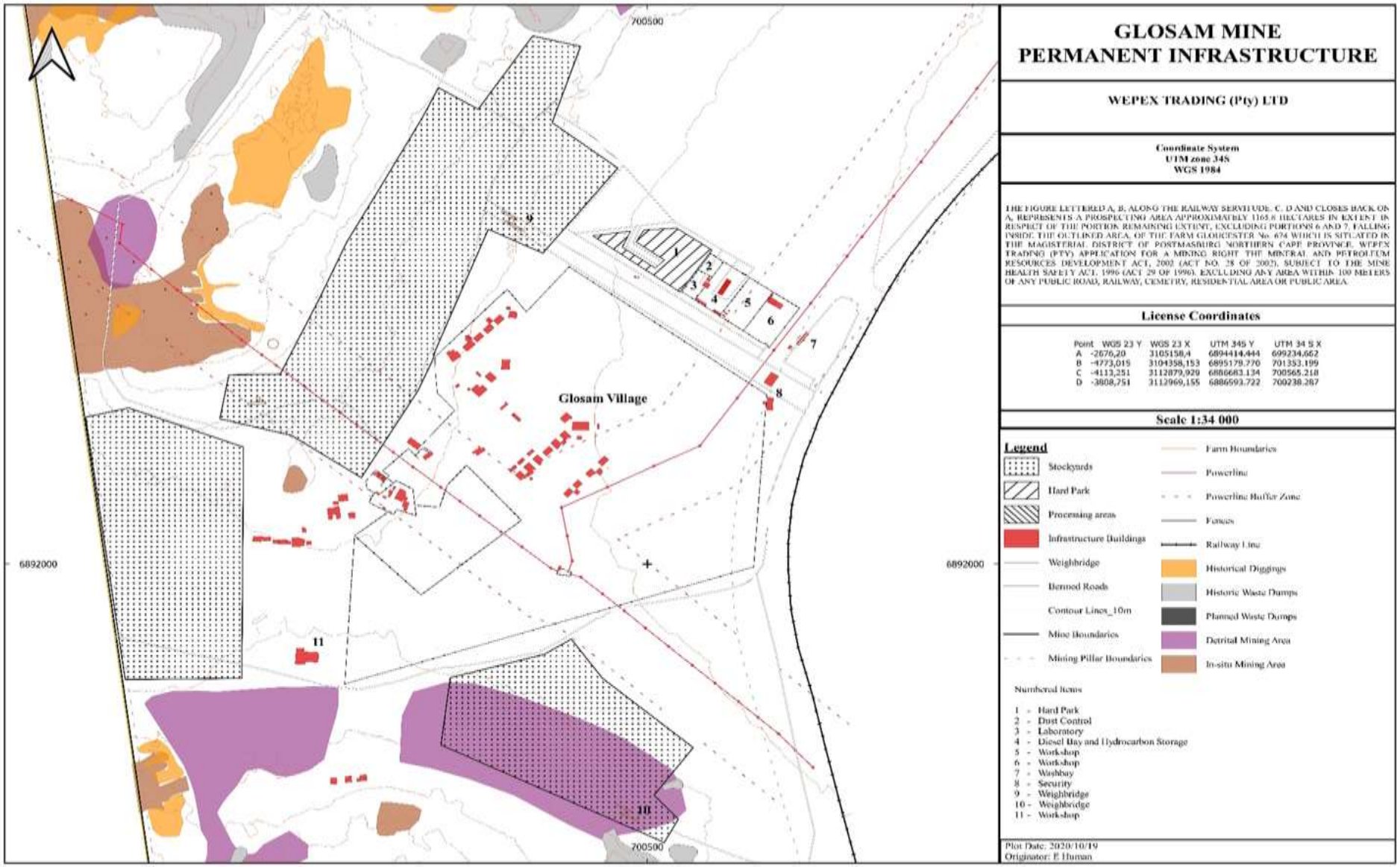

Figure 3. Layout of permanent infrastructure.

Table 1: Listed and Specified Activities

	Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR983, GNR984, GNR985/ Not listed)
1	Blasting: The mine may if necessary, blast blocks with a typical dimension of 25-meter x 50-meter x 10 meter. A mining block will typically have 128 holes with a hole diameter of 165-171mm, a depth of 10 meter with a sub drill of 1 meter. Eleven blocks will be blasted on average per month. Blasting will be conducted once a week when the mine is in full production. Approximately 164kg of explosives is placed in one blast hole.	The size of the blasts will be determined if and when necessary by the practical blast block design and the production rate required from the mine.	X	GNR325[1]: Activity 15: "*The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-* *(i) The undertaking of a linear activity; or* (ii) *Maintenance purposes undertaken in accordance with a maintenance management plan.*" GNR325: Activity 17: "*Any activity including the operation of that activity which requires a mining right [section 22 of MPRDA], including-* a) *infrastructure, structures and earthworks, directly related to the extraction of a mineral resource …*"or *b) the primary processing of a minerql resource including winning, extraction, classifying, concentrating, crushing, screening or washing;* *but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the*

[1] Listing Notice 2

				mineral resource in which case activity 6 in this Notice applies. GNR 327: Activity 30: "Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)."
2	Explosive Magazine: The mine may need two magazines to store the different explosive products namely • 200 case detonator ad accessories magazine (3 meter x 6 meter) • 200 case explosives magazine (3 meter x 6 meter) The magazine area will be fenced to comply with the guidelines set out by the Chief inspector of Explosives (CIE). The fence must be further than 10 meter away from the magazine. The CIE determines the safety radius necessary, but the typical approved radiuses have been • 90 meter for the inner radius • 180 for the outer radius No structures are allowed in the area contained by the inner radius and only structures approved by the CIE, for example a guard house, will be allowed in the area contained in by the outer radius. The construction of the magazines and the safety and security measures for the magazines and the magazine area are regulated by the Explosives Act.	This will only be indicated on the layout plan when and if it becomes necessary. 50m x 40m = 2000m² Inner radius area = 3.14 x (radius squared) = 25 434 m² Outer radius area = 3.14 x (radius squared) = 101 736 m² (10.1736ha)		GNR 327: Activity 27 "The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan." GNR325: Activity 17 (Keep in consideration Mine Health and Safety Act, 29 of 1996 and regulations specifically Section 23.4(o) and Regulation 4, as well as Explosives Act 15 of 2003).
3	Sewage facilities x 2 Ablution facilities	Footprint included into the office space.	X	GNR 327: Activity 25: "The development and related operation of facilities or infrastructure for the treatment

				of effluent, wastewater or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres."
4	Clean & Dirty water system: Stormwater dam It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.	The size and length of the berms, trenches and stormwater dam will be directly affected by the topology of the area and the locality of the infrastructure. During the development of the infrastructure plan provision was made for an area of 45m x 35m as part of the plant area to create different dams for fresh water, process water and water from sewage plants and oil separator (specific capacities for these dams have not been calculated).	X	GNR 327: Activity 12: " The development of— (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; The development of- i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—

				(a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse" Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) GNR325: Activity 17 Consideration of GN704 – MPRDA
5	Fuel Storage facility (Diesel tanks): It is anticipated that the operation will utilize 4 x 17 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place. Re-fuel and lube station	5 196m² Fenced off and cleared area Concrete, bricks, and steel 310 m² Bund Walls 600m² Concrete Floor Pipes, concrete, bricks and steel	X	GNR325: Activity 17 GNR327: Activity 14: "The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage good, where such storage occurs in containers with a combined capacity of 80 but not exceeding 500 cubic meters."
6	Mining Area: The mining process will be initiated by drilling of blast holes if necessary. These holes will then be blasted if necessary, where after the ore will be loaded from the open excavations and hauled to the processing plant.	Provision is made for a maximum footprint (at full production) of 3 500 000m² or 350 hectares of open excavations at any one time.	X	GNR325: Activity 15 GNR325: Activity 17
7	Generator: ((8X 30-100 KW)	2m x 1.5m = 3.5m² 3.5m² x 8 = 28m²	X	GNR325: Activity 17

	The mine infrastructure plan made provision for a brick building that will house the generators for power generation on site if power will be generated by means of diesel generators. Electricity will be distributed on site per overhead powerlines as indicated on the infrastructure plan.	Generator, Electric wires/powerlines, building of concrete, bricks and steel		
8	Office 1 x Lab and Diesel bay Office 1 x Lab Building	Weighbridge Offices 2 x100m² = 200m² Lab and Diesel bay Office 150m² Lab Building 120m² Bricks, concrete, doors, windows or pre-fabricated office blocks on concrete	X	GNR325: Activity 17
9	Parking Bay: It is anticipated that vegetation will be cleared in this area and superfine material will be used as groundcover.	100m x 150m = 1.5Ha	X	GNR325: Activity 15 GNR325: Activity 17 GNR327: Activity 30
10	Processing plant: The processing of ore will be a dry process, with the option to convert to a 'wet' process after full production has been reached. Crushing and screening will be done by mobile plants without the construction of any permanent buildings. After full production a semi-permanent separation plant and semi-permanent crushing plant will be constructed.	300m² Steel, concrete, electric wires	X	GNR325: Activity 15 GNR325: Activity 17
11	Roads (both access and haulage road on the mine site): Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the mining operation will create an additional 7-8 km of roads, with a width of 20 meter. The width of the road is based on	Additional mine haul road = 8 000 meter x 20 meter wide = 160 000 m²	X	GNR327[2]: Activity 24(ii): "The development of a road – (ii)with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters."

[2] Listing Notice 1

	an operating width of the haul trucks of 5 meter. Best practice and the guideline from the DMR is to allow for 4 x Operating width of haul truck, in this case 20 meter wide roads. An existing service road providing access to the north and the south of the farm will be upgraded to DMR regulations and be used as the main service road. The current access road next to the railway line is deemed adequate for a service road into the mine.			GNR327: Activity 56(ii): "The widening of a road by more than 6 meters, or the lengthening of a road by more than 1 kilometer – (ii) where no reserve exists, where the existing road is wider than 8 meters…" GNR325: Activity 17 GNR325: Activity 27(iv): "The development of a road— (iv) catering for more than one lane of traffic in both directions;"
12	Salvage yard (Storage and laydown area)	2000m² or 2ha No construction material, area to be levelled with a grader and fenced with a gate and access control	X	GNR325: Activity 17
13	Security Gate and guard house at access control point	675m² Concrete, bricks, steel and levelled parking area.	X	GNR325: Activity 17
14	Product Stockpile area	Provision is made for a maximum footprint (at full production) of 500 000 m² or 5 hectare for the stockpile area at any one time.	X	GNR325: Activity 15 GNR325: Activity 17
15	Ore Stockpile dumps	79 000m² Run of Mine dumps	X	GNR325: Activity 15 GNR325: Activity 17
16	Storage facility : Drill Cores Currently not planned	150m² Concrete and Steel	X	GNR325: Activity 17
17	Stormwater dam	20m x 50m = 0.1 Ha	X	GNR325: Activity 17

	It is anticipated that the operation will construct a stormwater dam.			
18	Mining Area: The mining process will be initiated by drilling of blast holes if necessary. These holes will then be blasted if necessary, where after the ore will be loaded from the open excavations and hauled to the processing plant.	Provision is made for a maximum footprint (at full production) of 3 500 000m² or 350 hectares of open excavations at any one time.	X	GNR324: Activity 12(g)(i)"Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spacial Biodiversity Assessment 2004; (ii) Within critical biodiversity areas identified in bioregional pans."
19	Subgrade stockpile area 5 stockpiles 5 x 1.5 hectare	Provision is made for a maximum footprint (at full production) of 7.5 hectare for this stockpile area at any one time.	X	GNR325: Activity 15 GNR325: Activity 17
20	Topsoil storage area (temporary) Topsoil dumps X3 3 x 0.5 hectare	Provision is made for a maximum footprint (at full production) of 15 000 m2 or 1.5 hectare for this area at any one time.	X	GNR325: Activity 15 GNR325: Activity 17
21	Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low-level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	7 x 20 m^2 = 140 m^2	X	GNR325: Activity 17

22	The rock dump will be rehabilitated by sloping it to an angle of 18 degrees and revegetate it by the end of life of mine. The mine will include the concurrent rehabilitation in future mine planning. Waste will be backfilled into historically excavated areas	Provision is made for a maximum footprint (at full production) of 100 000 m² or 10 hectares for waste rock dumps at any one time.	X	GNR325: Activity 15 GNR325: Activity 17 NEMWA:Category B GNR 633: Activity 11: *"The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right …"*
23	Workshop and Wash bay	245m² Concrete and Steel	X	GNR325: Activity 17
24	Water distribution Pipeline	HDPE Pipes	X	(GNR327): Activity 9 "…"
25	Water tanks: It is anticipated that the operation will establish a minimum of 8 x 10 000 litre water tanks with purifiers for potable water.	3m x 3m = 9m² each	X	GNR325: Activity 17
26	Weighbridge	600m² Concrete platforms/ramps, steel	X	GNR325: Activity 17
27	Weighbridge control room – two offices	2 x 9m x 20m = 360m²(included on mine lay-out plan)	X	GNR325: Activity 17

ii) Description of the activities to be undertaken:
(Describe methodology or technology to be employed, and for a linear activity, a description of the route of the activity.)

- Mining Method:

  Where present, vegetated soil overlying the planned mining area will be stripped prior to mining and stockpiled on a dedicated dump to be used for rehabilitation purposes at a later stage. Mining will be done by the conventional opencast mining method. Access to the opencast mining areas will be provided by a number of haul roads to the crushing and screening plant.

  The overview of the mining method will be an open cast mining whereby the ore will be excavated with excavators, sand removed, the ore loaded onto articulated dump trucks from the open pit and hauled to the crushing and screening plant.

  Production drilling of the mine, if required will utilize a standard hole diameter which will be 165 mm and the hole depth about 20 m allowing for the 15m bench height and 0.5m for sub drilling in ore.

  Loading of waste and ore respectively will use the excavators; ADTs, Front End Loaders and TLBs. Waste material of manganese will be loaded separately on the articulated dump trucks and hauled to their destination.

  Hauling of manganese to the modular crusher and screening plant where the ore will be dumped on the crushing floor for processing through the plant or hauled to the sub-grade stockpile area. The ore will be utilized in the future mine plan for blending purpose. And the waste will be hauled to the permanent waste rock dumps and also to the mined out areas for backfilling purposes.

- Processing Method:

  Technique

  During the mining process overburden (waste material) will be removed from the manganese ore. The manganese ore will be mined selectively to ensure that only on-grade material is transported to the Run of Mine (ROM) stockpile at the plant. The mining equipment selected for the mine will enable the mine to carry out the selective mining process. The selective mining process will be controlled by the mine's geologists. From the mine the manganese ore will be transported to the plant. The plant process is a standard crushing and screening process to create a marketable product with a particle sizing of -100mm +8mm.

  Technology

  The technology applied will be a jaw crusher, a cone crusher (if required) and a multi-deck screen. The final product will have a particle sizing of -100mm to +8 mmm and a manganese content of +28%Mn. A laboratory will be

established on site to supply chemical values for analysis by the geologist for production grade control and final product grade control. The laboratory will utilise an XRF-analyser (x-ray fluorescence) to determine the manganese content for samples from above mentioned processes.

Equipment that will be utilised in and at the processing plant include:

- Crushers
- 1 x Genset (1000 Kva)(Standby)
- Various Conveyors
- Excavators
- Front end Loaders
- Water trucks for dust suppression

- Production Rates:

Wepex Trading(Pty) Ltd is on site and therfore production will continue with the current plant and equipment**.**

Expansions on the current infrastructure and plant will be undertaken in 2022 in order to ramp up production to produce approximately 500 000 tonnes per annum of marketable manganese.

All legal and other processes will be undertaken during 2020 and 2021 for obtaining the Mining Right including the technical sign-off on additional plant and mining infrastructure and equipment and based on the asumption that the Mining Right will be issued by the Department of Mineral Resources.
Wepex Trading is already on site and has been issued with an authorisation for bulk sampling on the property. Screening and crushing operations are therefore already taking place, not to the extent that the Mining Right will allow but the production build-up period is envisaged to be 6 – 8 months to full production.

The period applied for is 12 years, and is calculated at 11 years including 6-8 months for the production build-up period.

Current production and economic (low price and production) factors including recovering a sealable product from dumps through the application of technology may further increase the production period of the mine.

New Technology available to operators also increase the efficiency of the mining operations and even provides opportunity for reworking waste dumps and old "mined out" areas with remarkable results and profit margins.

The production rate is calculated on the assumption that the mine is fully operational for the entire year and does not consider weather patterns, mine

stoppages or labour unrest which may have considerable negative effects on production

A comprehensive fleet determination was done by Wepex Trading considering the material that need to be excavated, and hauled from the opencast mining operation.

Wepex determined the fleet based on a 1000 000 tonne per annum ROM with a stripping ratio of 1.9. Most of the Equipment will be secured through rental agreements with contractors. Wepex Trading has most of the agreements in place as bulk sampling activities will continue until the Mining Right is secured.

The plant will operate for 264 days per year for ~9 hours per day (Sundays, public holidays and days when rain prevent production have been taken in consideration).

The average plant production per day will thus be ~2,638 tonnes/day at an average of 293 tonnes/hour.

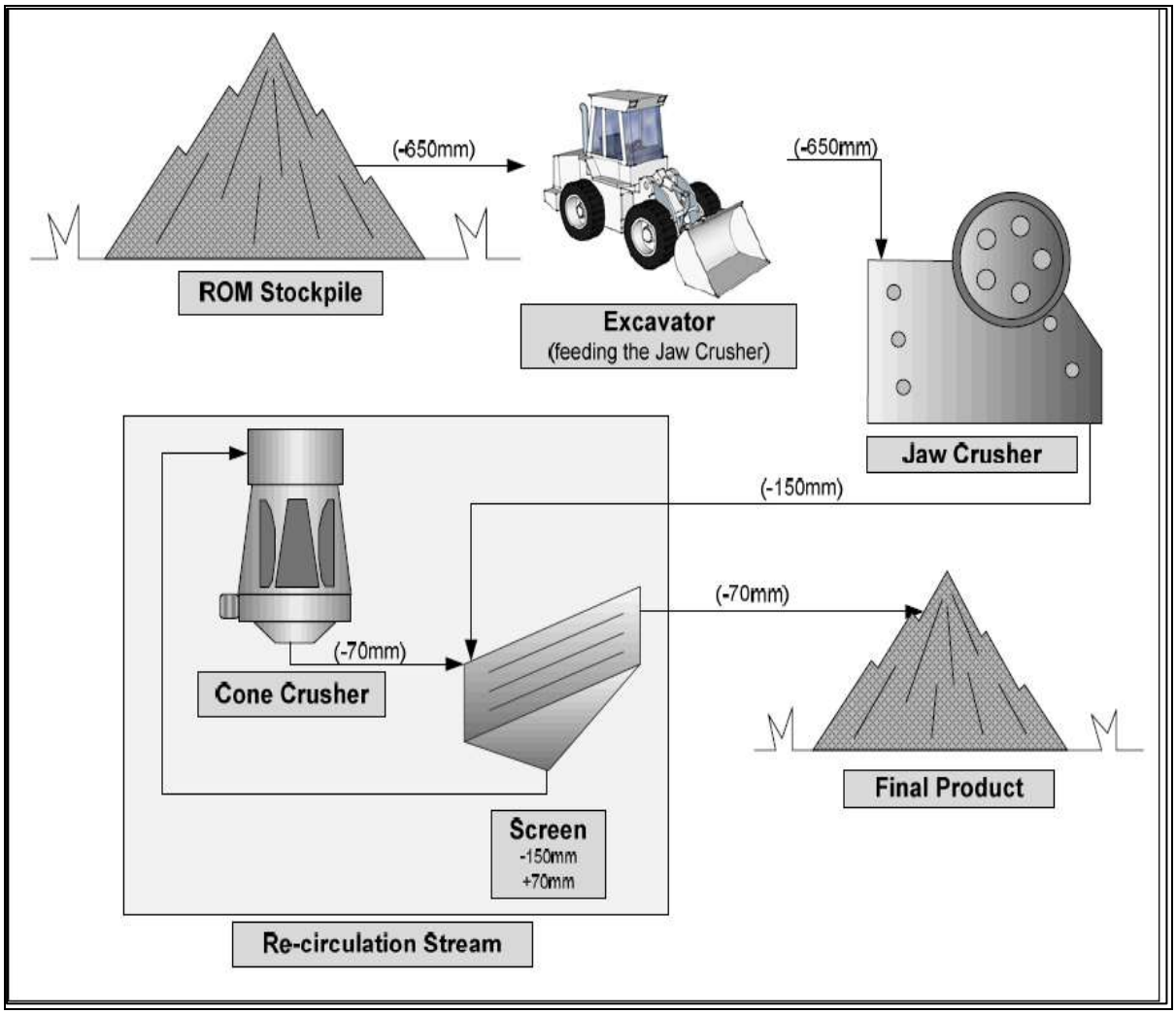

Figure 4. Conceptual schematic flow diagram of the plant.

e) **Policy and Legislative Context**

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.

Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.
Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Mining Right has been applied for (NC) 30/5/1/2/2/10186 MR. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption) - Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM: AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM: AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations.	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered.

	Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007 Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List of Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa's natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	-

National Environmental Management: Waste Management Act (Act 59 of 2008)	- Chapter 4: Waste management activities - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM: WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	- To be implemented upon the approval of the EMPR.
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary. - Control measures are to be implemented upon the approval of the EMPR.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit issued by the responsible heritage resources	- Control measures are to be implemented upon the approval of the EMPR. Fossil finds procedure are attached to the PIA.

	authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource; (i) altering the bed, banks, course or characteristics of a watercourse;	- A water use application must be submitted and will be submitted as soon as the EIA EMP had been finalized. - Control measures are to be implemented upon the approval of the EMPR.

	(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.	- Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees.	- Control measures are to be implemented upon the approval of the EMPR.

	- Section 9: General duties of employers and self-employed persons to persons other than their employees.	
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	- Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land	- To take note.
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like;	- To take note.

	- Agriculture, land survey S10	
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR

f) Need and desirability of the proposed activities:

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

A prospecting right has been issued in terms of Section 19 of the MPRDA with a prospecting right number of (NC) 11815 PR which was executed on behalf of the Minister of Mineral Resources on 3 July 2017 on the same property for Wepex. Wepex have also lodged a Mining Right application on the property.

The activity is based on manganese deposits of the Postmasburg Manganese Field which were discovered in 1922 and mined up to 1989. Numerous mining companies of which Associated Manganese Mines of South Africa Ltd (Assmang) and South African Manganese Ltd (Samancor) were the predominant role players in exploiting these deposits (see figure 5 below).

In Figure 5 the manganese ore zone as well as the Reivilo and Gamagara Formations are indicated.

The Gamagara sediments dipping 6° west cover the deposit and where the strip ratio exceeds the economical mining cost, exploitation of the deposit ceased. This deposit might extent westwards (Beukes, 1978), but due to the nature of the deposit no drilling was done to test the continuation. Post-depositional thrusting associated with the Keis Orogeny is visible north-west of Glosam where the Ongeluk Formation has been thrust on the Gamagara Formation.

Younger detrital manganese associated with the present day erosional surface accumulates along slopes and exposed karst topography. This is visible as scree and gravel on the floor of the mining operation.

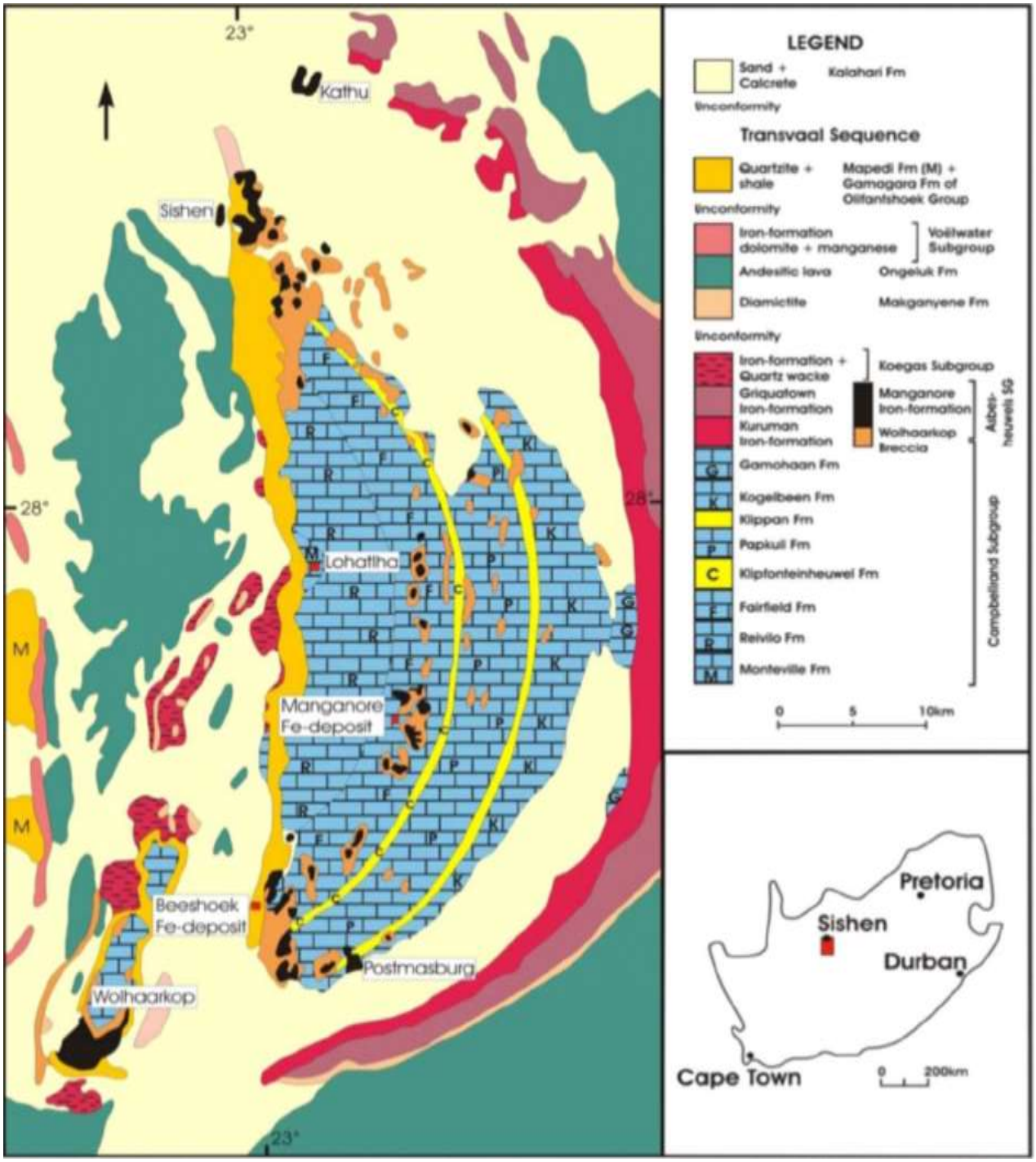

Figure 5. Geological Map of the area (Map out of the Prospecting Work Programme by Minrom).

- **Need:**

  Global manganese reserves averaged 680 million tons (Mt) in 2017, with South Africa leading at 29.4 percent, followed by Ukraine and Brazil at 20.6 percent and 17.6 percent, respectively. Global manganese ore production averaged 22.7 Mt, a 42.1 percent increase compared with 2016, with South Africa contributing 62.1 percent, followed by China and Australia at 15.6 percent and 9.7 percent respectively. The increase in global manganese ore production was due to an increase in South Africa's production by 3.1 percent from 13.4kt in 2016.

Table 2: World Manganese ore reserves, production and exports 2016-2017(Source: DMR Directorate Mineral Economics: 2017)

COUNTRY	RESERVES#			PRODUCTION*			EXPORTS#		
	MT	%	Rank	Mt	%	Rank	Mt	%	Rank
South Africa	200	29.4	1	14.1*	62.1	1	13.4	38.1	1
China	48	7.1	5	2.5	15.6	2	0.36	1.7	7
Australia	94	13.8	4	2.2	9.7	3	5.5	15.6	2
Gabon	20	2.9	7	1.6	7.0	4	4.3	12.2	3
India	34	5.1	6	0.79	3.5	6	1.1	3.1	5
Brazil	120	17.6	3	1.2	5.3	5	2.6	7.4	4
Ukraine	140	20.6	2	0.38	1.7	7	0.8	2.3	6
Other	24	3.5		0.76	3.3		7.1		
2017	680	100		22.7	100		35.2	100	
2016	690			16			21.6		

*Source: +USGS 2018 # CRU Group 2017 # Directorate Mineral Economics, DMR**

Source: DMR Directorate Mineral Economics: 2014

South Africa's manganese ore production increased by 2.9 percent to 14.1Mt in 2017 compared to 13.7 Mt in 2016 (Table 3). Export mass increased by 19.2 percent, due to demand for lower grade ore, especially from China. Mines such as Tshipi e Ntle, exported most of the lower grade manganese ore (35 percent and lower manganese ore content), which was previously considered as waste, and formed part of the mine's stockpiles, apart from their higher-grade ore export, thus increasing export mass. South Africa's manganese alloys are dominated by high carbon ferromanganese (HCFeMn), which accounts for about 57.5 percent of the total alloy production, followed by silico-manganese (SiMn) and medium carbon ferromanganese (MCFeMn), at about 34.9 percent and 12.9 percent respectively.

Table 3: South Africa's Manganese Ore Production and Sales 2008 to 2017 (Source: DMR Directorate Mineral Economics: 2017)

Year	Production	Local sales		Export sales	
		Mass	Value	Mass	Value
	Kt	Kt	R'000	kt	R'000
2008	6 807	*	1 761	4 689	15 581
2009	4 578	*	583	3 975	5 003
2010	7 171	*	1 320	5 986	9 340
2011	8 651	*	1 325	6 772	8 569
2012	8 943	*	1 134	7 497	9 685
2013	10 957	*	1 506	7 961	12 969
2014	14 051	*	1 644	9 644	14 734
2015	15 952	*	703	10 026	12 657
2016	13 735	*	827	11 245	18 861
2017	14 140	*	1 671	13 403	30 403

Source: DMR, Mineral Economics, 2017, (*) – withheld

Table 4: South Africa's Production and sales of other Manganese Alloys, 2008 – 2017 (Source: DMR Directorate Mineral Economics: 2017)

Year	Production	Local sales			Export sales		
	mass	Mass	Value	Unit Value	Mass	Value	Unit value
	Kt	kt	R'million	R/kt	kt	R'million	R/kt
2008	762	126	1 767	14 037	682	1 190	17 451
2009	404	68	597	8 839	413	3 624	8 772
2010	790	65	600	9 264	751	7 015	9 338
2011	1 064	54	482	8 927	854	7 407	8 673
2012	882	60	526	8 749	681	6 158	9 037
2013	787	82	737	8 955	577	4 927	8 539
2014	970	104	1 020	9 780	659	6 334	9 619
2015	614	34	365	10 557	496	4 756	9 572
2016	370	25	249	9597	341	3095	9056
2017	458	38	592	15464	271	4068	14968

Source: DMR Directorate, Mineral Economics, 2017

The world's output of manganese ore increased in 2018 for the second consecutive year, on rising demand from manganese alloy smelters. It reached 20.3 million dry mt (Mn contained), up by 6% or 1.2 million dry mt from 2017, exceeding 2014 production of 19.3 million mt and marking a new record high. The additional supply mostly came from Africa and Australia, driven by China, where output decreased because of mine depletion and stricter safety regulations.

- Industrial Application Manganese

Approximately 85 percent of the manganese units mined from the ground is used in the production of mild and carbon steels. The other, more minor, uses of manganese are in the manufacture of non-ferrous alloys, dry cell batteries, chemicals and agricultural products. Recently the use of manganese in steel making was extended into the production of speciality steels, valve and engineering steels and in the Series Stainless Steels, in which a combination of manganese and nitrogen replace nickel as the austenitizing agent. In its use in steelmaking, manganese is mainly used in the form of bulk alloys (High-Carbon Ferromanganese and Silico Manganese) or in speciality sheets as refined alloy (Medium-Carbon Ferromanganese or Low-Carbon Ferromanganese). Electrolytic Manganese Metal is used as an alloying agent in non-ferrous alloys or as a substitute for refined manganese alloys in the steel industry.

In its use in crude steel production, the manganese serves to de-sulphurise the molten steel as well as to control the shape of the residual sulphur inclusions in rolled steel products. In addition manganese is used as an alloying agent, which imparts toughness and hardness to the steel. The extreme example of the application of manganese in this respect is the ultra-hard Hadfield and Rail Steels, which contain 15% manganese.

- Global Steel Market

World crude steel production reached 1 691.2 million tons (Mt) for the year 2017, increasing by 4.0 percent compared to 2016. Crude steel production increased in all regions in 2017, except in the CIS, which remained stable. China's crude steel production in 2017 reached 831.7 Mt, up by 5.7 percent, compared with 2016, with the countries share in steel production increasing to 49.6 percent compared from 49.4 percent. The European Union, an economic and political block, which consists of 28

countries, Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom, (EU-28), produced 168.7 Mt of crude steel, an increase of 4.1 percent compared to the previous year.

There are in excess 700 Steel Producers world-wide producing a total of 1.69 billion tonnes of steel in total. Based on manganese pre-dominant use in steel making, manganese market trends closely follow that of the steel market. However, in the last fifteen years, the production of steel has grown by 1% to 1.5% while the growth in the use of manganese remained static as a result of increased efficiencies in the application of manganese in the steel making process. At present, further increases in the efficiency of manganese application are limited and thus the market for manganese should closely follow that of steel as there is no current or potential substitute for manganese in steelmaking.

In modern steel making practice approximately seven (7) kilograms of manganese alloys are added per tonne of crude steel produced. High rates of growth in China has resulted in a recent increase in the Global unit consumption of manganese to 10.4 kilograms per tonne steel.

The current market for manganese alloys (High-Carbon Ferromanganese, Silico manganese and Medium-Carbon Ferromanganese) is approximately 7.4 Mt of contained manganese per annum (10 Mt of alloy). The production of alloys follows demand fairly closely as stocking and de-stocking cycles as well as scrap returns do not have a major influence within the industry, although purchases from the National Defence Stockpile in the United States of America have an influence on the industry. Manganese ore and alloy production is dominated by the high grade manganese ore producers namely, BHP Billiton (Samancor), Eramet, CVRD and Assmang although the influence of the low grade ore producers, particularly in China, has grown in recent years.

The importance of the non-integrated alloy producers is also diminishing as the major producers increase their level of integration. The production volumes in the industry are summarised in Table 5.

Table 5: Production Summary of the Manganese Industry (Roskill Manganese 2003, International Manganese Institute, Market Research Report, Dec 2005)

Ore Grade	Company	Country	Annual Production Tonnes	
			Ore	Alloy
High	BHP Billiton	South Africa	2 500 000	545 000
		Australia	1 400 000	220 000
	Eramet	Gabon	3 700 000	

		Europe		725 000
		China		250 000
	CVRD	Brazil	2 700 000	243 000
		Europe		185 000
	Assmang	South Africa	2 000 000	227 000
	CML	Australia	1 000 000	
Low	Various	China	9 600 000	4 510 000
	Various	India	2 000 000	756 000
	Various	Ukraine	800 000	336 000
	GML	Ghana	1 500 000	
	Other	Various	6 570 000	
No Ore	Various	Japan		524 000
	Nikopol	Ukraine		970 000
	Other	Various		1 109 000
Total			**32 770 000**	**10 600 000**

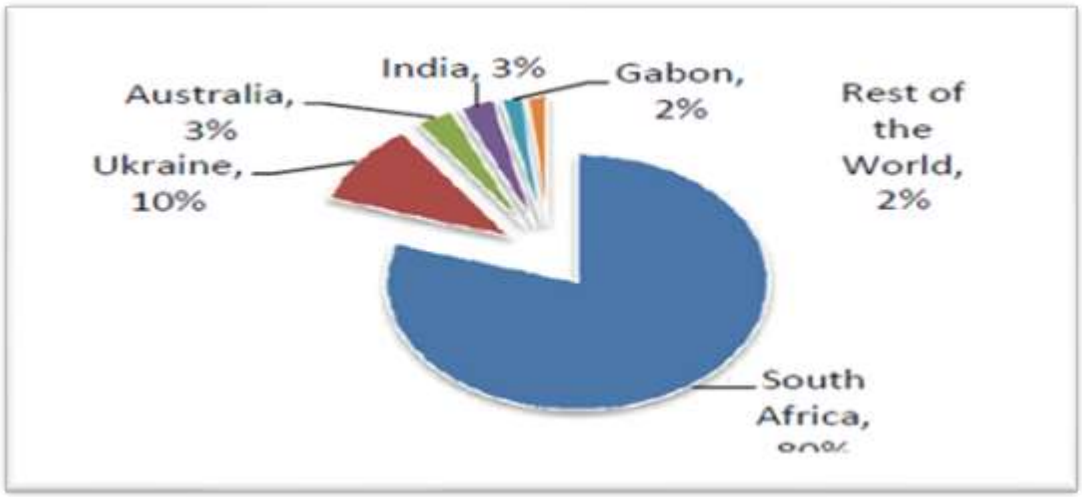

Figure 6: Global Manganese reserves in 2009

- Desireability

The manganese value chain consists of three segments namely:

- Ore Producers
- Alloy Producers
- Steel Producers

The ore industry is segmented by ore characteristics and comprises of:

- High grade ore (Typically ore with more than 35% manganese content – producers account for two thirds of production)
- Low grade ore (Contributing to a third of production)

The end use customers are primarily steel producers (94%) of demand. Chemical and specialist metallurgical segments contribute the balance of the demand.

The chemical market demand is for the following:-

- Dry Cell Manufacture
- Glass Industry
- Pigments and Dyeing Material
- Paint and Varnish Driers
- Fertiliser
- Uranium Industry

The chemical market is a very small proportion of ore used and as the ore produced at Wepex Trading is not intended for this market the main focus will be placed on the Metallurgical Market. Both iron and manganese are used to manufacture steel, ferrous and non-ferrous alloys and pig iron. At least 95% of all ore mined are used in these processes.

The main buyers of raw iron and manganese ore are India and China, with South Africa having a small local market that is already oversupplied.

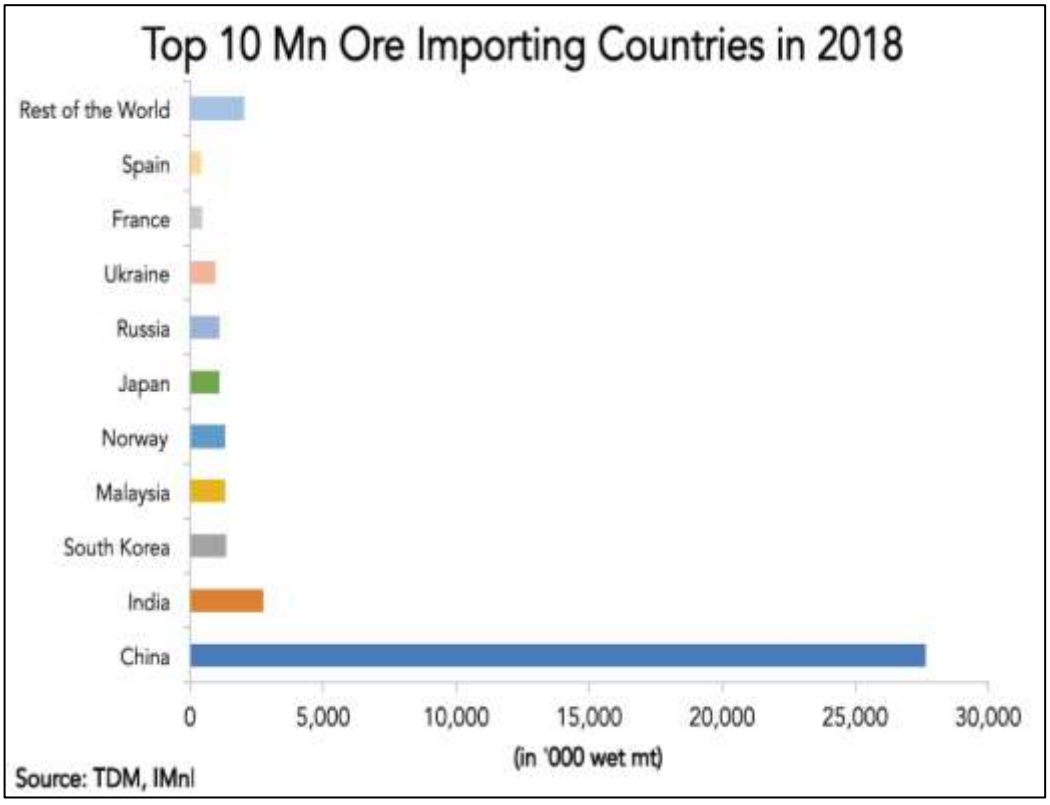

Figure 7. Top ten Ore importing Countries in 2018

g) Period for which the environmental authorisation is required:

The Mining Right application was made for 12 years.

h) Description of the process followed to reach the proposed preferred site:

(NB!! – This section is not about the impact assessment itself; it is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issued raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.)

(i) Details of all alternatives considered:

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

(a) The property on which or location where it is proposed to undertake the activity:

The registered description of the land to which the mining right application relates:

Farm Name	Title Deed	In Extent
Remaining Extent of the Farm Gloucester 674, located in the Kuruman District, Northern Cape Province	T654/1966	1165.8 Ha

The property on which the Mining Right was applied for is determined by the geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.

The area has been extensively mined in the past, more recently by Assmang (manganese ore). Large scale mining in the past has disturbed the area extensively, with open pits, access roads and mining infrastructure found throughout the application area.

The property is accessible via decent roads from different directions.

Infrastructure in the Tsantsabane area is well developed with good road and rail networks, electricity grid and water. Experienced labour is available in the area as is an extensive network of secondary industries geared towards small and large-scale operations. ESKOM grid power is available on site. There is also a well-established rail network which is operated by Transnet. Road transport service providers are well esthablished.

Wepex Trading (Pty) Ltd secured water from the Sedibeng Water pipeline for use on the mine. The surrounding areas rely on groundwater for both domestic and livestock watering purpose.

Alternatives considered:-

Alternatives for land are thus not available, as the mining right was applied for over this area with proven reserves which had been prospected by Wepex.

(b) The type of activity to be undertaken:

Opencast Mining activities for Manganese and Iron Ore.

Alternatives considered:-

The only alternative land use is livestock and game farming; however the applicant's main economic activity is mining and for this reason does not favour any other alternative land use.

(c) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating mining project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the access roads, proximity to the areas earmarked for mining as well as limited additional impact on the environmental (non-perrennial drainage lines and wind direction), heritage resources and discussions with the surface owner.

The following infrastructure will be established and will be associated with the mining operation :

- Explosive Magazine (if required):
  If required the mine will need two magazines to store the different explosive products namely:
  - 200 case detonator and accessories magazine (3 meter x 6 meter)
  - 200 case explosives magazine (3 meter x 6 meter)

  The magazine area will be fenced to comply with the guidelines set out by the Chief inspector of Explosives (CIE). The fence must be further than 10 meter away from the magazine.

  The CIE determines the safety radius necessary, but the typical approved radiuses have been 90 meter for the inner radius & 180 for the outer radius.

  No structures are allowed in the area contained by the inner radius and only structures approved by the CIE, for example a guard house, will be allowed in the area contained in by the outer radius.

  The construction of the magazines and the safety and security measures for the magazines and the magazine area are regulated by the Explosives Act.

- Ablution blocks (Sewage facilities)

- Clean & Dirty water system:
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.

- Fuel Storage facility (Diesel tanks): 10m²

It is anticipated that the operation will utilize 4 x 17 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.

- Re-fuel and lube station .

- Mining Area : 350 Ha
  If required, the mining process will be initiated by drilling of blast holes and then blasting said holes. The ore will be loaded from the open pit and hauled to the crushing and screening plant.

- Generator (if required): 28m²
  The mine infrastructure plan made provision for a brick building that will house the generators (8 x 30-100KW) for power generation on site.

- Office and Office Parking Bay: 1.547 Ha
  It is anticipated that vegetation will be cleared in this area and superfine material will be used as groundcover in the parking area.

- Crushing and Screening Processing plant: 300m²
  The processing of ore will be a dry process, with the option to convert to a 'wet' process after full production has been reached. Crushing and screening will be done by mobile plants without the construction of any permanent buildings. After full production a semi-permanent separation plant and semi-permanent crushing plant will be constructed

- Roads (both access and haulage road on the mine site): 16 Ha
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the mining operation will create an additional 7-8 km of roads, with a width of 20 meters. The width of the road is based on an operating width of the ROM haul trucks of 5 meters. Best practice and the guideline from the DMR is to allow for 4 x Operating width of haul truck, in this case 20 meters wide roads. An existing service road providing access to the north and the south of the farm will be upgraded to DMR regulations and be used as the main service road. The current access road next to the railway line is deemed adequate for a service road into the mine.

    - Salvage yard (Storage and laydown area): 2Ha
    - Security Gate and guard house at access control point 675m².
    - Product Stockpile area: 5 Ha
    - Ore Stockpile dumps.
    - Subgrade stockpile area : 7.5 Ha
    - Topsoil storage area (temporary): Topsoil dumps X3: 1.5 Ha

- Waste disposal site (domestic and industrial waste): 140m²
  It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:
  - Small amounts of low level hazardous waste in suitable receptacles;
  - Domestic waste;
  - Industrial waste.

- Workshop and Wash bay :245m²

- Water distribution Pipeline.

- Water tank :
  It is anticipated that the operation will establish a minimum of 8 x 10 000 litre water tanks with purifiers for potable water.

- Weighbridge: 600m²

- Weighbridge control room: – Two offices :(360 m²).

Alternatives considered:-

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential, because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are viable option for infield screening activities, but the best viable long term option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to site operations.

Wepex Trading (Pty) Ltd secured water from the Sedibeng Water pipeline for use on the mine. The surrounding areas rely on groundwater for both domestic and livestock watering purpose.

Therefore, a pipeline route will be designed based on the principle of minimum impacts to the environment. Alternatives in terms of altering the characteristics of drainage lines include avoidance and demarcation as no-go zones.

In terms of power generation the options available was for ESKOM power or generators. Wepex Trading (Pty) Ltd will only utilise diesel generators as a backup electricity supply during times of electricity interruption.

In terms of sewage the decision was made to use ablution blocks facilities with closed French drains.

(d) The technology to be used in the activity:

- Technique

During the mining process overburden (waste material) will be removed from the manganese ore. The manganese ore will be mined selectively to ensure that only on grade material is transported to the Run of Mine (ROM) stockpile at the plant. The mining equipment selected for the mine will enable the mine to carry out the selective mining process. The selective mining process will be controlled by the mine's geologists. From the mine the manganese ore will be transported to the plant. The plant process is a standard crushing and screening process to create a marketable product with a particle sizing of -100mm +8mm.

- Technology

The technology applied will be a jaw crusher, a cone crusher and a multi-deck screen. The final product will have a particle sizing of -100mm to + 8mm and a manganese content of +28% Mn (Manganese) average. A independent laboratory will visit the site daily basis.

Alternatives considered:-

The planned mining activities, include the excavation of a pit with continued backfilling if possible. The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the manganese fraternity. There is no other feasible, alternative mining method for the mining and extraction of manganese.

(e) The operational aspects of the activity:

The ore is mined by means of conventional opencast techniques (drilling-blasting-load-haul) and requires heavy earth-moving equipment. Vegetated soil is stripped; whereafter, if required, drill rigs are used to drill and blast overburden and ore separately. Bench blocks are drilled using drill rigs to produce blast holes, which are then charged with emulsion explosives. The Run of Mine (ROM) will be crushed and screened by using the crushing and screening plant.The blasted rock is loaded with excavators into articulated dump trucks and the ore is hauled to the crusher and ore stockpiles. The expected lifespan of the mine is 11 years.

Mining activities will primarily make use of existing roads created by previous mining activities, but additional roads will most likely be created. A crushing and screening plant will also be erected on site.

Alternatives considered:-

The conventional opencast drill-blast-load-haul-mining method has been proven to be the most economic viable method currently being used by the manganese fraternity. There is no other feasible, alternative mining method for the mining and extraction of manganese.

(f) The option of not implementing the activity:

Potential land use includes grazing and mining. The majority of the area is classified to have low to moderate potential for grazing land and not suitable for crop yield. Apart from the manganese deposits, there are also potential for iron ore mining on the property. Therefore, mining activities are believed to be the most economically beneficial option for the area. Whether the iron ore mining operation continues or not, the other mining operations already granted will most likely persist. The farming of livestock will only be able to continue in areas not affected by mining operations. The most significant impacts associated with grazing activities include the provision of water. These are not expected to have a serious impact on the existing groundwater features. Cumulative impacts associated to grazing include overgrazing and destruction of natural vegetation, but the cumulative effect of mining activities on the property are expected to outweigh any potential negative effects that agriculture might have.

The Wepex Trading Mining project aims to uplift the local community. If the operation does not continue it would hold back any potential employment for the region and the families who are likely to benefit from the positive employment opportunities. Simultaneously, it may have a stagnant effect on the economy of South Africa and the manganese industry as a whole. Substantial tax benefits to the State and Local Government will also be inhibited.

Mining forms an integrated part of the social and economical growth of South Africa and more specifically the Northern Cape Province.

(ii) Details of the Public Participation Process Followed:

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

Identified interested and/or affected parties were notified of the application as follows:

- Notification letters were sent to all identified interested and / or affected parties on the 26 of November 2020. Attached to each of these letters was a Background Information Document, containing information relating to the proposed mining project application and the Environmental Authorisation.
- A newspaper advert was placed in the Kathu Gazette on 06 March 2021 which are the local newspaper in the project area.
- Notices was placed at the Municipal Offices Postmasburg, South African Police Services Offices, Magistrates Court Postmasburg.

Proof of notification is attached as Appendix '3'.
If necessary and requested a public meeting will be advertised and held after all specialist reports have been received and after the first draft Environmental Impact Assessment have been compiled in terms of the Mineral and Petroleum Resources Development Act, 28 of 2002 and the process to be followed.

(iii) Summary of issues raised by I&AP's

(Complete the table summarising comments and issues raised, and reaction to those responses.)

Interested and Affected Parties List the names of persons consulted in this column, and 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 the issues and or response were incorporated
AFFECTED PARTIES					
Landowner/s	**X**				
Wepex Trading Pty Ltd	X				
Lawful occupier/s of the land					
Arengo 352 Pty Ltd PO Box 978 Bloemfontein 9300 21 Gerrit Schouten Street Kimberley 8300 22 Gerrit Schouten Street Kimberley 8301	X Registered Letter with the BID were sent on 26 November 2020	21 January 2021 29 January 2021 29 January 2021	Registered letter returned by Post Office as unclaimed Registered letter returned by Post Office as unclaimed Registered letter returned by Post Office as unclaimed		
Landowners or lawful occupiers on adjacent properties	**X**				
Mr A.C. & Mrs E.C. Claassens P.O. Box 735 Postmasburg 8420	X Registered Letter with the BID were sent on 26 November 2020				
Maremane Communal Property Association 162 George Street Kimberley 8301	X Registered Letter with the BID were sent on 26 November 2020	.			
Municipal Councillor	**X**				
Municipality	**X**				

Municipal Manager and Mayor Tsantsabane Municipality P.O. Box 5 Postmasburg 8420	X Registered Letter with the BID were sent on 26 November 2020				
ZF Mgcawu District Municipality Private Bag X 6039 Upington 8800	X Registered Letter with the BID were sent on 26 November 2020				
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
ESKOM Holdings SOC Ltd, NC Operating Unit Land Development P O Box 606 Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020				
Eskom Environmental Division PO Box 356 Bloemfontein 9300	X Registered Letter with the BID were sent on 26 November 2020	21 January 2021	Registered letter returned by Post Office as unclaimed		
SANRAL P.O. Box 415 Pretoria 0001	X Registered Letter with the BID were sent on 26 November 2020				
Transnet P.O Box 72501 Parkview 2122	X Registered Letter with the BID were sent on 26 November 2020				
Dept. of Agriculture, Land Reform & Rural Development	X	19 January 2021	Registered letter returned by Post Office as unclaimed		

Private Bag X5018 Kimberley 8300	Registered Letter with the BID were sent on 26 November 2020				
Department of Rural Development and Land Reform PO Box 5026 Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020				
Department of Cooperative Governance, Human Settlements and Traditional Affairs HOD Private Bag X5005 Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020				
Dept. of Agriculture, Forestry & Fisheries Directorate: Forestry Management P.O. Box 2782 Upington	X Registered Letter with the BID were sent on 26 November 2020				
Department of Environment & Nature Conservation HOD Private Bag X6102 Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020	19 January 2021	Registered letter returned by Post Office as unclaimed		
Department of Water & Sanitation Private Bag X6101 Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020				
National Department of Public Works PO Box 224 Olifantshoek 8450	X Registered Letter with the BID were sent on 26 November 2020.	14 January 2021	Registered letter returned by Post Office as unclaimed		

SAHRA P.O. Box 4637 Cape Town 8000	X Registered Letter with the BID were sent on 26 November 2020				
Northern Cape Department of Roads and Public Works HOD PO Box 3132 Squirehill Park Kimberley 8300	X Registered Letter with the BID were sent on 26 November 2020				
Communities					
Maremane Communal Property Association 162 George Street Kimberley 8301	X Registered Letter with the BID were sent on 26 November 2020	19 January 2021	Registered letter returned by Post Office as unclaimed		
Traditional Leaders					
No Traditional Leaders					
Other Competent Authorities affected					
Albertus Viljoen CEO-Tshiping WUA info@tshiping.co.za PO Box 434 Postmasburg 8420	Registered as an interested and affected party via e-mail after noticing the process.	9 March 2021	Good Morning Mr. Oosthuizen I have noted the proposed public participation process and hereby register as a I and Affected party. Best regards Albertus Viljoen CEO Tshiping WUA	Thank you for your e-mail we will keep you informed of the process	
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					
Tshenolo Marotobolo thesurvivorsbusiness@gmail.com	Registered as an interested and affected party via e-mail after	23 March 2021	Afternoon Mr Oosthuizen This email serves as an official objection of your application for Mining Right. The reason for objection is that Glosam Mine as the mining contractor takes all business opportunities and	25 March 2021 Dear Mr. Marotobolo Thank you for registering as an interested party.	

	noticing the process.		distribute to the internal employees and Senior Managers for example we approached Mr Hugo for Wash bay. He took our proposal and gave her to her daughter in law. Thanks Tseno 0782293394	Would you please be so kind as to fill in the registration form attached and declare your interest - business, financial or other interest w.r.t application. Regards Roelien Oosthuizen (for Willie Oosthuizen 087 527 0713))	

* Note: The contents of this table have been recorded up to 25 March 2021 as the process of public participation is an ongoing process.

(iv) The Environmental attributes associated with the sites:

(1) Baseline Environment:

(a) Type of environment affected by the proposed activity:
(its current geographical, physical, biological, socio-economic and cultural character.)

- ***GEOLOGY:***

The Bishop Glouchester iron-ore and manganese deposits are symmetrically situated on the Maremane Dome. The dome is defined by carbonate rocks of the Campbellrand Subgroup and the iron formation of the Asbesheuwels Subgroup of the Transvaal Sequence, dipping gently at less than 10 degrees in an arc to the north and south. Only the eastern half of the dome is exposed. To the west, the Transvaal strata is overlain along and angular unconformity by red beds, conglomerate, shale and quartzite of the Gamagara Formation of the Olifantshoek Group. Further to the west, some Koegas iron formation, Makganyene Diamictite and Ongeluk Lava of the Transvaal Sequence are thrust over the Gamagara Formation along a north-south striking, westerly dipping low-angle thrust fault. The Gamagara Formation also strikes north-south and dips to the west. A unit of ferruginous chert breccias (Wolhaarkop Breccia) grading upwards into a distorted iron formation (Manganore Iron Formation) is wedged unconformably between the Gamagara Formation and the Campbellrand carbonate sequence along the northern and southern extremities of the Maremane Dome.

The Bishop Gloucester iron-ore and manganese deposits are situated along the contact between the Gamagara Formation and the underlying Manganore Iron Formations in the southern part of the dome. In general two ore types are present, namely laminated hematite ore, forming part of the Manganore Iron Formation, which is more restricted than that of the Wolhaarkop Breccia and is only preserved in pockets above the latter, below the Gamagara unconformity. The basal Doornfontein Conglomerate Member of the Gamagara appears to the best development above the Manganore Iron Formation along the east-central perimeter of the Maramane Dome and pinches out towards the centre of the dome. During the Carboniferous Period the Dwyka glacial event (Karoo Sequence) eroded portions of older sequences. A cover of tertiary soil, rubble and calcrete (Kalahari Formation) masks parts of the detail of the geology, with the result that geological modelling is almost exclusively based on exploration boreholes.

The erosion of the southern Bishop Gloucester deposit is fairly high. The result is that the Bishop Gloucester deposits are not uniform and

preserved pods of ore are found below the overburden and post-Manganore sediments.

The manganese ore deposit of Glosam is extremely irregular and has been deposited on the karstic Landscape of the Reivilo Formation of the Cambpellrand Subgroup. Further development of karst caused slumping of the deposit. This landscape might have formed during periods of chemical erosion (Grobbelaar and Beukes, 1986).

The bixbyite ore occur as lenticular and irregular-shaped ore zones along the base of the Sishen Shale within large solution cavities. This iron-rich manganese ore was deposited as a wad trapped is in karst hollows near surface together with exogenic detrital material (Gutzmer and Beukes, 1995). The proto-ore changed to crystalline bixbyite through lithification and recrystallization. The coarse crystallinity, open textures and veining of the deposit were caused by further fluid induced remobilization and recrystallization (Gutzmer and Beukes, 1995). This supergene alteration could have taken place during the deposition of the remainder of the Olifantshoek Group, but prior to the deposition of the Karroo Supergroup (Grobbelaar and Beukes, 1986). Younger Cenosoic erosion re-activated the karst surface introducing psilomelane crusts and pyrolusite nodules (De Villiers, 1960).

The Gamagara sediments dipping 6° west cover the deposit and where the strip ratio exceeds the economical mining cost, exploitation of the deposit ceased. This deposit might extend westwards (Beukes, 1978), but due to the nature of the deposit no drilling was done to test the continuation. Post-depositional thrusting associated with the Keis Orogeny is visible north-west of Glosam where the Ongeluk Formation has been thrust on the Gamagara Formation.

Younger detrital manganese ore associated with the present day erosional surface accumulates along slopes and exposed karst topography. This is visible as scree and gravel on the floor of the operation.

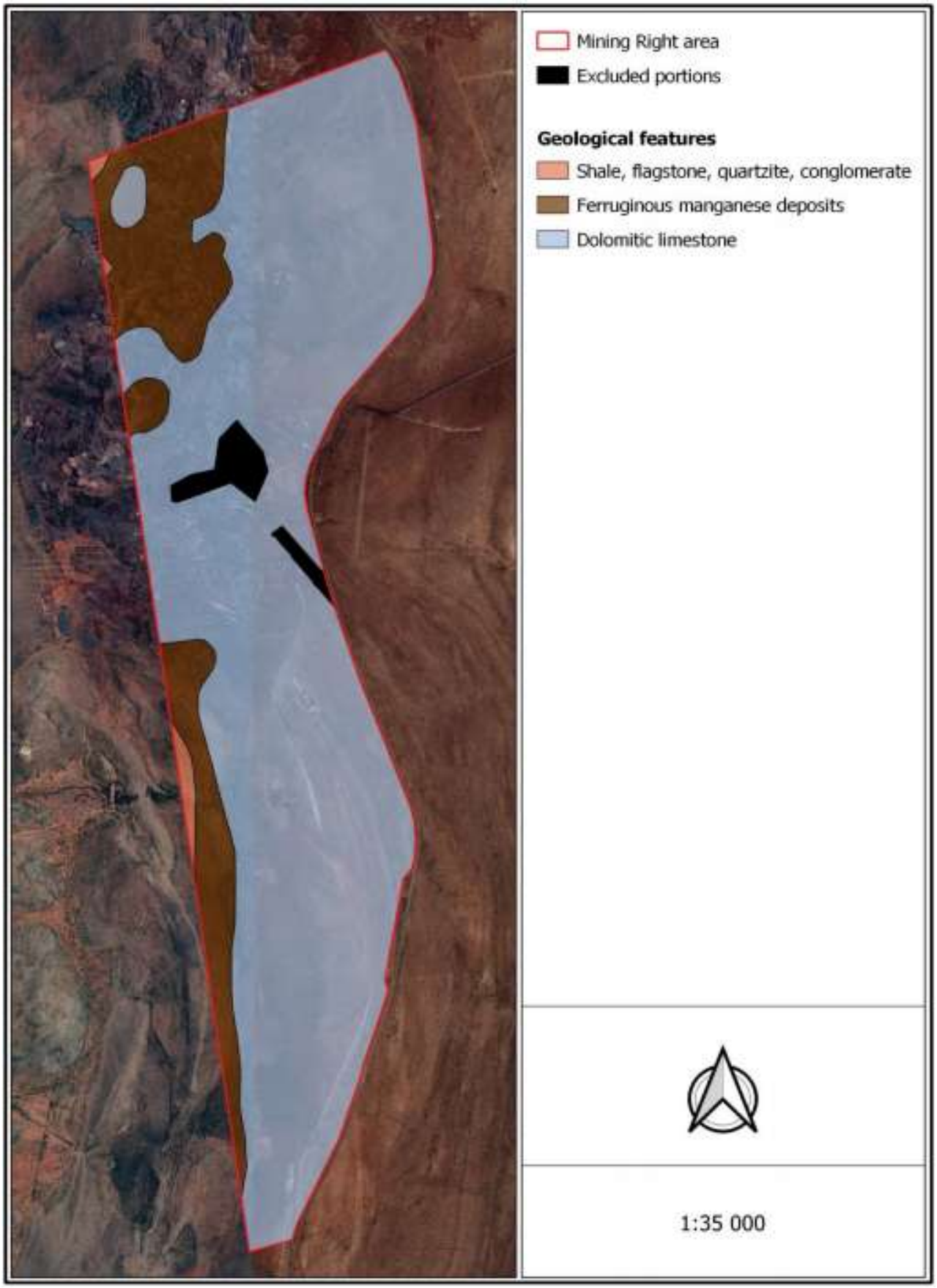

Figure 8. The distribution of geological features in the study area (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

- ***CLIMATE:***

Regional Climate

The climate of the Glosam area is described to be semi-arid with a mean annual precipitation of 349 mm. This tends to fall in summer and early autumn. Temperatures vary between -9°C and +42°C, with an average of 19.2°C.

Temperature

The average midday temperatures for Postmasburg range from 17°C in June to 32°C in January. The region is the coldest during July when the mercury drops to 0°C on average during the night.

Evaporation

The average annual evaporation rate in the region is 2 026mm a year, which is more than 5 times greater than the MAP (i.e. 349mm/year).

Rainfall

Rainfall records extending a period of 6 month for the Data for station [0321110 7] – Postmasburg show that the mean annual precipitation (MAP) is 349mm. The majority of rain falls in the later summer months of January, February and March, whilst the lowest rainfall records are recorded for the months of June, July and August. Rainfall tends to vary widely over the years as typical of most arid and semi-arid climates. The average annual evaporation rate in the region is 2 026mm a year, which is more than 5 times greater than the WAP (i.e. 349mm/year). Wepex operation is located in a low rainfall area. Most of the rainfall in this semi-arid region occurs in summer and early autumn during the months of November and April.

- **Topography and Soils :**

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Wepex Trading (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Topography and soil was described and included in this report as part of the ecological study.

The study area is predominantly underlain by the rocks of the Transvaal Supergroup, Griqualand West Sequence. Here, dolomitic limestone with subordinate coarsely crystalline dolomite of the

Ghaapplato formation from the Campbell group covers a large area in the eastern half of the study area (Figure 9). Shale, flagstone, quartzite and conglomerate from the Gamagara Formation of the Postmasburg group are found in west, while the iron and manganese deposits are associated with the unconformity between the latter formations.

The manganese ore deposit of Glosam is extremely irregular and has been deposited on a karstic landscape of the Cambellrand Subgroup, where the ferruginous manganese ore occur within large solution cavities. This was deposited as a wad trapped in karst hollows near the surface together with exogenic detrital material. Younger detrital manganese ore associated with the present day erosional surface accumulates along slopes and exposed karst topography. This is visible as scree and gravel on the floor of the historic mine pits.

Level plains with some relief (4), is the dominant terrain unit of the landscape in the eastern half of the mining area, which is closely associated with the Ag111 landtype (Figure 9 and Figure 10). The western half is however dominated by open hills and ridges, closely associated with the Ib238 landtype. These hills are rocky with minimal soil cover and the steep slopes produce high runoff erosion risks. On the plains, red-yellow apedal, freely drained soils with high base status are found. These soils have minimal development and are shallow (< 300 mm), occurring on hard or weathering rock. The rather flat terrain has low potential for runoff erosion. The sandy soils of the study area are prone to wind erosion. If badly eroded, the soils on Glosam have a very low potential to regenerate.

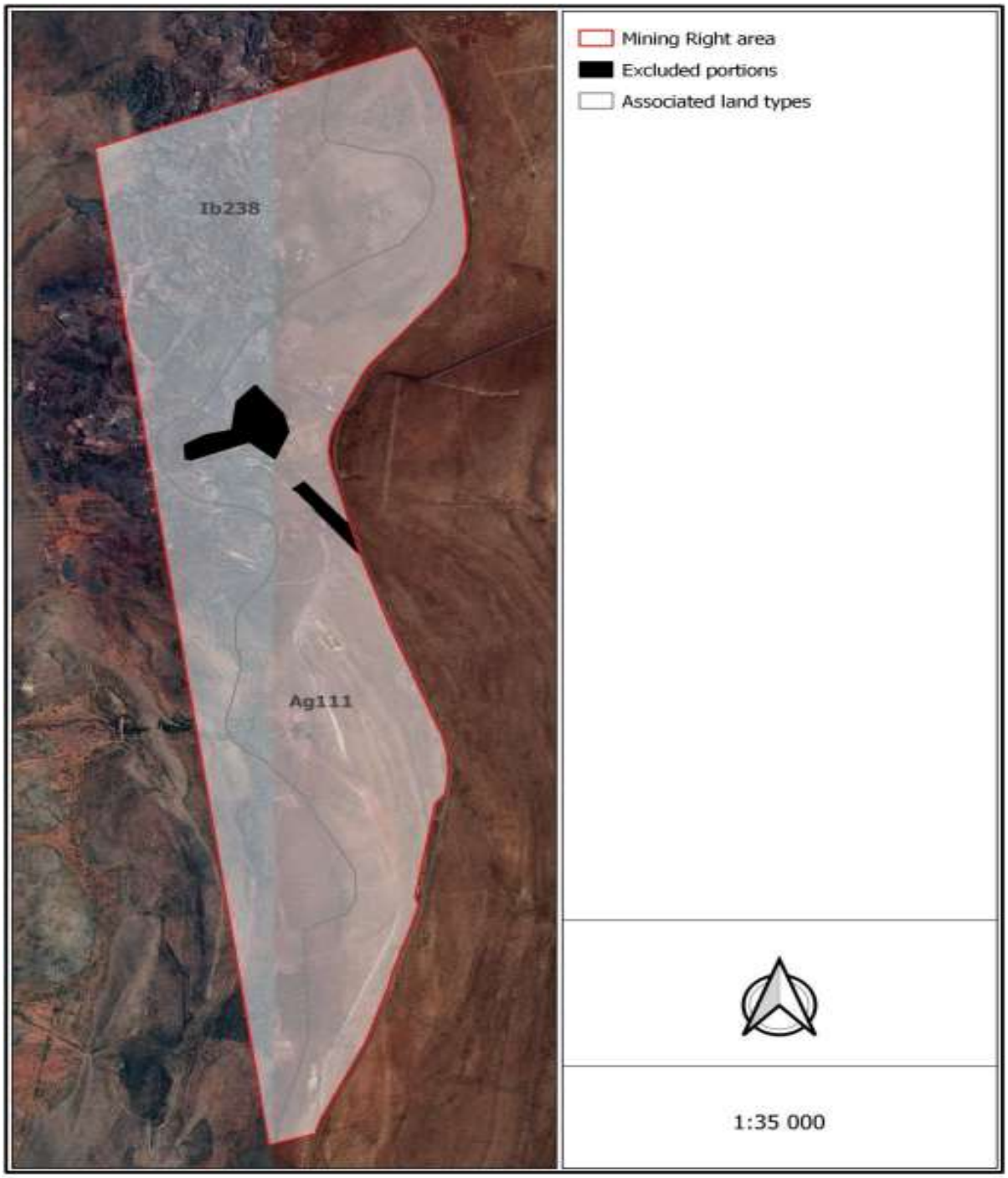

Figure 9. The dominant land types found in the study area (Map taken out of the ecological study of Boscia Ecological Consulting, January 2021).

Figure 10. Terrain from Sketch for the Ag111 land type of the study area. No terrain sketch is available for the Ib238 landtype. (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

- ***LAND CAPABILITY AND LAND USE:***

  Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Wepex Trading (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Land Capability and Land use was described and included in this report as part of the ecological study. (The study is attached as Appendix 4)

  The major land uses in the region are mining (manganese and iron ore) and agriculture. According to the Southern Africa Agricultural Geo-referenced Information System, the land capability of the plains in the east is non-arable with low potential grazing land, while the hills in the west are considered to be wilderness. The grazing capacity is between 18 and 30 ha/AU, with the agricultural region being demarcated for cattle farming. The property is categorised to have no suitability for crop yield.

  Glosam is characterised by a fairly complex mining history. Various formal and informal mining companies have mined the area for iron ore and manganese between the late 1920's and 1984. This produced numerous open pits scattered across the site. These pits and associated road networks are still visible today as well as various buildings and structures related to the past mining activities; some of which are of archaeological significance. Exploration activities have also been performed over the past decade.

  Current land use activities on the mining right area are indicated in Figure 11 and include existing infrastructure from the Wepex prospecting activities, two cell phone reception towers managed by MTN and Cell C, and a number of ESKOM power lines. Areas in the south of the mining right area are mainly used for grazing by livestock and wildlife and a Transnet railway track lines the eastern border of the mining right area. This railway line links the Kalahari mines with Port Elizabeth via Kimberley.

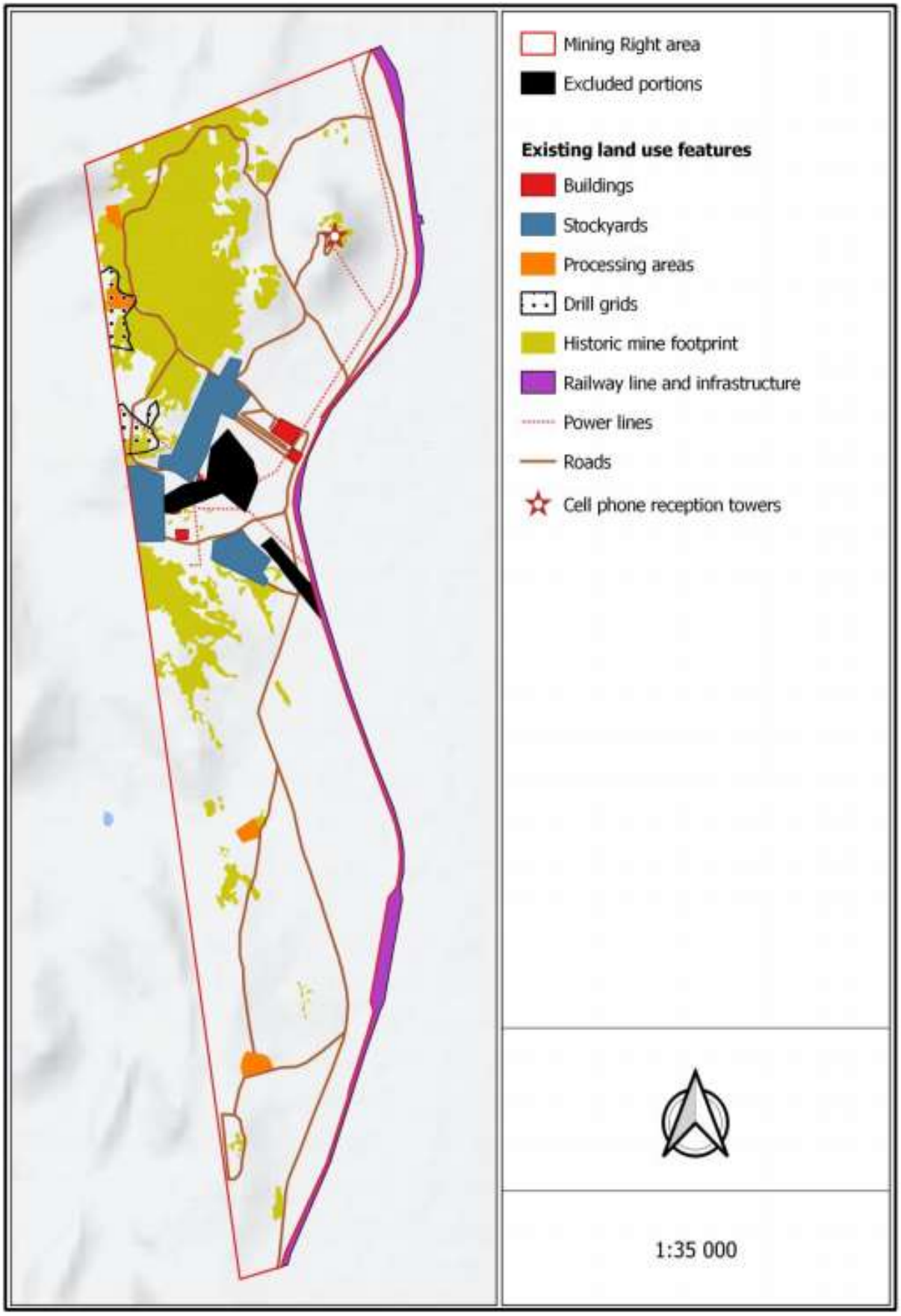

Figure 11. Current and Historic land use features of the area. (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

- ***NATURAL FAUNA:***

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Wepex Trading (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Natural Fuana was described and included in this report as part of the ecological study. (The study is attached as Appendix 4).

The Scope of Study

The specific terms of reference for the study include the following:

The study comprised a combination of field and desktop surveys for fauna and flora data collection in order to obtain the most comprehensive data set for the assessment. The fieldwork component for this report was conducted on 24 and 25 July 2016, but observations made during a site investigation on 23 February 2016 for a rehabilitation plan on a preceding project, is also included here. Most data for the desktop component was obtained from the quarter degree square that includes the study area (2823AA).

A desktop survey was undertaken to obtain lists of mammals, reptiles, amphibians and birds which are likely to occur in the study area. These were derived based on distribution records from the literature, including Friedmann and Daly (2004) and Stuart and Stuart (2015) for mammals, Alexander and Marais (2007) and Bates et al. (2014) for reptiles, Du Preez and Carruthers (2009) for amphibians and Taylor et al. (2015) for birds.

Additional information on faunal presence was extracted from the various databases hosted by the ADU web portal, http://adu.org.za, as well as from Robert's Multimedia Birds of Southern Africa (Gibbon 2006). A map of important bird areas (BirdLifeSA 2015) was also consulted. The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as a preliminary assessment of the availability and quality of suitable habitat at the site.

The likelihood of Red Data species occurring on site has been determined using the distribution maps in the Red Data reference books (Friedmann and Daly 2004; Bates et al. 2014; Taylor et al. 2015; ADU 2016) and comparing their habitat preferences with the habitat described from the field survey. The conservation status of

each species is also listed, based on the IUCN Red List Categories and Criteria (IUCN 2015) and/or the various red data books for the respective taxa.

Field survey

The faunal field survey was conducted concurrent with the vegetation survey. The habitats on site were assessed to compare with the habitat requirements of species determined during the literature survey.

The presence of faunal species was determined as follows:

- Identification by visual observation
- Identification of bird and mammal calls
- Identification of signs (spoor, faeces, burrows and nests)

This ecological assessment report attached as Annexure 4 describes the ecological characteristics of the proposed mining area, identifies the source of impacts from mining operation, and assesses the impacts, as well as the residual impacts after closure.

Sensitivity mapping and assessment

An ecological sensitivity map of the site was produced by integrating the information collected on site with the available ecological and biodiversity information available in the literature and various spatial databases. The sensitivity mapping entails delineating different habitat units identified on the satellite images and assigning likely sensitivity values to the units based on their ecological properties, conservation value and the potential presence of species of conservation concern, as well as their probability of being affected by proposed activities.

Assumptions and limitations

Due to the brief duration of the survey and the lack of seasonal coverage, the species list obtained during the site visit cannot be regarded as comprehensive. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant species present is captured. However, this is rarely possible due to time and cost constraints. The survey was nevertheless conducted in such a manner to ensure all representative communities are traversed and therefore is likely to have included the majority of the dominant and common species present.

The site visit for the study took place during winter, which is not an optimal time of the year. Most grasses and annuals present were not flowering, and was therefore not in a favourable state for the

assessment at the time of the site visit. The best time to evaluate vegetation in the study area is after at least some summer or late-summer rain when the vegetation has had a chance to respond and is in an actively growing state. The urgency of the survey for this project dictated that it should be done by July 2017. The results presented here can therefore only reflect the condition of the vegetation. Consequently, the timing of the site visit is considered to be a limiting factor which might compromise the results, as it is likely that there are species of conservation concern that were not visible at the time of sampling.

Faunal communities

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by means of hunt, kill, poison, capture, disturb, or injure any protected or specially protected animals. Furthermore, Section 12(1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner.

A number of the listed species are expected to occur on site either as residents or by occassionally passing over the area. None were however observed during the site visit. In general, bird species of the study area are likely to experience very limited disturbances in the form of noise and movement and small-scale local habitat loss as a result of the proposed mining activities. This will especially impact those birds that rely on the affected habitats for breeding, nesting and foraging. The disturbances will be confined to the drilling grids and habitat loss is associated with the construction of drill pads. Birds are however highly mobile and are expected to move to similar adjacent habitats, if necessary.

Apart from general disturbances and limited habitat loss, other potential impacts would come from the additional or intentional killing of birds. Species that are likely to get killed intentionally include vultures and owls, which often fall victim to religious beliefs or the medicinal trade. Monitoring and environmental inductions during the operation would be vital in order to ensure no or low impact.

- ***NATURAL VEGETATION:***

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Wepex Trading (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the

proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Natural Fuana was described and included in this report as part of the ecological study. (The complete study is appended as Appendix 4 to the Document).

The Scope of Study

The specific terms of reference for the study include the following:

Conduct a desktop study and field investigation in order to identify and describe different habitats and associated species of conservation concern within the environment that may be affected by the proposed activity;
identify the relative ecological sensitivity of the project area;
produce an assessment report that:

- indicates identified habitats and fauna and flora species and their ecological sensitivity,
- determines the potential impacts of the project on biodiversity,
- provides mitigation measures and recommendations to limit project impacts.

This ecological assessment report attached as **Appendix 4** describes the ecological characteristics of the proposed mining area, identifies the source of impacts from mining operation, and assesses the impacts, as well as the residual impacts after closure.

Data collection

The study comprised a combination of field and desktop surveys for data collection on fauna and flora in order to obtain the most comprehensive data set for the assessment. The fieldwork component was conducted on 17 June 2017 and most data for the desktop component was obtained from the quarter degree square that include the study area (2824AD).

Field survey

For the field work component, satellite images were used to identify homogenous vegetation units within the proposed mining area. Representative sampling plots were allocated in these units and sampled with the aid of a GPS in order to characterise the species composition.
The following quantitative data was collected:

- Species composition
- Species percentage cover

- Amount of bare soil and rock cover
- Presence of biotic and anthropogenic disturbances

Additional checklists of plant species were compiled during the surveys by traversing a linear route and recording species as they were encountered in each unit.

Broadscale vegetation patterns

The study area falls within the Savanna Biome (Mucina and Rutherford 2006), and according to the vegetation map of Mucina et al. (2005) two vegetation units are present on site, i.e. Kuruman Mountain Bushveld and Postmasburg Thornveld. This map has however not been mapped at a very fine scale and therefore does not reflect the true character of the site.

Kuruman Thornveld is distributed in the North-West and Northern Cape Provinces, and lies at altitudes between 1 300 and 1 500 m. This unit is distributed East of Kuruman to Lykso, and south of Bendell towards Good Hope. The unit is presented as flat rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting *Vachellia erioloba.* This unit mainly consists of Superficial Kalahari Group sediments, with deep red wind-blown sand, but Campbell Group dolomite and chert also occur. The dominant land types are Ae, Ai, Ag and Ah. The unit is not currently conserved within any formal conservation areas and is classified as being least threatened with a very low erosion and 2% transformation. The herb *Gnaphalium englerianum* is the only endemic plant species known to occur in this unit.

Kuruman Mountain Bushveld is distributed in the Northern Cape and North-West Provinces at altitudes between 1 100 and 1 800 m. It stretches from the Asbestos Mountains southwest and northwest of Griekwastad, along the Kuruman Hills north of Danielskuil, passing west of Kuruman and re-emerging as isolated hills. The unit is typically presented as rolling hills with gentle to moderate slopes and hill pediment areas with an open shrubveld. Here, *Calobota cuspidosa* is conspicuous within a well-developed grass layer. The Hills consist of banded iron formation, with jasper, chert and riebeckite-asbestos of the Asbestos Hills Subgroup of the Griqualand West Supergroup. Soils are shallow, sandy and of the Hutton form. The most common land types are Ib, followed by Ae, Ic and Ag. The unit is considered to be least threatened and very little is transformed and with little erosion being present. The unit

is considered to be least threatened and very little is transformed and with little erosion being present. It is not currently conserved within any formal conservation areas and the succulent *Euphorbia planiceps* is the only endemic species known from this unit.

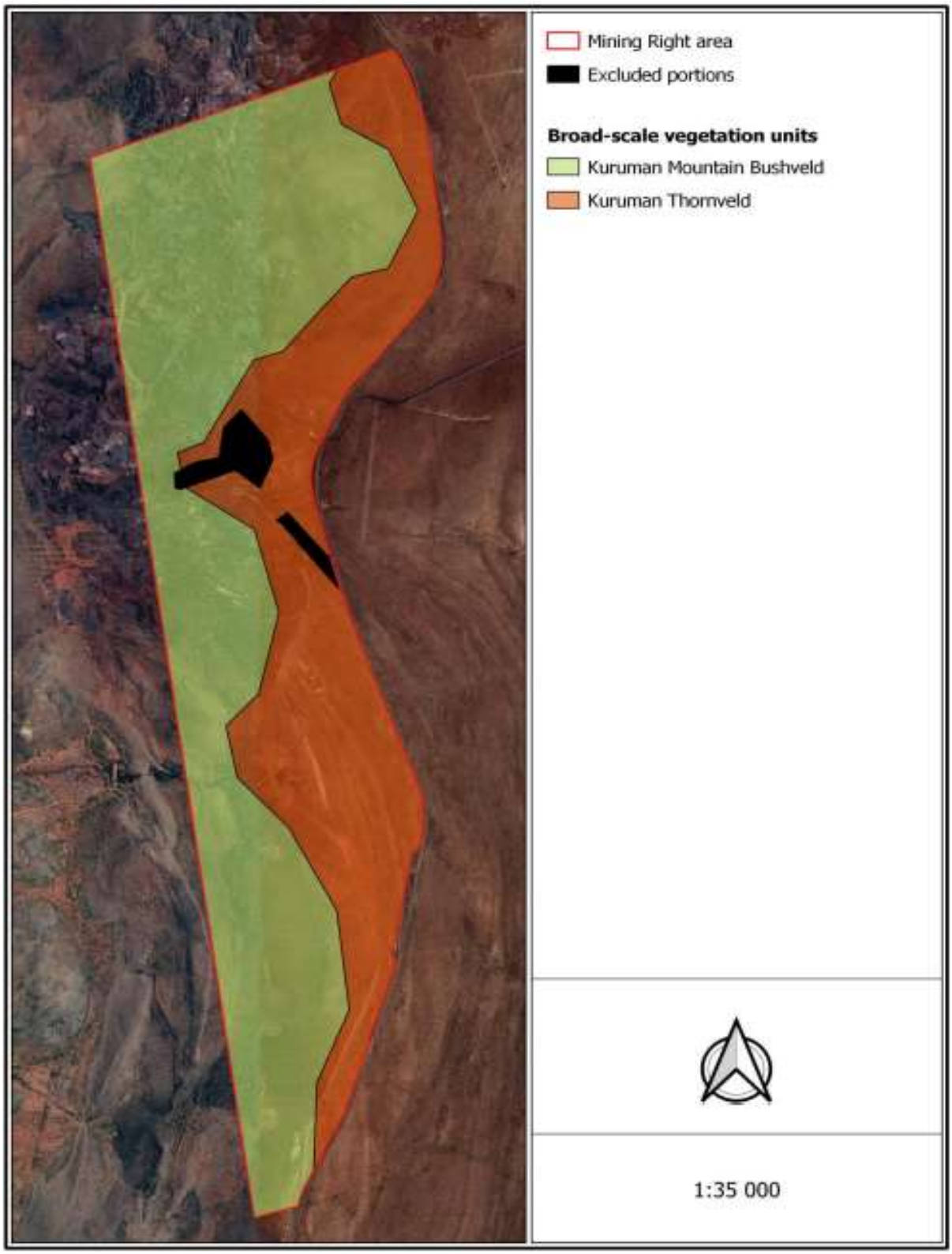

Figure 12. The distribution of broad-scale vegetation units in the study area.

- ***SURFACE WATER***

Dr. Betsie Milne from Boscia Ecological Consultants has been appointed by Wepex Trading (Pty) Ltd to provide an ecological study in order to highlight the ecological characteristics of the proposed mining area and to determine the possible impact of mining on the diversity and ecological status of the application area. Natural Fuana was described and included in this report as part of the ecological study. (The study is attached as Appendix 4).

Glosam falls within the Molopo D41J quaternary catchment of the Lower Vaal Water Management Area, as well as in the Neusberg D73A quaternary catchment of the Lower Orange Water Management Area (Figure 13). Both these quaternary catchments has been allocated a Present Ecological State (PES) of 'Largely natural' (B) by Delport and Mallory (2002) and Smook et al. (2002), and information regarding mean annual rainfall, evaporation potential and runoff for these quaternary catchments are provided in Table 6.

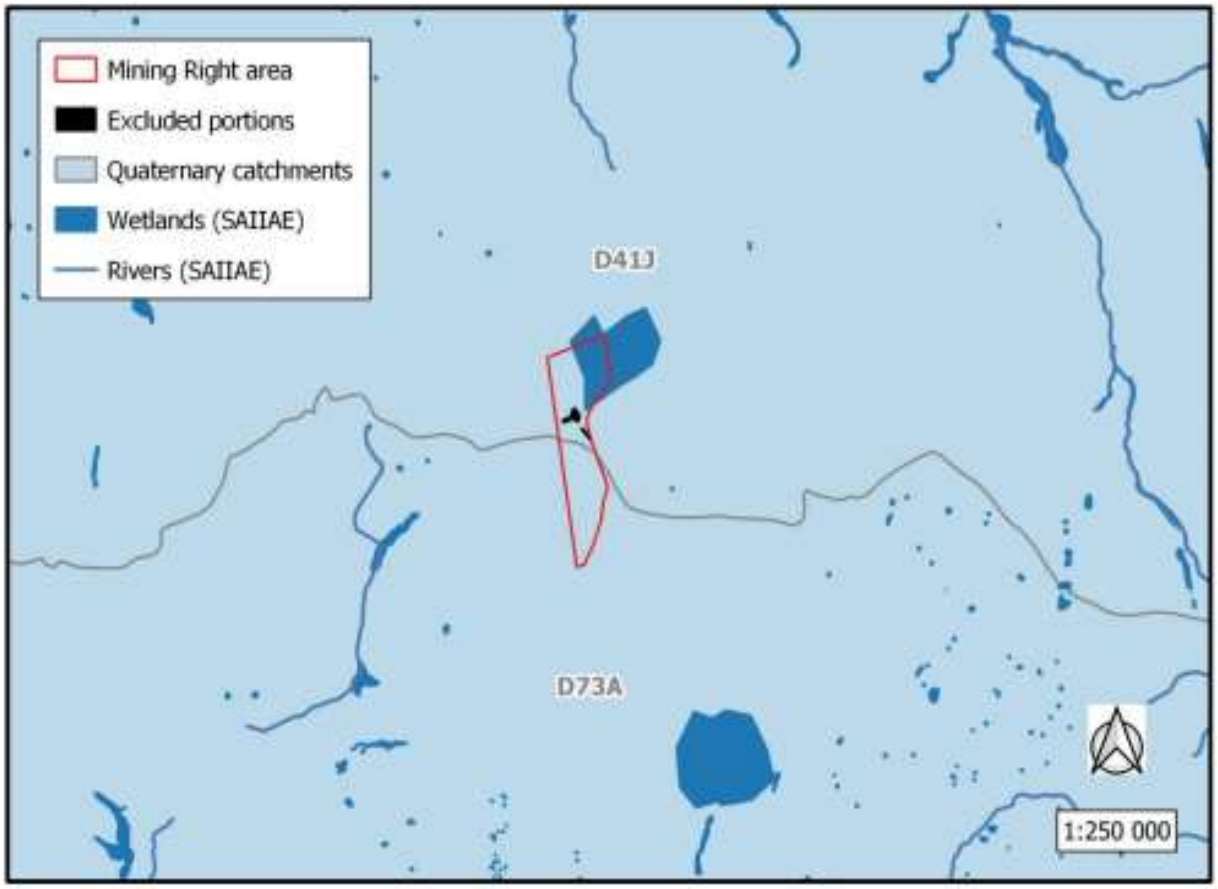

Figure 13. The locality of the proposed Glosam Mine in relation to quaternary catchments.

Table 6. Catchment characteristics for the Molopo- (Delport and Mallory 2002) and Neusberg (Smook et al. 2002) quaternary catchments in which the study area fall.

WMA	Quaternary catchment	Catchment Area (km^2)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff (10^6 m^3)
Lower Vaal	D41J (Molopo)	3 878	358	2 350	4.85
Lower Orange	D73A (Neusberg)	3 238	*Not provided*	*Not provided*	*Not provided*

According to The South African Inventory of Inland Aquatic Ecosystems (SAIIAE), Glosam falls within the Eastern Kalahari Bushveld Bioregion, where 1.3 % of the land area is covered by inland wetlands, including depressions, floodplains, seeps and valley-bottom wetland types (Van Deventer et al. 2019). The spatial extent according to the present ecological status per wetland type is depicted in Table 7. Depressional wetlands are most abundant in this bioregion, with the majority being severely modified. Most of the remaining wetland types in this Bioregion are also moderately- to severely modified.

Table 7. Percentage of inland wetland spatial extent according to the present ecological status per wetland type of the Bioregion in which the proposed mining area falls.

Bioregion	Wetland type	Total Extent (%)	% Natural or near-natural (A/B)	% Moderately modified (C)	% Heavily to severely/critically modified (D/E/F)
Eastern Kalahari Bushveld	Depression	57.1	70.5	5.7	23.8
	Floodplain	2.2	0.6	48.8	50.5
	Seep	17.2	10	15.1	75
	Valley-bottom	23.5	0.9	29.6	69.5

One seep wetland occurs in the north-eastern corner of Glosam (Figure 13). According to SAIIAE it has already been critically modified by roads, railways and historic mining activities. Many of the drainage lines on Glosam have also already been destroyed by historic mining activities. However, an ephemeral stream and its associated drainage lines are still present in the southern half of the property (Figure 13).

No activity may take place within a watercourse unless it is authorised by the Department of Water and Sanitation (DWS). Any area within a wetland or riparian zone is therefore excluded from development unless authorisation is obtained from the DWS in terms of Section 21 (c) and (i).

- ***GROUND WATER:***

  According to the 1:1 000 000 Hydrogeological Map series of South Africa, Glosam is associated with fractured- and karst aquifer systems (Figure 14), with depths of 21 – 23 mbgl and average borehole yield

ranging from 0.5 to 2.0 l/s. Both aquifers fall within a minor aquifer region (Matoti et al. 1999a), which is moderately-yielding aquifer systems of variable water quality. The fractured aquifer on Glosam has low susceptibility for contamination by anthropogenic activities and is regarded least vulnerable , however, the karst aquifer has high susceptibility for contamination by anthropogenic activities and is regarded most vulnerable (Matoti et al. 1999c, b)

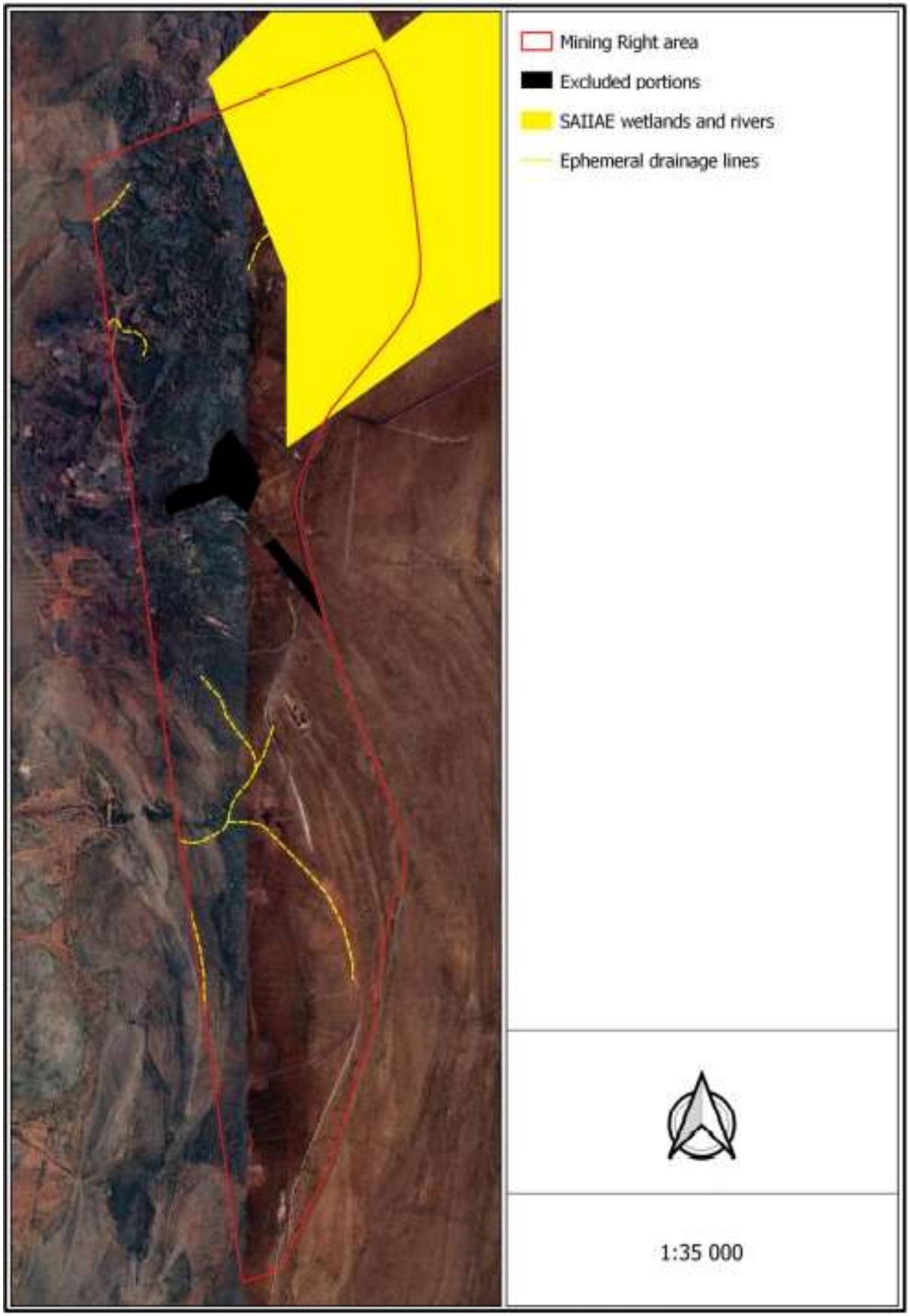

FIGURE 14. The location of SAIIAE (South African Inventory of Inland Aquatic Ecosystems) wetlands and natural drainage lines in relation to the proposed mining right area.

Figure 15. The location of aquifer systems in relation to the proposed mining right area.

- ***AIR QUALITY AND NOISE:***

  With reference to the Scheduled Processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), no scheduled process relates to any proposed mining activity.

  The current source of air pollution in the area stems from mining operations near Postmasburg and from vehicles travelling on the gravel roads of the area. No farming activities related to dust generation, such as ploughing, are known to occur in the area.

  The potential source of air pollution on Glosam will be nuisance dust generated by the mining activities such as the blasting, hauling, crushing & screening as well as from the movement of vehicles on the site roads. Generated dust will be visible from the secondary gravel road and to local farm residents. Any potential fall-out dust will impact those who reside on the farm.

  Noise on site will be generated by the blasting and yellow gear. Although these activities do generate noise, the overall impact can be described as negligible. The most susceptible receptors of noise will be the local farm residents.

  A specialist company will be appointed to conduct a baseline noise study. The findings of this report will be included in the EIA/EMPR document.

- ***VISUAL ASPECTS:***

  The mining site is not at all visible from any main tourist route or main route. The mining operation will also not be visible to the neighbour since it is located within a rural landscape and shaded by vegetation. The negative visual impacts associated with open excavations. There is however no method of reducing the impact during mining operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of open excavations as mining progress.

- **SITE SENSITIVITY & *BROAD-SCALE ECOLOGICAL PROCESSES:***

  Northern Cape Critical Biodiversity Areas
  The proposed mining site falls within critical biodiversity areas, as defined by the Northern Cape Critical Biodiversity Areas Map (Holness and Oosthuizen 2016). This map identifies biodiversity

priority areas, called Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs), which, together with protected areas, are important for the persistence of a viable representative sample of all ecosystem types and species as well as the long-term ecological functioning of the landscape as a whole. Almost the entire study area comprises of Ecological Support Areas and Other Natural Areas (Figure 15). No Critical Biodiversity Areas One, Critical Biodiversity Areas Two, or Protected Areas occur in or near the study site.

Mining and Biodiversity Guidelines

Similarly, the Mining and Biodiversity Guidelines (DENC et al. 2013) does not classify any section of the study area to have biodiversity importance, and therefore does not constitute a high risk for mining. These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining in order to support mainstreaming of biodiversity issues in decision making in the mining sector.

Conservation planning

Furthermore, the broad-scale vegetation units that cover the study area (Kuruman Mountain Bushveld and Kuruman Thornveld) is classified as least threatened and therefore no formal fine scale conservation planning has been conducted. Kuruman Mountain Bushveld has however been identified as a medium conservation priority area within the Siyanda Environmental Management Framework. The study area does however not fall within a proposed conservation area for the District Municipality, but has been included within the Siyanda Environmental Control Zone 1; i.e. a zone with potential sensitive groundwater resources. The karst aquifers that occur in the dolomite and lime stone rocks in the area represent a major strategic water resource. It is sensitive both in respect to the abstraction and potential pollution of groundwater. Therefore, a suggested management parameter is to prohibit the bulk storage of hazardous substances as well as unrehabilitated spoil heaps and mine dumps.

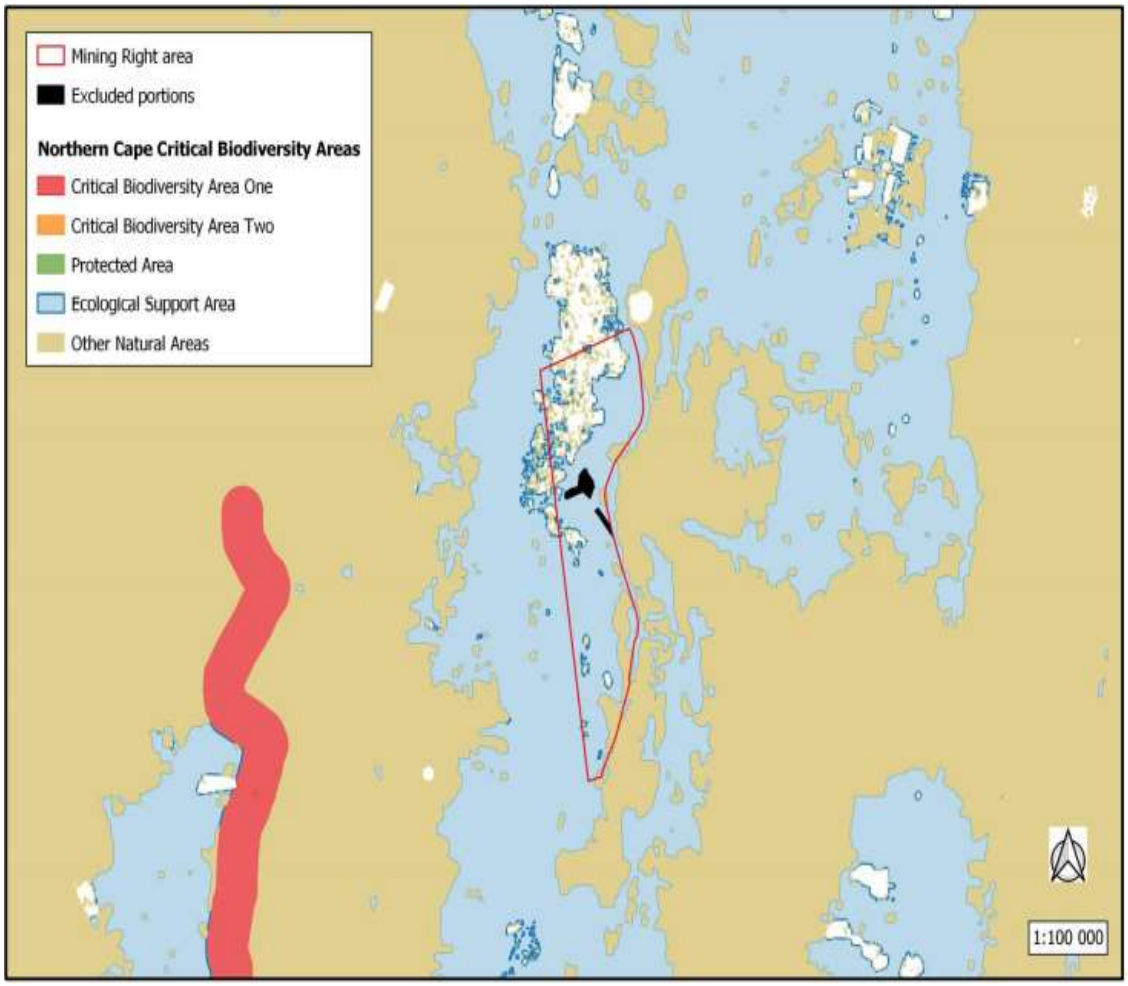

Figure 16. The study area in relation to the Northern Cape Critical Biodiversity Areas. (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

Environmental Screening

The National Web based Environmental Screening Tool does consider parts of the study area to be sensitive. This tool is a geographically based web-enabled application which allows a proponent intending to submit an application for environmental authorisation in terms of the Environmental Impact Assessment (EIA) Regulations 2014 (as amended), to screen their proposed site for any environmental sensitivity. Glosam is considered to be of low sensitivity based on the Plant- and Animal species Themes. Large parts of the study area are however considered to be of very high sensitivity based on the Aquatic- and Terrestrial Biodiversity Themes. The Terrestrial Biodiversity sensitivity is a direct function of the Ecological Support Areas classification on the Northern Cape Critical Biodiversity Areas Map. The Aquatic Biodiversity sensitivity is attributed to two factors. The seep wetland in the north-east of Glosam is regarded as a sensitive water resource, while quaternary catchment D73A, which comprise the southern half of Glosam, falls within a freshwater ecosystem priority area quinary catchment.

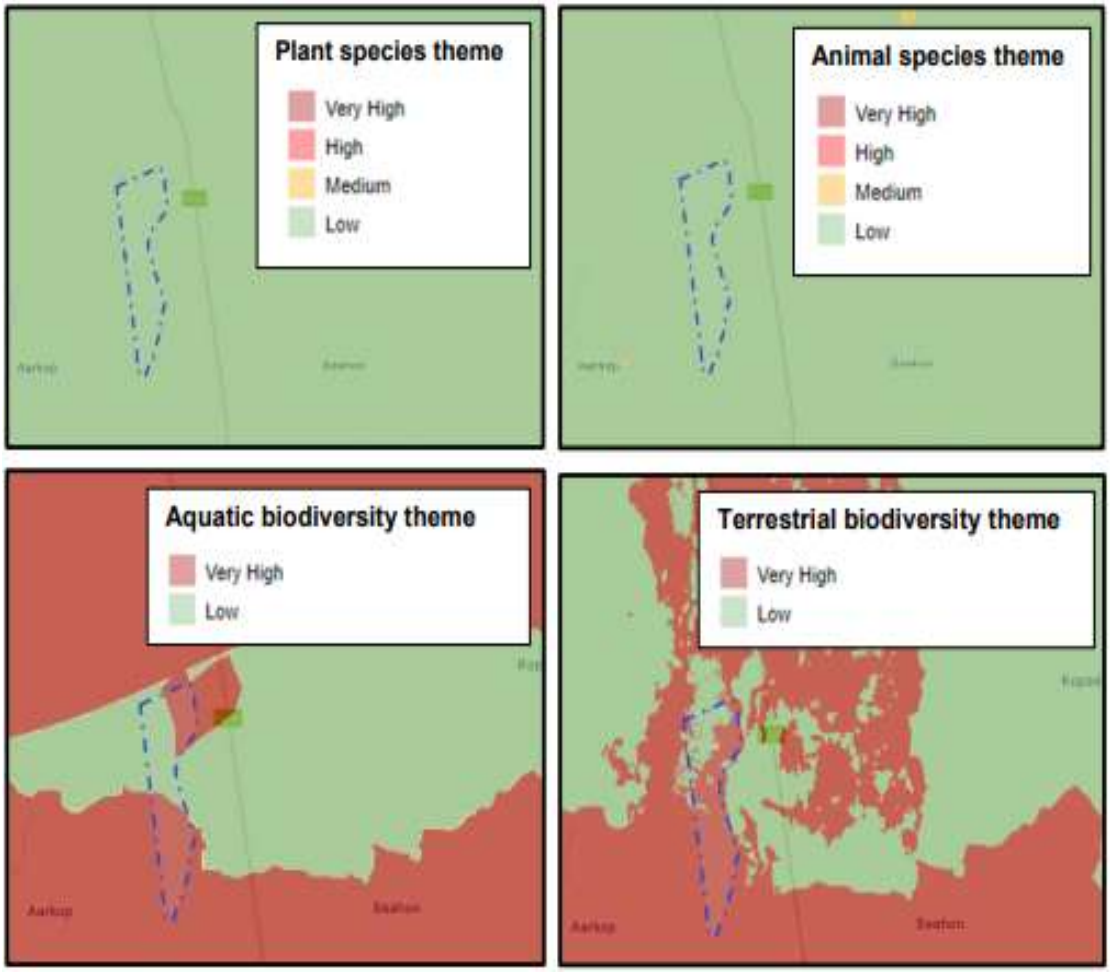

Figure 17. Environmental sensitivities associated with the study area, according to the National Web based Environmental Screening Tool.

Centres of Endemism

The study area also falls within the core area of the Griqualand West Centre (GWC) of Endemism (Frisby et al. 2019) (Figure 17). A centre of plant endemism is an area with high concentrations of plant species with very restricted distributions, known as endemics (Van Wyk and Smith 2001). Relatively small disturbances in a centre of endemism may easily pose a serious threat to its many range restricted species. Endemics are specifically vulnerable due to their restricted distribution ranges. Glosam falls within the Ironstone Hills - Asbestos Hills floristic region of the GWC. Fifteen of the 25 endemic and near endemic taxa identified in the GWC occur in this floristic region.

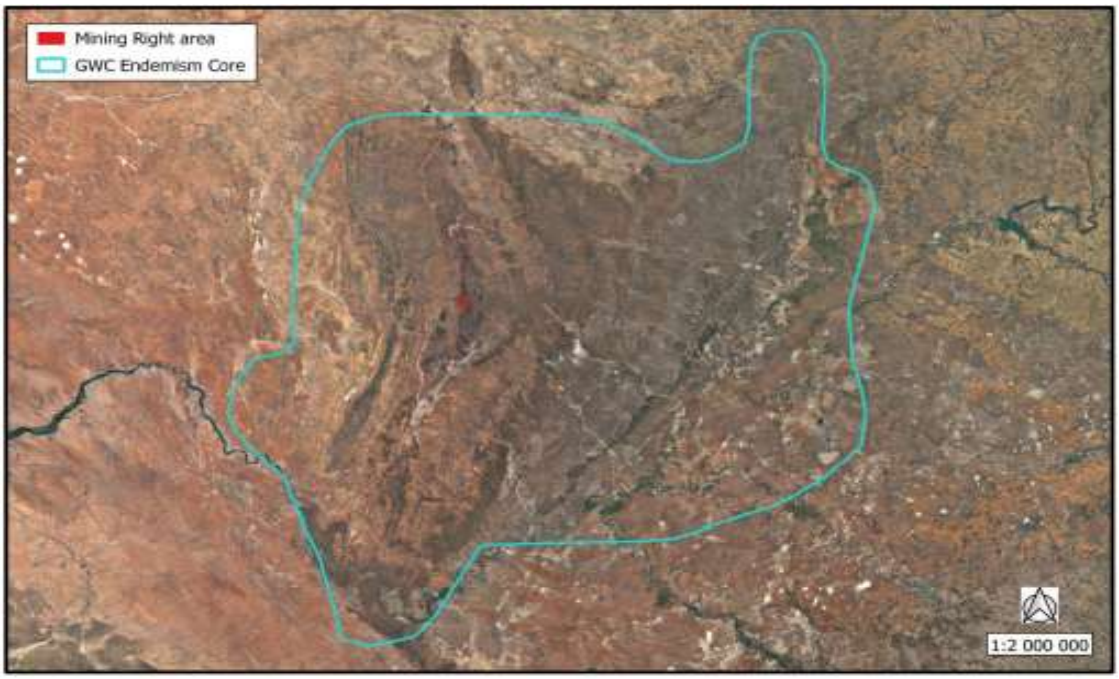

Figure 18. The Glosam Mining Right Application area in relation to the GWC core, according to Frisby et al. (2019).

Landscape-level wetland threat status

Within the vicinity of the proposed mining operation, the ecosystem threat status for most wetlands has been classified as Least Concern. However, two seeps, including the one occurring on site, are classified as Critically Endangered (Figure 19) and both are poorly protected.

Figure 19. The ecosystem threat status of wetlands occurring in the vicinity of the proposed mining right area

Cumulative mining status overview

The study area falls within a zone where South Africa's largest economically most important deposits of manganese and the principle deposits of iron ore are found. The manganese zone extends northwards over a distance of 150 km, from just south of Postmasburg to as far as the Wessels and black rock Mines north of Hotazel, while the most significant iron ore deposits occur in the vicinity of Postmasburg and Sishen (Figure 20). The Glosam mining activities are therefore expected to contribute to the cumulative effect of mining in the region.

Site Sensitivity

The sensitivity map for the proposed mining operation is illustrated in Figure 21. The ephemeral stream and seep is considered to be of very high sensitivity. Both these are watercourses, protected in terms of the National Water Act (Act No 36 of 1998) and play important hydrological functional roles in the catchment area. Furthermore, the seep is classified as a Critically Endangered Wetland Ecosystem. The ephemeral stream is also thought to host unique species adapted to ephemerality, which causes them to respond only when conditions are ideal. Very little is known about the ecological functioning of ephemeral streams, but it can be expected that when such habitats are destroyed, species are lost, along with potentially valuable scientific information.

The small pocket of sand in the south-western corner of the study area are also considered to be of very high sensitivity due to the high density of species of conservation concern, particularly Boscia albitrunca, found here. Such isolated communities are islands that usually host unique species assemblages compared to the surrounding communities and should be preserved.

The hills and ridges in the north and south-west of the study area, as well as the thornveld on historic mine footprint are considered to be of high sensitivity. Even though some of these areas have been mined historically, dense vegetation has re-established in the old pits over the past 30 years. Not only does a number of protected plant species occur here, but the rocky- and dense shrubland habitats are expected to provide unique micro habitats to various small mammals, reptiles and birds. Their steep slopes also provide high erosion risks during runoff. The ridges and historic mine footprint in particular fall within the core area earmarked for mining activities.

The remaining shrubland on the plains is considered to be of medium sensitivity on account of the low density of protected plant species found here. Even though this area is underlain by a karstic aquifer, the core mining activities are not expected to take place here. Any mining associated activities should nonetheless be strictly controlled in order to limit impacts on the species of conservation concern that do occur within the unit and any to prevent potential pollution to the aquifer.

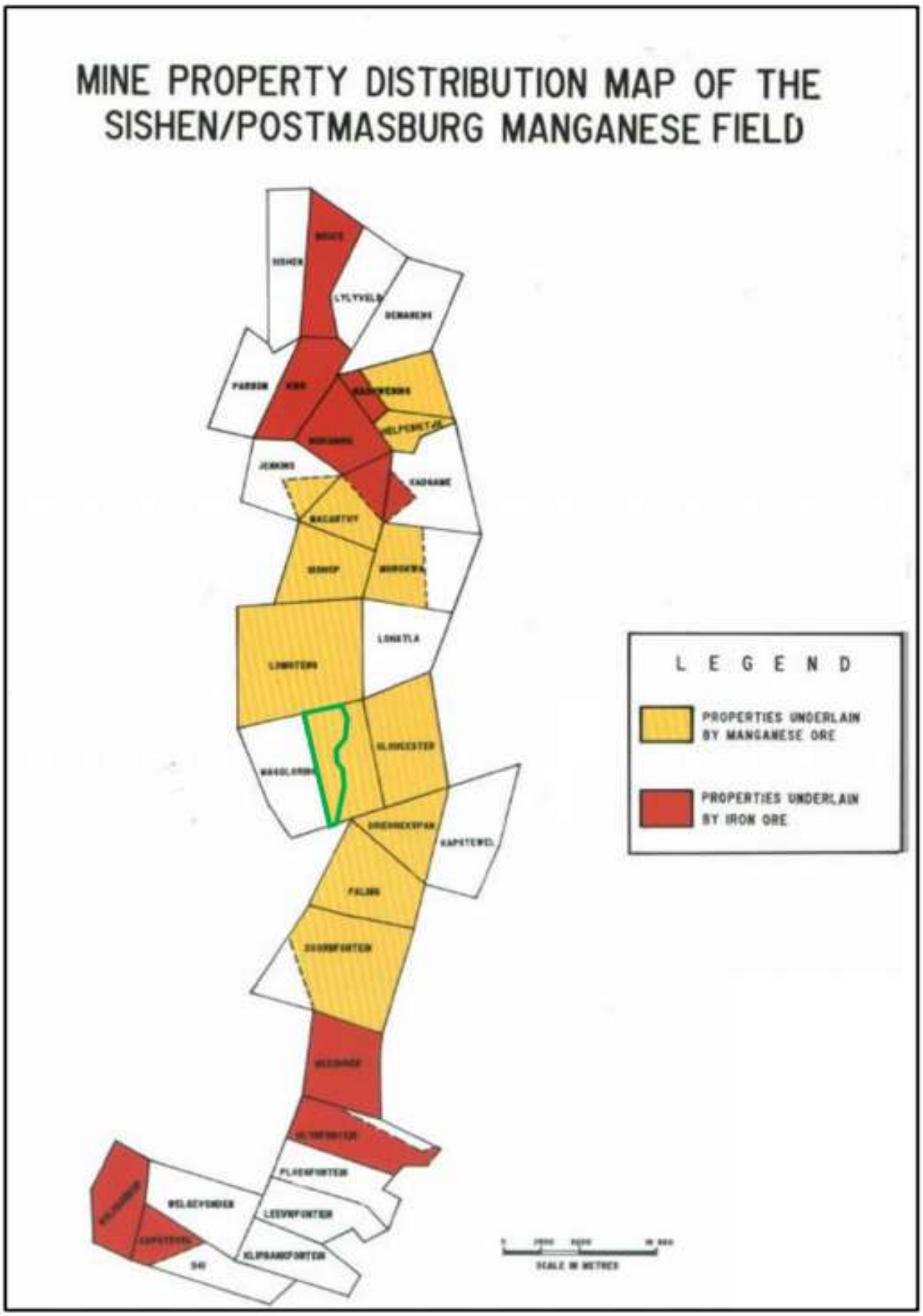

Figure 20. The distribution of mining properties in the Sishen/Postmasburg Manganese Field (Bonga 2005), with the proposed mining area indicated in green. (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

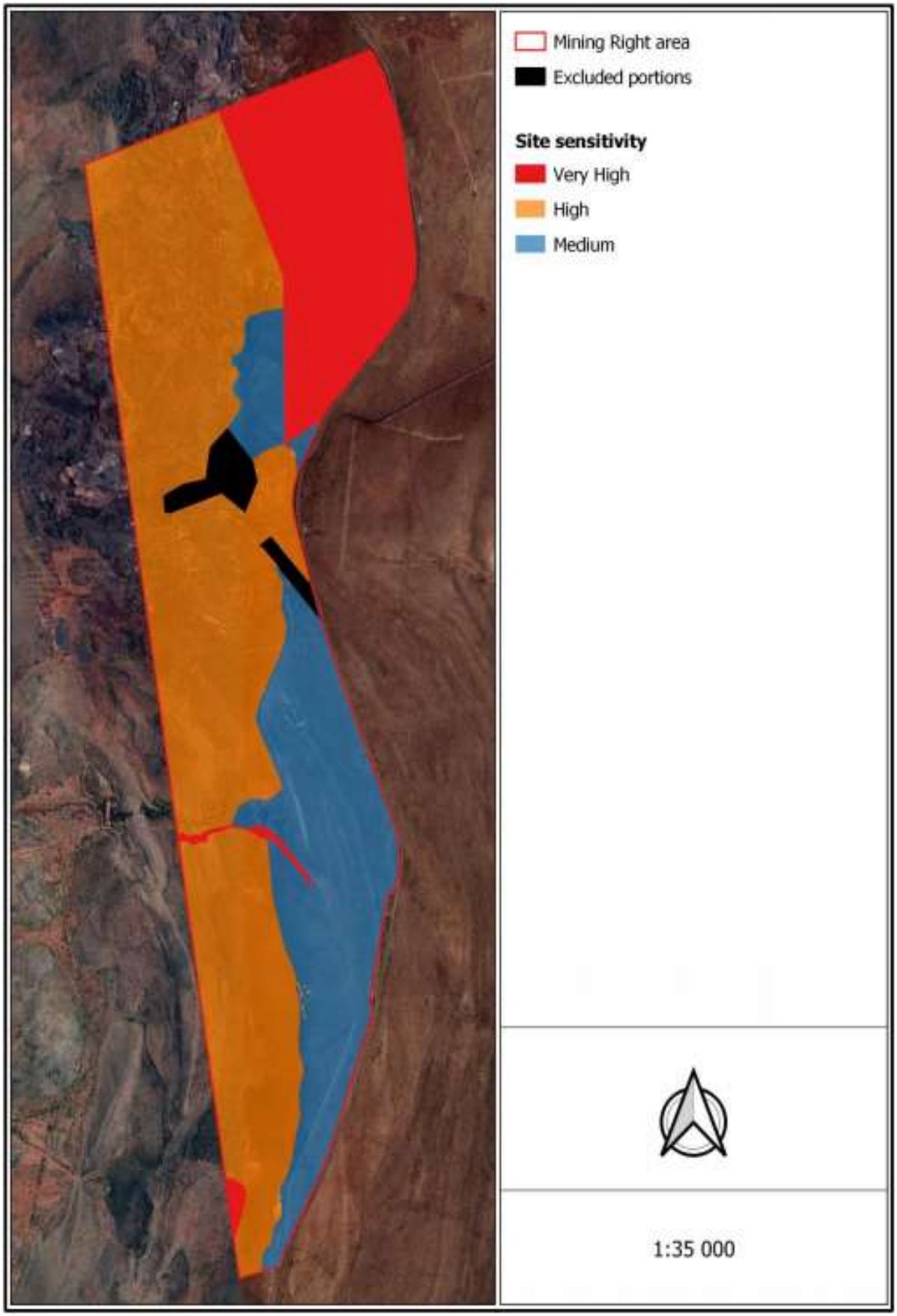

Figure 21. A sensitivity map for the proposed mining area. (map taken out of the Ecological Study of Boscia Ecological Consulting, January 2021).

- **Socio-Economic:**

Basic Municipal Profile – Tsantsabane Municipality
[Information obtained from the Tsantsabane IDP]

(a) *Geographical Profile:-*

Wepex operation is located within the Tsantsabane Municipal area in Postmasburg, Northern Cape.

Tsantsabane Local Municipality is located within the north-eastern part of the Northern Cape Province, and falls within the boundaries of the ZF Mgcawu District (previously Siyanda District). The nearest business centre is Kimberley, which is about 200 km away. Three main traffic routes provide access to other cities, namely Johannesburg via Kuruman, and the Kalahari and Cape Town via Kimberley. The rest of the Tsantsabane Municipality area comprises of Boichoko, Postdene, New Town, Stasie, Groen Water, Skyfontein, Jean Heaven, Marenane (the newly established settlement brought about by the land restitution) and the well-known Lohatlha Army Battle School.

Economically, Tsantsabane is known for being rich in minerals, and for its mining, agriculture, manufacturing and farming sectors. Tsantsabane has reinvented itself over the years as one of the leading investment hot spots in the Northern Cape.

(b) *Key Economic Activities:-*

Key socio-economic information of the area can be summarised below:-

- 60% of the population is below the age of 20 years;
- Unemployment currently is around 23%;
- The Tsantsabane municipal area has a population of 32 000 of which 48% is Male and 52% Female;
- The dependency ratio is around 1,93%;
- 97% of the population are in the low and medium income category.

The breakdown of skills is as follows:-

- 20% unskilled;
- 54% semi-skilled;
- 23% skilled and only;
- 3% are highly skilled.

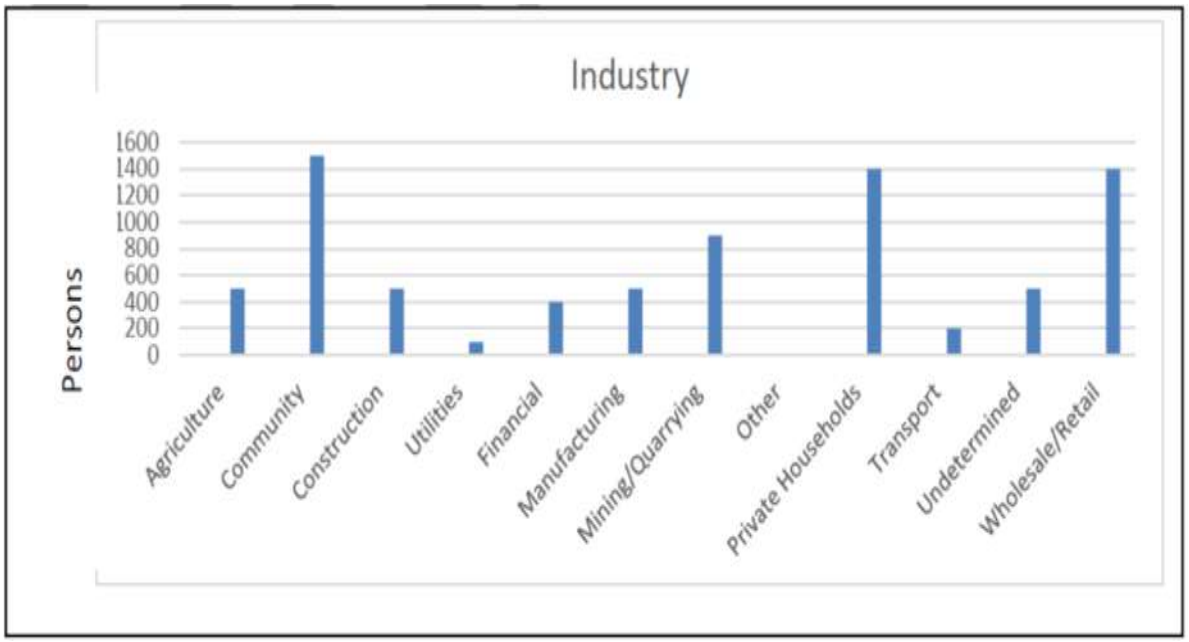

Figure 22. Main economic activities in the area surrounding the farm.

As seen in the above graph, the key economic activities in the community are Community/Social/Personal, Mining/Quarrying, Private Households, Wholesale/Retail, Financial/Insurance/Real Estate/Business and Manufacturing.

Wepex Trading will contribute greatly in the development of the Mining Industry, leading it to be a more positive and effective economic activity in this area.

(a) *Population:-*

The population figures in terms of census 2011 is 35 093 compared to 31 014 in 2001. The male population has increased with 24% while the female population has increased with only 2.7% since 2001. This increases can be relatively influenced by job migration and other factors.

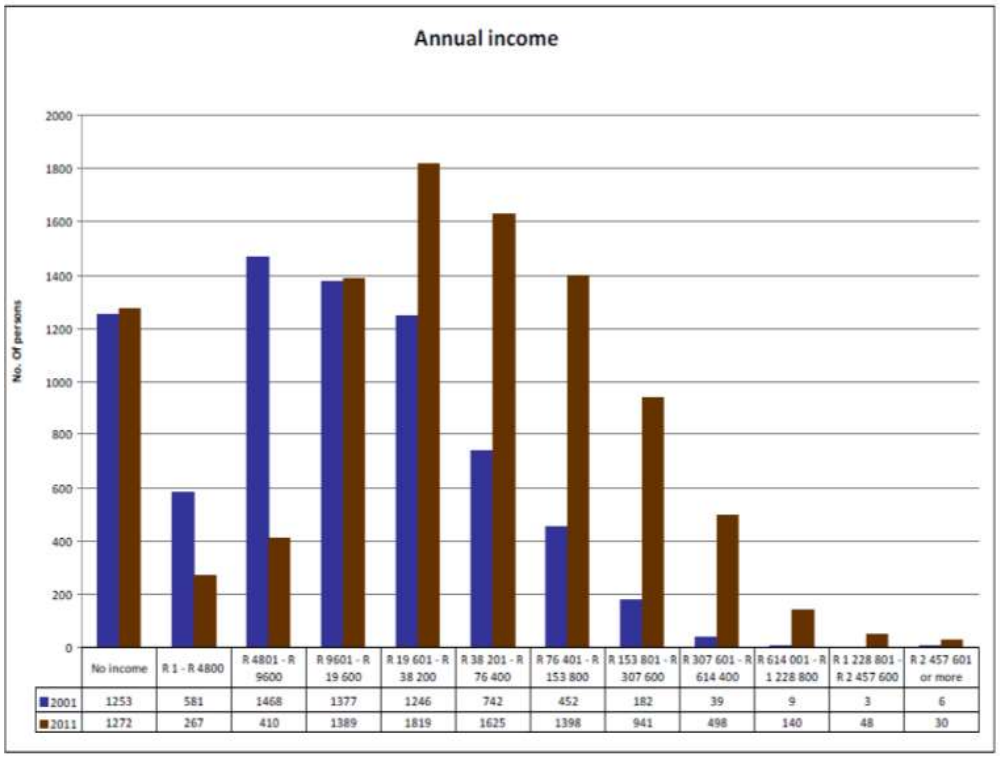

Figure 23. Annual Income

(b) *Gender by Age:-*

According to Statistics SA Census Data (2011) the population of Tsantsabane increased from 30 862 in 2001 to 35 093 in 2011. The age structure also indicates the population of Tsantsabane as predominantly young. The group of people older than 60yrs of age is rather small in relation but could still cause a dependency burden. The age structure further indicates that ±31% of the population is under 14 years and ±33% is between 15 and 34 years. If it is accepted that 70% of the under-20 are dependant, it would cause that ±30% of the residents of the economically active part of the population is dependant. The large amount of unemployed, especially amongst the disadvantaged group worsens the influence of this problem.

(c) *Highest Education:-*

The statistics indicate that although a high number of students enrolling for primary school a very low number of students complete Grade 12. This result in a very low probability for employment. Only 5% of those who enrolled for grade 1 make it into tertiary. Less than 15% of the population has a tertiary qualification or have completed Grade 12. It must, however, be mentioned that the education level is affected negatively by the urbanization process, in the past since it mostly involves

matriculates and those with a better qualification, due to the local lack of job opportunities.

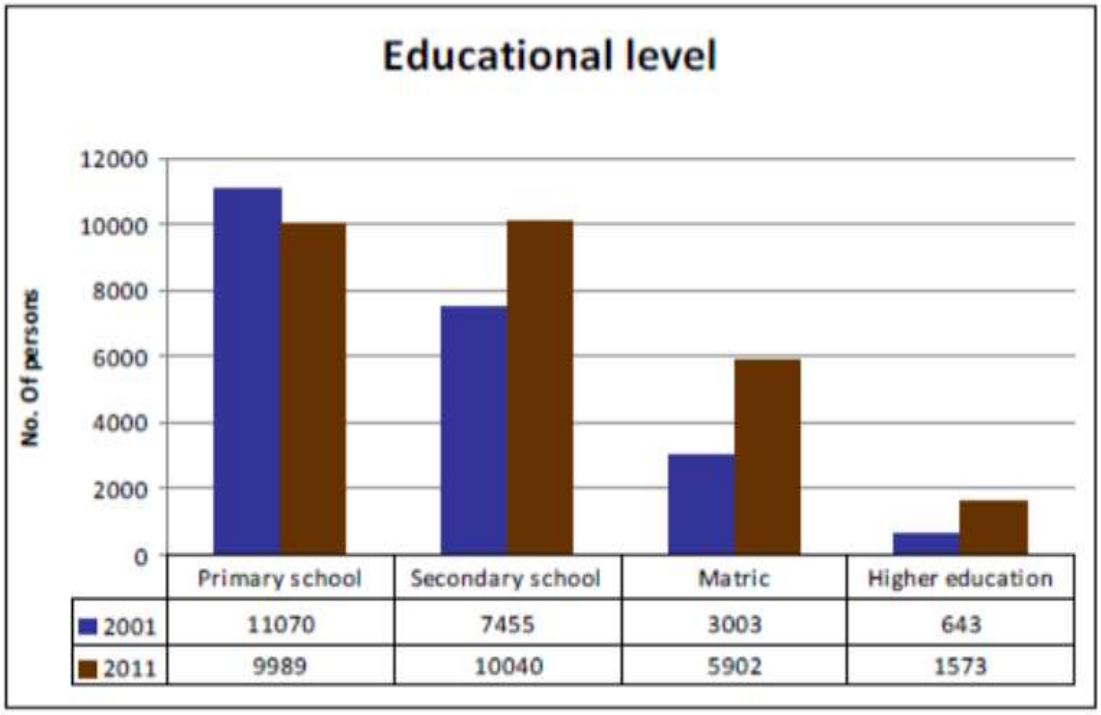

Figure 24. Education Institutions being attended by 5 to 24 year olds

(d) *Labour Force:-*

According to the stats the unemployment figure 25 has drastically reduced from 4 466 in 2001 to 3 795 in 2011 which shows a decrease of -15%. Employment has increased with 69% in 2011, which translates in more people working in 2011 than 2001. If the jobs are permanent than it attributes to higher level of skills.

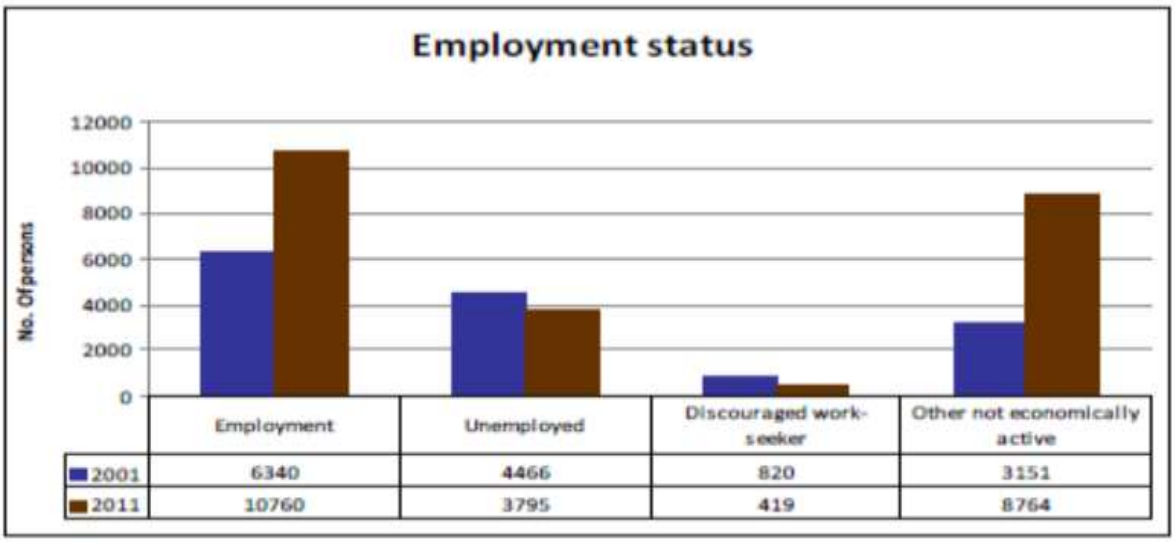

Figure 25. Employment Status

(e) *Land Use:-*

Tsantsabane is characterised by a mixture of land uses of which agriculture and mining is dominant within the rural areas. Although diamonds have been mined since 1892, the most important mineral currently mined is manganese. The residential areas vary between relatively large towns (Postmasburg) to small scattered rural communities – some of the remains of railway stations.

- Archeological

Prof. AC van Vollenhoven from Archaaetonos Culture en Cultural Resources Consultants were appointed by Wepex Trading (Pty) Ltd to provide an Cultural Heritage Impact assessment study in order to highlight the cultural characteristics of the proposed mining area and to determine the possible impact of mining on the cultural status of the application area. (The study is attached as Appendix 5)

Findings: During the survey twenty-one sites of cultural heritage significance were identified within the immediate project area. Recommendations:

- Site 12 (farm yard) and 15 and 20 (railway sidings) are all outside of the development boundary. Site 12 has no cultural heritage value and this report is seen as ample mitigation. The structures are younger than 60 years. It needed, may be demolished without a permit from SAHRA.
- The railway sidings receive a field rating of Local Grade IIIC. The description in the phase 1 heritage report is seen as sufficient recording and it may be granted destruction if needed.
- The remains of industrial building (site 6), the base of a water reservoir (site 9), the office complex remains (site 10), various remains of brick buildings (site 11) and the farm yard (site 18) has no cultural heritage value. This report is seen as ample mitigation. The structures are younger than 60 years and in a very poor condition. It may be demolished without a permit from SAHRA. .
- The foundation (site 5), concrete building remains (site 16) and metal framework of an industrial building (site 21) has no cultural heritage value and may therefore be demolished. Since it is older than 60 years, a permit would be required from the SAHRA.
- For the three mine houses (site 4) the field rating of the site is Local Grade IIIC. The description in this phase 1 heritage report is seen as sufficient recording and it may be granted destruction at the discretion of the relevant heritage authority without a formal

permit application, subjected to the granting of Environmental Authorisation. The mine does not currently have any plans that will impact here. Also, since the buildings are younger than 60 years, no permit is currently required.

- The old hostel area and recreation hall (site 2) is regarding as having a field rating of Local Grade IIIC. The description in this phase 1 heritage report is seen as sufficient recording and it may be granted destruction. As both structures are younger than 60 years, no permit from SAHRA is needed.
- The field rating for the ore loading bays (site 7, 14 and 19) Local Grade IIIC. The description in the phase 1 heritage report is seen as sufficient recording and it may be granted destruction. Since these sites are all younger than 60 years and in a very poor condition, it may be demolished without a permit from SAHRA.
- The field rating of the Glosam Mine Village (site 3) is Local Grade IIIB. The site should be included in the heritage register and may be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority.
- The village is older than 60 years and is regarded as being very unique and typical of such a mining village. Therefore at least the first sixteen houses, social area, hall and other structure within the inner circle of the village should be preserved. It may however be utilized for another purpose, being a youth camp, holiday resort or guest house. It would be good to also preserve the outer circle as it is part of the original lay-out plan, although most of the buildings are much younger.
- The mine does not intend to do any work here at present. If needed, for any changes to the buildings older than 60 years, a permit would be required from the SAHRA.
- The Miners boxes (sites 1, 13 and 17) are regarded as having a field rating of Local Grade IIIB. The sites should be included in the heritage register and may 5 be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority.
- In this case, site 1 should be kept intact and preserved, meaning that a management plan should be drafted for the site. It should also be fenced in.
- Sites number 13 and 17 may be demolished, but only after complete documentation thereof and only if site number 1 remains intact. This documentation includes doing test excavations and drawing a site map.
- The loading platform (site 8) has a field rating of Local Grade IIIB. The site should be included in the heritage register and may be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority. As it is typical of a certain era in the mining industry, it should be preserved, perhaps as part of an

interpretive route. It may be utilized in further mining activities, but a management plan would be needed for that.

- The proposed development may continue, but only after receiving the necessary approval from SAHRA if the loading platform needs to be removed(which is not anticipated).
- It should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Due to the density of vegetation it also is possible that some sites may only become known later on. Operating controls and monitoring should therefore be aimed at the possible unearthing of such features. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.

- In This regards the following 'Chance find Procedure' should be followed:

1. Upon finding any archaeological or historical material all work at the affected area must cease.
2. The area should be demarcated in order to prevent any further work there until an investigation has been completed.
3. An archaeologist should be contacted immediately to provide advice on the matter.
4. Should it be a minor issue, the archaeologist will decide on future action, which could include adapting the HIA or not. Depending on the nature of the find, it may include a site visit.
5. SAHRA's APM Unit may also be notified.
6. If needed, the necessary permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist.
7. The removal of such archaeological material will be done by the archaeologist in lieu of the approval given by SAHRA, including any conditions stipulated by the latter.
8. Work on site will only continue after removal of the archaeological/ historical material was done.

Prof. Marion Bamford (Palaeobotanist) from archaeological & Heritage Services Africa (Pty) Ltd Consultants were appointed by Wepex Trading (Pty) Ltd to provide an palaeontological Impact assessment study in order to highlight the plaeontological characteristics of the proposed mining area and to determine the possible impact of mining on the cultural status of the application area. (The study is attached as Appendix 6).

Executive Summary

A palaeontological Impact Assessment was requested for the prospecting rights applications for Glosam Mine, approximately 20 km north of Postmasburg, Northern Cape Province. To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the application.

The proposed site lies on the dolomites of the Reivilo Formation (Campbell Rand Subgroup, Ghaap Group, Transvaal Supergroup) that is composed of giant stromatolites in some areas.
Since there is a very small chance of fining fossil algal cells in the traces fossils, i.e. stromatolites, a Fossil Chance Find Protocol should be added to the EMPr.

Based on this information it is recommended that no palaeontological site visit is required unless the geologist, environmental office or responsible person finds fossils, sends photographs to a palaeontologist to be assessed and the palaeontologists recommends collection, with a valid SAHRA permit. It is the opinion of the palaeontolotogist that the prospecting right be granted.

(b) Description of the current land uses.

- **Current land use:**

The major land uses in the region are mining (manganese and iron ore) and agriculture. According to the Southern Africa Agricultural Geo-referenced Information System, the land capability of the plains in the east is non-arable with low potential grazing land, while the hills in the west are considered to be wilderness. The grazing capacity is between 18 and 30 ha/AU, with the agricultural region being demarcated for cattle farming. The property is categorised to have no suitability for crop yield.

- **Evidence of disturbance:**

Glosam is characterised by a fairly complex mining history. Various formal and informal mining companies have mined the area for iron ore and manganese between the late 1920s and 1984. This produced numerous open pits scattered across the site. These pits and associated road networks are still visible today as well as various buildings and structures related to the past mining activities; some of which are of archaeological significance. Exploration activities have also been performed over the past decade.

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

The infrastructure on site is comprehensively discussed in section d) ii) as part of the methodology discussion and a basic description of the environment was presented in section h iv) (A) as part of the baseline report. Specific environmental features and infrastructure will be comprehensively discussed in the EIA report after all specialist assessments have been completed.

- **Existing structures:**

Current land use activities on the prospecting right include site infrastructure and security office for the neighbouring Emang Mmogo Mine, two cell phone reception towers managed by MTN can Cell C, a number of ESKOM power lines and Sedibeng Water reservoir and pipeline infrastructure. Areas in the south of the prospecting right area are mainly used for grazing by livestock and wildlife and a Transnet railway track lines the eastern border of the prospecting right area. This railway line links the Kalahari mines with Port Elizabeth via Kimberley.

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

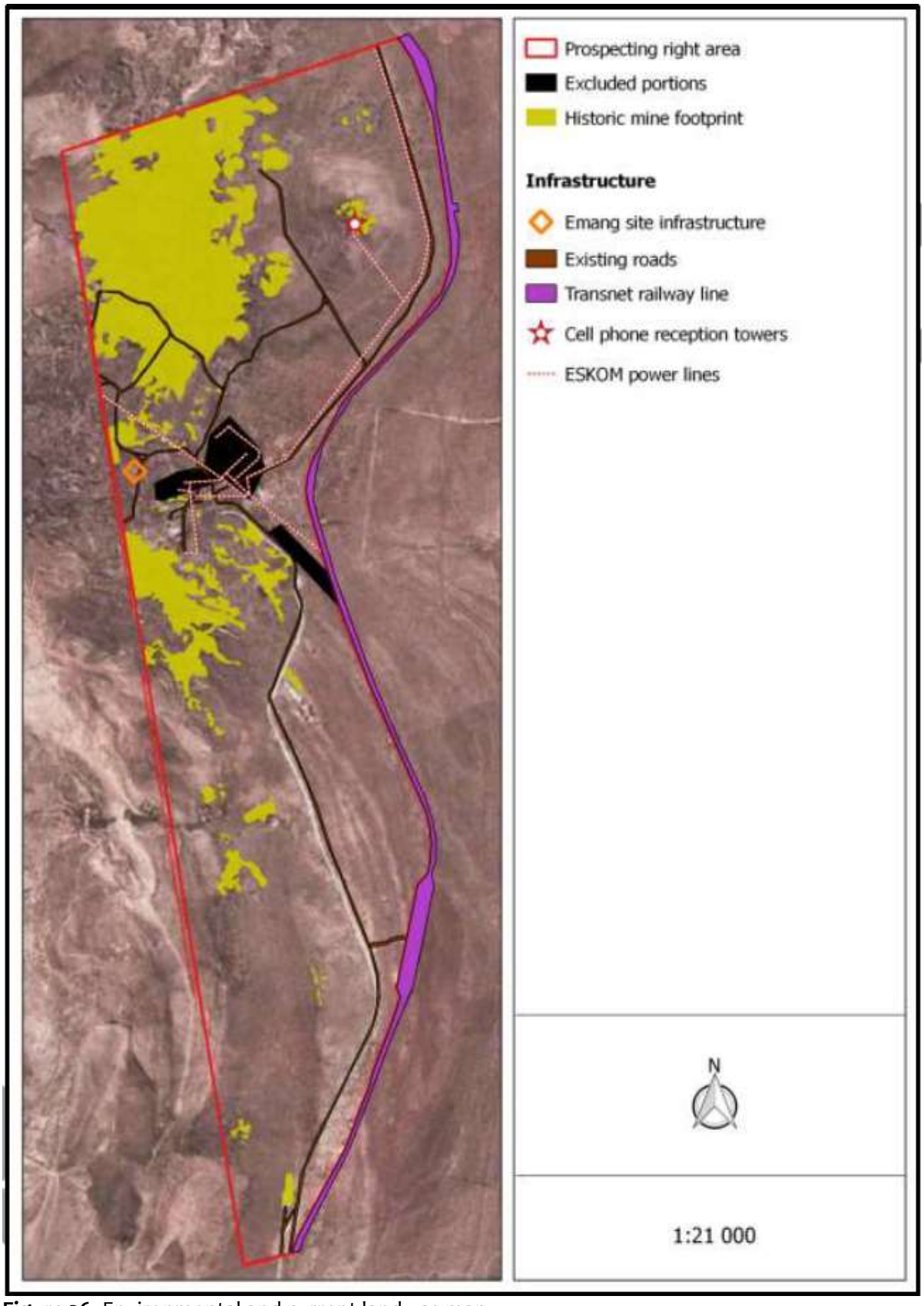

Figure 26. Environmental and current land use map

(v) Impacts identified:

(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.)

Environmental Factor	Nature of Impact	Significance	Probability	Duration
Geology and Mineral Resource	Sterilisation of mineral resources	Very low	Highly unlikely	Decommissioning
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Medium	Possible Frequently	Decommissioning
Soils	Soil Erosion Infrastructure; Excavations.	Low- Medium	Possible Frequently	Decommissioning
	Nature of Impact	Significance	Probability	Duration
	Loss of soil fertility During the removal of topsoil; stockpiling.	Medium -High	Certain for life of operation	Residual
	Nature of Impact	Significance	Probability	Duration
	Soil pollution Spillage of hazardous material; runoff.	Medium-High	Certain for life of operation	Residual
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Low-Medium	Possible Frequently	Residual
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Low-Medium	Possible Frequently	Residual
Ground Water	Nature of Impact	Significance	Probability	Duration

Quantity	**Contamination of the Aquifer** Hydrocarbon Spills Hydrocarbon spills from construction vehicles and fuel storage areas may contaminate the groundwater resource locally	Medium -High	Possible for life of Operation	Permanent
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Surface Water	• **Siltation of surface water** • Ground works and stripping of vegetation resulting in a changed land profile. • Runoff from stockpiled soil and vegetation may contain high levels of silt.	Low-Medium	Possible infrequent	Decommissioning
	• **Contamination of Surface Water** • Spillages that may occur on access and haul roads may impact negatively on surface water quality. This issue is dealt with in the EMP. • A high potential of soil erosion exists due to an increased percentage of bare surfaces.	Low-Medium	Possible infrequent	Residual
	• **Contamination of Surface Water** • Possible leaching of polluted soil through infiltration and runoff resulting in surface water pollution. • Removal of vegetation could lead to erosion and sediment transportation.	Low-Medium	Possible infrequent	Decommissioning

	• Significant dust levels will emanate from the use of heavy construction vehicles.			
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Indigenous Flora	**Loss of and disturbance to indigenous vegetation** Construction of roads, plant site, as well as other necessary infrastructure; placement of stockpiles; and the clearing of vegetation for mining, materials storage and topsoil stockpiles; vehicular movement.	Low to medium	Certain for life of operation	Residual
	Loss of flora with conservation concern Removal of listed or protected plant species; during Construction of new roads and other necessary infrastructure, the placement of stockpiles; and clearing of vegetation for excavations.	Medium-High	Certain for life of operation	Residual
	Proliferation of alien vegetation Clearing of vegetation; mining activities	Low-Medium	Possible frequently	Residual
	Encouragement of bush encroachment Clearing of vegetation; disturbance through mining activities.	Low	Possible infrequently	Residual

Fauna	**Loss, damage and fragmentation of natural habitats** Clearance of vegetation; mining activities	Medium-High	Certain for life of operation	Residual
	Disturbance, displacement and killing of fauna Vegetation clearing; increase in noise and vibration; human and vehicular movement on site resulting from mining activities.	Low-Medium	Certain for life of operation	Decommissioning
Air Quality	Sources of atmospheric emission associated with the mining operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low-Medium	Certain for life of operation	Decommissioning
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil	Low-Medium	Certain for life of operation	Life of Operation
	Construction of internal Roads	Low-Medium	Certain for life of operation	Life of Operation
	Building activities Noise increase at the boundary of the mine footprint.	Low-Medium	Certain for life of operation	Life of Operation
	Hauling of building material to and from the specific areas.	Low-Medium	Certain for life of operation	Life of Operation

	Construction of the Mine Residue dump, soil stock pile and material stock pile. Noise increase at the boundary of the mine footprint.	Low-Medium	Certain for life of operation	Life of Operation
	Clearing of new open cast mining areas, stripping and stockpiling of topsoil. Noise increase at the boundary of the mine footprint.	Low-Medium	Certain for life of operation	Life of Operation
	Diesel generators Noise increase at the boundary of the mine footprint.	Low-Medium	Certain for life of operation	Life of Operation
	Additional traffic to and from the mine	Low-Medium	Certain for life of operation	Life of Operation
	Mining activities	Low-Medium	Certain for life of operation	Life of Operation
	Maintenance activities at the site.	Low-Medium	Certain for life of operation	Life of Operation
	Back fill of mine footprint area	Low-Medium	Certain for life of operation	Life of Operation
	Planting of grass and vegetation at the rehabilitated areas	Low-Medium	Certain for life of operation	Life of Operation
	Removal of infra-structure	Low-Medium	Possible	Life of Operation
Visual impacts	Potential visual impact	Medium	Certain for life of operation	Life of Operation
	Potential Visual Impact on the surrounding land users/ residents	Medium Regional	Certain for life of operation	Decommissioning

	Potential visual impact of the proposed development on the construction phase of the surrounding land users in close proximity	Medium Regional	Certain for life of operation	Decommissioning
	Potential visual impact of the proposed development on the operational phase of the surrounding land users in close proximity.	Medium Regional	Certain for life of operation	Decommissioning
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Certain for life of operation	Decommissioning
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Probable	Decommissioning
	Safety and Security Risks	Low Negative	Highly Probable	Decommissioning
	Health Impacts	Low Negative	Highly probable	Decommissioning
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the mining company.	Low to medium	Life of operation	Decommissioning

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

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

Nature of impact
This is an appraisal of the type of effect the activity would have on the affected environmental component. Its description should include what is being affected, and how.

Extent
The physical and spatial size of the impact. This is classified as follows:

- **Local**
  The impacted area extends only as far as the activity, e.g. a footprint.
- **Site**
  The impact could affect the whole, or a measurable portion of the property.
- **Regional**
  The impact could affect the area including the neighbouring farms, transport routes and the adjoining towns.

Duration
The lifetime of the impact which is measured in the context of the lifetime of the proposed phase (i.e. construction or operation).

- **Immediate**
  Activity specific/ No effect /Controlled (Non harmful)
- **Short term (Construction)**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term (Life of Operation)**
  The impact will last up to the end of the mining period, where after it will be entirely negated.
- **High (Long term to Decommissioning)**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Very High (Residual National severe environmental damage)**

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

Intensity
This describes how destructive, or benign, the impact is. Does it destroy the impacted environment, alter its functioning, or slightly alter it. These are rated as:

- **Low**
  This alters the affected environment in such a way that the natural processes or functions are not affected.
- **Medium**

The affected environment is altered, but function and process continue, albeit in a modified way.

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

  This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

Probability

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

- **Improbable**
  The possibility of the impact occurring is very low, due either to the circumstances, design or experience.
- **Probable**
  There is a possibility that the impact will occur to the extent that provisions must be made therefore.
- **Highly probable**
  It is most likely that the impacts will occur at some or other stage of the development.
- **Definite**
  The impact will take place regardless of any preventative plans, and mitigation measures or contingency plans will have to be implemented to contain the impact.

Determination of significance

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:

- **No significance**
  The impact is not likely to be substantial and does not require any mitigatory action.
- **Low**
  The impact is of little importance, but may require limited mitigation.
- **Medium**
  The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.
- **High**
  The impact is of great importance. Failure to mitigate, with the objective to reduce the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable. Mitigation is therefore essential.

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

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

During the operational stages of the mining operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and stockpiles/dumps will alter the topography by adding features to the landscape. Topsoil removal and pit will unearth the natural topography. The construction of infrastructure and various facilities in the mining area can also result in loss of soil due to erosion. Vegetation will be stripped in preparation for placement of infrastructure and pit, and therefore the areas will be bare and susceptible to erosion.

The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The cleared areas will be rehabilitated, but full restoration of soils might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

There is also a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil useless unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. Most of the site has a land capability for grazing, but grazing activities can still be performed in areas not earmarked for the operation, and with proper rehabilitation the land capabilities and land use potential can be restored.

Groundwater could be directly affected if any oil and fuel spillages occur during these scenarions and activities. Similarly, hazardous surface spillages will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources (drainage lines) during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow. If no, or inadequate ablution facilities are available then workers might feel the need to use the veld for this purpose, which can contaminate natural resources.

Any pit within the drainage lines will impact on the surface water environment by altering their physical characteristics. These impacts include the alteration of flow

patterns, ponding and an increase in the concentration of suspended solids and sedimentation.

Mining activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitate following disturbance events. It is likely that the pristine vegetation and any protected species will be destroyed during the operation. While general clearing of the area and mining activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the mining site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

The transformation of natural habitats to mining and associated infrastructure will result in the loss of habitat affected individual species, and ecological processes. In turn this will result in the displacement of faunal species dependent upon such habitat. Increased noise and vibration due to operational activities will disturb and possibly displace birds and other wildlife. Fast moving vehicles take a heavy toll in the form of road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. Associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population"s genetic make-up. This results in a subsequent loss of genetic variability between meta-populations occurring within the study site. Pockets of fragmented natural habitats hinder the growth and development of populations.

During the operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The operation will typically have low to moderate levels of noise, along with man-influenced sounds such as traffic on the secondary road, activities on the farm and very occasional air traffic. The proposed operation will add a certain amount of noise to the existing noise in the area. However, levels of noise generated by mining activities especially with blashing can be substantial.

The impact of site generated trips on the traffic and infrastructure of the existing roads is expected to be moderate. Furthermore, if road safety is not administered it can have a high impact on the safety of fellow road users.

The activities on site have the potential to impact upon heritage resources. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon these resources will be permanent and irreversible. Any movement of vehicles, equipment or personnel through areas containing these artefacts could result in the permanent destruction of the artefacts and loss of heritage resources.
The operation will create a number of new employment opportunities and uplift the local community. The magnitude of this impact will depend on the number of

people that will be employed and the number of contractors sourced. An influx of people into the area could possibly impact on safety and security of local farm residents. During the decommissioning and at closure of the site, staff will most likely be retrenched, resulting in people being unable to find new employment for a long period of time.

Economic slump of the local towns after site closure is not considered to be an associated potential impact, because there are numerous other mining operations in the region. However, income streams from wage bills as well as goods and services contracts (at all geographical levels) will come to an end, reducing the monetary income of individuals and operation-related businesses.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the site, and that the economy will not decline to its original level prior to the development of this project. This is because the operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

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

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

Impact	Mitigation	Risk
Air quality	• Speed limits; • Spraying of surfaces with water; • Avoidance of unnecessary removal of vegetation; • Re-vegetation; • Monitoring; • Backfilling and rehabilitation of disturbed areas; and • Controlled drilling and blasting operations, preferably on wind-free days.	Low
Fauna	• Mining activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. • The extent of the mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors.	Medium

	• Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. • All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species such as snakes, tortoises and owls which are often persecuted out of superstition. • All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. • The environmental induction should occur in the appropriate launguages for the workers who may require translation. • Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. • In the case of any mortalities resulting from birds flying into power lines, these should be recorded including the date of the observation and the species affected and any other relevant information. • Employ measures that ensure adherence to the speed limit. • Careful considereation is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of pristine habitats and minimise the overall mining footprint. • The Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining; • Low angle access ramp in pit; • Snares & traps removed and destroyed; and • Maintenance of firebreaks.	
Flora	• Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining; • It is recommended that these plants are identified and marked prior to mining. • These plants should where possible, be incorporated into the design layout and left in situ. • However if threatened of destruction by mining these plants should be removed (with	Medium

	the relevant permits from DAFF and DENC) and relocated if possible. • A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation. • All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. • Minimise the footprint of transformation • Encourage proper rehabilitation of mined areas • Encourage the growth of natural plant species (diverse selection of natural plant species). • Mechanical methods (hand-pulling) of control to be implemented extensively. • Annual follow-up operations to be implemented. • Ensure measures for the adherence to speed limit. • Maintenance of firebreaks; • No trees felled for firewood;	
Ground water	• Refuelling must take place in well demarcated areas and over suitable drip trays to prevent ground water pollution. • Spill kits to clean up accidental spills from earthmoving machinery must be well marked and available on site. • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. • All facilities where dangerous materials are stored must be contained in a bund wall. • Vehicles and machinery should be regularly serviced and maintained. • Monitoring of groundwater abstraction and quality; and • Clean & Dirty water system must be well maintained. • Provide for establishing a monitoring program to detect groundwater response to seasonal variations and pit dewatering as well as possible potential contamination of groundwater.	Low
Noise	• Hearing protection; • Non-metallic washers to join infrastructure; • Working hours;	Medium

	• Controlled drilling & blasting operations; • Silencers on equipment and vehicles; • Acoustic enclosure for generators; and • Distance from residence of Occupant.	
Soil	• At no point may plant cover be removed within the no-development zones; • All attemps must be made to avoid exposure of dispersive soils; • Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased; • Ground exposure should be minimized in terms of the surface area and duration, wherever possible; • The mining operation must co-ordinate different activities in order to optimise the utilisation of the excavated pit; • Construction that requires the clearing of large areas of vegetation and excavation should ideally occur during the dry season only; • Construction during the rainy season (November to March) should be closely monitored and controlled; • The run-off from the exposed ground should be controlled with the careful placement of flow retarding barriers; • The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion; • All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) ihn order to avoid excessive erosional induced losses; • Excavated and stockpiled soil material are to be stored and bermed on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate; • Stockpiles susceptible to wind erosion are to be covered during windy periods; • Audits must be carried out at regular intervals to identify areas where erosion is occurring; • Appropriate remdial action, including the rehabilitation of eroded areas, must occur; • Rehabilitation of the erosion channels and gullies; • The mining operation should avoid land with steep slopes;	Medium

	• Dust suppression should take place, without compromising the sensitive water balance of the area; • Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion; • Topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions; • Topsoil must be stockpiled for the shortest possible timeframes in order to ensure that the quality of the topsoil is not impaired; • Topsoil must not be handled when the moisture content exceeds 12%; • Topsoil stockpiles must be kept separate from sub-soils; • The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil; • Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution; • Spill kits to clean up accidental spills from earthmoving machinery must be well marked and available on site; • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures; • All facilities where dangerous materials are stored must be contained in a bund wall; • Vehicles and machinery should be regularly serviced and maintained.	
Surface water	• Refuelling must take place in well demarcated areas and over suitable drip trays to prevent surface water pollution; • Spill kits to clean up accidental spills from earthmoving machinery must be well marked and available on site; • Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures; • All facilities where dangerous materials are stored must be contained in a bund wall; • Vehicles and machinery should be regularly serviced and maintained; • Storm water control; • Clean & dirty water plan.	Medium

Topography	• Backfill the pit continuously if possible, otherwise when space becomes available; • Employ effective rehabilitation strategies to restore surface topography of the pit and plant site; • Stabilise the mine residue deposits; • All temporary infrastructure should be demolished during closure.	Medium
Visual	• Continuous backfilling of open pit if possible, otherwise when space become available; • Replacing layer of topsoil over backfilled areas; • Sloping of rehabilitated and disturbed areas; • Sloping of topsoil dumps, stockpiles and waste rock dumps; and • Removal of all infrastructure upon mine closure.	Low-Medium

(ix) The outcome of the site selection Matrix:- Final site layout plan:

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties.)

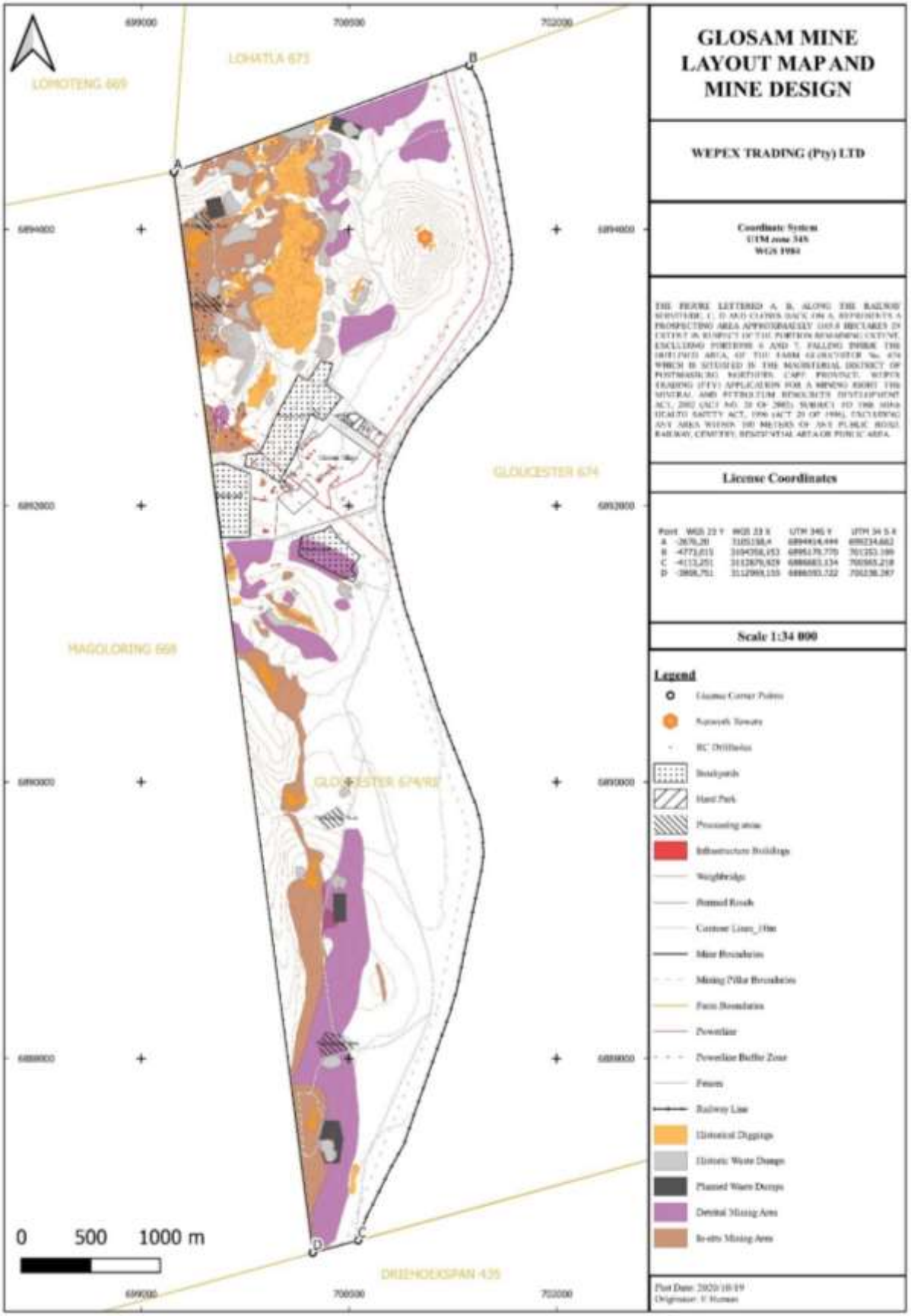

Figure 27. Conceptual site layout plan.

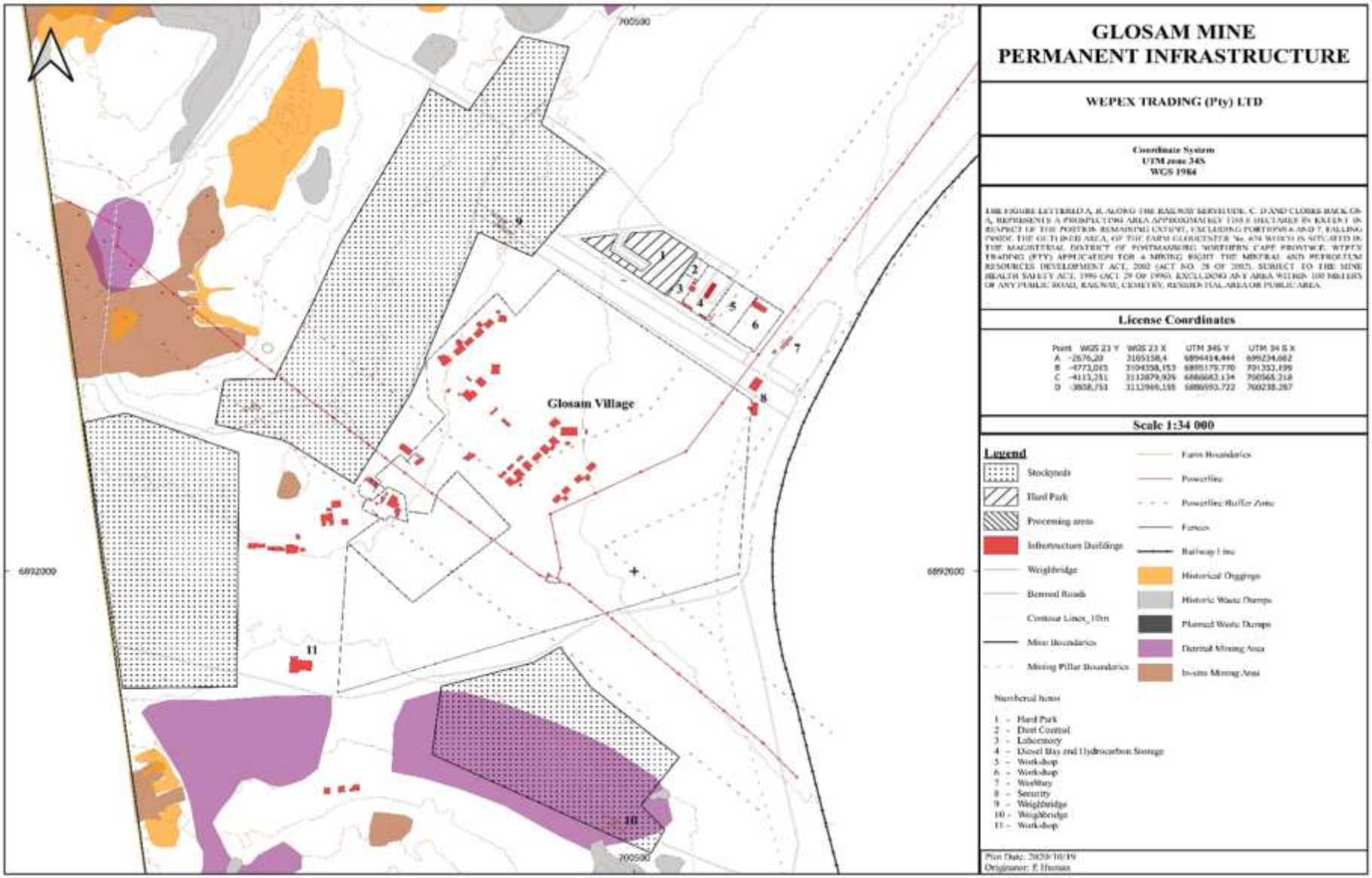

Figure 28. Mine design

(x) Motivation where no alternative sites were considered:

No viable alternative sites were identified for the following reasons:

- Wepex Trading (Pty) Ltd holds a valid Prospecting Right over the application area with a Mining Right application in process.
- A drilling programme and bulk sampling was conducted on the abovementioned property under the Prospecting Right, which results proved the feasibility of the project.
- The drilling results and bulk sampling findings indicates that manganese ore within the boundaries of the abovementioned property can be viably mined.
- The final locality of the above infrastructure was decided upon after taking into account of the following:-
  - Locality of the ore bodies;
  - Topography of the area; and
  - Environmental features;

(xi) Statement motivating the preferred site:
(Provide a statement motivating the final site layout that is proposed.)

Glosam is characterised by a fairly complex mining history. Various formal and informal mining companies have mined the area for iron ore and manganese between the late 1920s and 1984. This produced numerous open pits scattered across the site. These pits and associated road networks are still visible today as well as various building and structures related to the past mining activities; some of which are of archaeological significance.

Exploration activities have also been performed over the past decade.The site was firstly determined by Wepex Trading with an existing Prospecting Right under renewal over the property. The final site layout was determined by taking into account all positive and negative environmental impacts, inputs from the surface owner and all operational requirements.

i) Plan of study for the Environmental Impact Assessment process:

(i) Description of alternatives to be considered including the option of not going ahead with the activity:

- Land use development alternatives:
  The site layout may vary, depending on the operational requirements. However the final design and layout of the infrastructure have been planned and decided upon by the engineering company appointed by the mine and in consultation with the mining right applicant on the grounds of reserves, and placement of infrastructure based on hauling distance, environmental features such as wind direction, heritage findings, protected species, and stormwater management on the mine.

- No-go option:
  The following positive impacts will be lost if the proposed mining project is not developed:
  - TAX and VAT obligations to SARS as well as Royalties;
  - CAPEX spent locally and regionally;

- Employment opportunities;
- Payroll income;
- Operating expenditure and maintenance (OPEX);
- Revenue.

(ii) Description of the aspects to be assessed as part of the environmental impact assessment process:

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, loading, hauling and transport, and mining activities such as excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)

1. The clearing of vegetation for:
- Access roads and haul roads
- Surface infrastructure
- Explosive Magazine
- Product Stockpile area
- Waste disposal site (domestic and industrial waste)

2. The stripping and stockpiling of topsoil.

3. Opencast mining for manganese ore and iron ore.
- Blasting, loading, hauling.

4. Altering the characteristics of surface water features.

5. The development of temporary stockpiles:
- Topsoil storage area;
- Overburden;
- Ore Stockpile dumps;
- Subgrade stockpile area.

6. The backfilling of open pit.

7. The construction of plant.

8. Loading, hauling and transporting of ROM, product and material

9. Water holding facilities, pipeline and stormwater control:
- Clean & Dirty water system: Stormwater;
- Water distribution Pipeline;
- Water tank.

10. Fuel storage and refuelling bays;
- Re-fuel and lube station;
- Fuel Storage facility (Diesel tanks);
- Concrete bund walls and diesel depots.

11. Supporting infrastructure:
- Office complexes;
- Office Parking Bay;

- Workshop and Wash bay;
- Salvage yard (Storage and laydown area);
- Ablution facilities/ Sewage facilities;
- Generators;
- Security Gate and guard house at access control point;
- Pipelines transporting water;
- Storage facility : Drill Cores;
- Weighbridge;
- Weighbridge control room: – Mobile container.

(iii) Description of aspects to be assessed by specialists:

Most specialist studies are needed in order to investigate the potential environmental impacts associated with the mining activities, while other more technical specialists are needed to provide strategies and technical specifications for infrastructure that could potentially alleviate impact on the environment. Terms of reference for each of these studies are unique but include the identification and delineation of respective environmental attributes, assessing the state of these attributes, identifying potential impacts relating to these attributes and making recommendations regarding mitigation measures and legal requirements. The following specialists studies will be completed:

- Air quality;
- Archaeology, cultural & heritage;
- Ecological which will include Fauna, Flora, soil and surface water;
- Hydrology Impact Assessment, Surface and Groundwater Studie
- Noise & Vibration;

(iv) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the mining activities include impacts on air quality, noise, fauna, flora, ground

water, terrestrial ecology, heritage resources, socio-economy, aquatic environments, visuals, storm water and erosion.

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable mining, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, mining method and proceeding without the mining operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the mining operation will however not form part of this consideration, as the location of the mining site is determined by the geological location of the mineral resource.

(v) The proposed method of assessing duration significance:

The lifetime of the impact will be measured in the context of the lifetime of the proposed phase or activity.

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.

- **Medium term**
  The impact will last up to the end of the mining period, where after it will be entirely negated.

- **Long term**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.

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

(vi) The stages at which the Competent Authority will be consulted:

Consultation with the Competent Authority will take place throughout the application process, however more specifically; consultation will take place before submission of the Scoping Report and again before submission of the EIA/EMPR Report.

Thus the timeframes (as mentioned in the Department of Mineral Resources' form for Environmental Authorisations) should be aligned with the National Environmental Management Act 1998 as amended as well as with the prescribed timeframes for the submission of documents as regulated by the National Environmental Management Act's EIA (Environmental Impact Assessment) Regulations (2014 as amended) and it should be strictly adhered thereto.

(vii) Particulars of the public participation process with regard to the Impact Assessment process that will conducted:

1. **Steps to be taken to notify interested and affected parties:**
(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h)(ii) herein.)

The consultation process as described by NEMA for Environmental Authorisation was followed and is still in process. The following steps were already taken:

Identified interested and/or affected parties were notified of the application and acceptance of the application;

- Notification letters were sent to all identified interested and / or affected parties on the 26 of November 2020. Attached to each of these letters was a Background Information Document, containing information relating to the proposed mining project application and the Environmental Authorisation.
- A newspaper advert was placed in the Kathu Gazette on 6 March 2021 which is the local newspaper in the project area.

Consultation process:

- An advert will be placed for a public meeting when the draft EIA EMP stage has been reached and the need arise, also for the SLP document.

Registered interested and/or affected parties shall be notified of the EIA process as follows:

- Notification letters; and
- Newspapers adverts in local newspapers.

2. **Details of the engagement process to be followed:**
(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and record of such consultation will be required in the EIA at a later stage.)

The following procedures will be followed:

- If necessary and required public meetings will be held with registered IAPs at suitable venues and on appropriate dates, depending on the feedback received during the consultation process.
- An IAP register will be compiled and regular and ongoing follow-up sessions will be held with the IAPs to monitor those issues raised during the IAP process and that are deemed to be affected by the mining operation.
- BID documents will be sent to all registered IAPs and other documentation (Scoping, EMP and EMPR) will be made available in public libraries.
- Records will be kept of the complaints and the mitigation measures implemented.

3. Description of the information to be provided to Interested and Affected Parties:

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

The following information will be provided to IAPs:

- The site plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised;
- The duration of the activity.

The following information will be requested from the IAPs:

- To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions;
- To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity;
- To provide information on current land uses and their location within the area under consideration;
- To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied. They will be requested to make written proposals;
- To mitigate the potential impacts on their socio economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

(viii) Description of the tasks that will be undertaken during the environmental impact assessment process:

Determining environmental attributes

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and

historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

Identification of impacts and risks

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process.

Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the mining activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy, aquatic environments, visuals, stormwater and erosion.

Consideration of alternatives

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the mining project. In order to ensure that the proposed project enables sustainable mining, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, mining method and proceeding without the mining operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility.

Alternatives for the locality of the mining operation will however not form part of this consideration, as the location of the mining site is determined by the geological location of the mineral resource.

Process to assess and rank impacts

Before any assessment can made the following evaluation criteria need to be described.

Table 8: Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
0	Very Low	<20% sure of particular fact or likelihood of impact occurring
1	Low	20 – 39% sure of particular fact or likelihood of impact occurring
2	Moderate	40 – 59% sure of particular fact or likelihood of impact occurring
3	High	60 – 79% sure of particular fact or likelihood of impact occurring
4	Very High	80 – 99% sure of particular fact or likelihood of impact occurring

5	Definite	100% sure of particular fact or likelihood of impact occurring

Table 9: Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
0	Site Specific Activity specific/ no effect / Controlled	Direct and Indirect impacts limited to site of impact only
1	On-site	Direct and Indirect impacts affecting environmental elements within 2 km of site
2	Immediate surroundings /Local Municipality/outside mine fence	Direct and Indirect impacts affecting environmental elements within the Postmasburg area
3	Regional effect /District	Direct and Indirect impacts affecting environmental elements within District (ZF Mgcawu District)
4	National /severe environmental damage	Direct and Indirect impacts affecting environmental elements in the Northern Cape Province
5	Trans boundary effects	Direct and indirect impacts affecting several Provinces

Table 10: Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
0	Very Short (Immediate)	Less than 0-6 months
1	Short (Construction)	6 months to 1 years
2	Medium (Life of Operation)	Life of Operation
3	Decommissioning	Regional Effect
4	Residual	Catastrophic / Major
5	Permanent	Disastrous

Table 11: Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
0	No Impact Insignificant /Non harmful	There will be no impact at all – not even a very low impact on the system or any of its parts.
1	Very Low Minimal Potentially harmful	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
2	Medium/slightly harmful	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
3	High Critical Serious	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
4	Catastrophic / Major	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult,

		expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
5	Disastrous Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 12.

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Very High - Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

(ix) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored:

ACTIVITY Whether listed or not listed (e.g. excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water suppy dams and boreholes, accommodation, offices, ablution, stores, workshops, processing lant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc…)	**POTENTIAL IMPACT** (e.g. dust, noise, drainage, surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc…etc…)	**MITIGATION TYPE** modify, remedy, control or stop (e.g. noise control measures, stormwater control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity etc…etc…) (e.g. modify through alternative method. Control through management and monitoring through rehabilitation.)	**POTENTIAL FOR RESIDUAL RISK**
Blasting	• Dust • Fly-rock • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance • Surface water contamination	• Dust control and monitoring • Noise control and monitoring • Access control. • Continuous rehabilitation. • Stormwater run-off control.	Medium
Sewage facilities	• Soil contamination • Groundwater contamination • Odours	• Maintenance of sewage treatment facility on regular basis. • Removal of containers upon closure.	Very low
Clean & Dirty water system	• Surface disturbance • Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of berms. • Groundwater levels and quality monitoring. • Oil traps used in relevant areas. • Drip trays used. • Immediately clean hydrocarbon spill.	Low
Diesel tanks • Re-fuel and lube station	• Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Maintenance of diesel tanks and bund walls. • Oil traps. • Groundwater quality monitoring. • Drip tray at re-fuelling point. • Immediately clean hydrocarbon spill.	Medium

Excavation (Pit)	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Continuous rehabilitation • Stormwater run-off control • Immediately clean hydrocarbon spill • Drip trays • Rock stability control and monitoring • Erosion control	Medium
Explosives magazine	• Groundwater contamination • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Access control • Maintenance of magazines and fence. • Groundwater quality monitoring • Stormwater run-off control • Immediately clean spill	Very low
Generators ((8X 30-100 KW)	• Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of generator and bund walls • Noise control and monitoring • Oil traps • Groundwater quality monitoring • Immediately clean hydrocarbon spill	Medium
Office – 50m² Bricks, concrete, doors, windows or pre-fabricated office blocks on concrete	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Very low
Parking bay	• Dust • Groundwater contamination • Noise	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring	Low

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Crushing and Screening plant	• Dust • Noise • Groundwater contamination and usage • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Access control • Maintenance of crushing and screening plant • Dust control and monitoring • Groundwater quality and level monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Medium
Water distribution Pipeline	• Surface disturbance • Groundwater contamination • Soil contamination • Surface water contamination	• Maintenance of pipes. • Groundwater levels, quality and quantity monitoring.	Low
Roads	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Maintenance of roads • Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Speed limits • Stormwater run-off control. • Erosion control • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Salvage yard	• Groundwater contamination	• Access control • Maintenance of fence.	Low

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance • Surface water contamination	• Groundwater quality monitoring • Stormwater run-off control • Immediately clean hydrocarbon spill	
Security Gate and guard house at access control point	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Access control • Maintenance of boom gates and container. • Dust control and monitoring • Noise control and monitoring • Groundwater quality monitoring • Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Stockpile area	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control. • Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	Low
Storage facility : Drill Cores	• Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination • Surface disturbance	• Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Very low
Subgrade stockpile area	• Dust • Groundwater contamination • Noise	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Drip trays • Stormwater run-off control.	Low

	• Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Immediately clean hydrocarbon spills • Rip disturbed areas to allow re-growth of vegetation cover	
Topsoil storage area	• Dust • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil disturbance • Surface disturbance	• Dust control and monitoring • Stormwater run-off control. • Continuous rehabilitation • Rip disturbed areas to allow re-growth of vegetation cover • Backfilling of topsoil during rehabilitation	Low
Waste disposal site	• Groundwater contamination • Surface water contamination	• Storage of waste within receptacles • Storage of hazardous waste on concrete floor with bund wall • Removal of waste on regular intervals.	Low
Waste rock dumps	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Dust control and monitoring • Groundwater quality monitoring • Noise control and monitoring • Stormwater run-off control. • Rip disturbed areas to allow re-growth of vegetation cover	Low
Washbay	• Groundwater contamination and usage • Removal and disturbance of vegetation cover and natural habitat of fauna • Soil contamination	• Groundwater quality and level monitoring • Concrete floor with oil/water separator • Stormwater run-off control • Immediately clean hydrocarbon spills	Low
Water tank: It is anticipated that the operation will establish a minimum of 8 x 10 000 litre	• Groundwater abstraction and usage • Surface disturbance	• Monitor water quality and quantity • Maintenance of tanks (check for leaks). • Groundwater levels and quality monitoring.	Low

water tanks with purifiers for potable water.			
Water tank	• Groundwater abstraction and usage • Surface disturbance	• Maintain water tanks and structures. • Groundwater levels and quality monitoring.	Low
Weighbridge	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Access control • Maintenance of weighbridge • Dust control and monitoring • Noise control and monitoring • Groundwater quality monitoring • Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Weighbridge control room – mobile container	• Dust • Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Access control • Maintenance of weighbridge control room • Dust control and monitoring • Noise control and monitoring • Groundwater quality monitoring • Immediately clean hydrocarbon spill • Rip disturbed areas to allow re-growth of vegetation cover	Low
Workshop and Wash bay	• Groundwater contamination • Noise • Removal and disturbance of vegetation cover and natural habitat of fauna • Surface disturbance	• Access control • Concrete floor with oil/water separator • Maintenance of buildings • Noise control and monitoring • Groundwater quality monitoring • Immediately clean hydrocarbon spill	Low

(x) Other information required by the Competent Authority:

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

a. 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 parson including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix '7' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.

The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the local farm residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.
- The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

- Impact on landowner and occupier:
  Positive: Compensation of land lost to mining.
  Negative: Temporary Loss of grazing land that will re-establish post mining with the correct mitigation measures put in place by Wepex Trading.

b. Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act:
(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in Section 3(2) of the National Heritage Resources Act, 1999 (Act 25 of 1999) with the exception of the national estate contemplated in Section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix '8' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

Prof. AC van Vollenhoven from Archaaetonos Culture en Cultural Resources Consultants were appointed by Wepex Trading (Pty) Ltd to provide an Cultural Heritage Impact assessment study in order to highlight the cultural characteristics of the proposed mining area and to determine the possible impact of mining on the cultural status of the application area. (The study is attached as Appendix 5)

Findings: During the survey twenty-one sites of cultural heritage significance were identified within the immediate project area. Recommendations:

- Site 12 (farm yard) and 15 and 20 (railway sidings) are all outside of the development boundary. Site 12 has no cultural heritage value and this report is seen as ample mitigation. The structures are younger than 60 years. It needed, may be demolished without a permit from SAHRA.
- The railway sidings receive a field rating of Local Grade IIIC. The description in the phase 1 heritage report is seen as sufficient recording and it may be granted destruction if needed.
- The remains of industrial building (site 6), the base of a water reservoir (site 9), the office complex remains (site 10), various remains of brick buildings (site 11) and the farm yard (site 18) has no cultural heritage value. This report is seen as ample mitigation. The structures are younger than 60 years and in a very poor condition. It may be demolished without a permit from SAHRA. .
- The foundation (site 5), concrete building remains (site 16) and metal framework of an industrial building (site 21) has no cultural heritage value and may therefore be demolished. Since it is older than 60 years, a permit would be required from the SAHRA.
- For the three mine houses (site 4) the field rating of the site is Local Grade IIIC. The description in this phase 1 heritage report is seen as sufficient recording and it may be granted destruction at the discretion of the relevant heritage authority without a formal permit application, subjected to the granting of Environmental Authorisation. The mine does not currently have any plans that will impact here. Also, since the buildings are younger than 60 years, no permit is currently required.
- The old hostel area and recreation hall (site 2) is regarding as having a field rating of Local Grade IIIC. The description in this phase 1 heritage report is seen as sufficient recording and it may be granted destruction. As both structures are younger than 60 years, no permit from SAHRA is needed.
- The field rating for the ore loading bays (site 7, 14 and 19) Local Grade IIIC. The description in the phase 1 heritage report is seen as sufficient recording and it may be granted destruction. Since these sites are all younger than 60 years and in a very poor condition, it may be demolished without a permit from SAHRA.
- The field rating of the Glosam Mine Village (site 3) is Local Grade IIIB. The site should be included in the heritage register and may be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority.
- The village is older than 60 years and is regarded as being very unique and typical of such a mining village. Therefore at least the first sixteen houses, social area, hall and other structure within the inner circle of the village should be preserved. It may however be utilized for another purpose, being a youth camp, holiday resort or guest house. It would be good to also

preserve the outer circle as it is part of the original lay-out plan, although most of the buildings are much younger.

- The mine does not intend to do any work here at present. If needed, for any changes to the buildings older than 60 years, a permit would be required from the SAHRA.
- The Miners boxes (sites 1, 13 and 17) are regarded as having a field rating of Local Grade IIIB. The sites should be included in the heritage register and may 5 be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority.
- In this case, site 1 should be kept intact and preserved, meaning that a management plan should be drafted for the site. It should also be fenced in.
- Sites number 13 and 17 may be demolished, but only after complete documentation thereof and only if site number 1 remains intact. This documentation includes doing test excavations and drawing a site map.
- The loading platform (site 8) has a field rating of Local Grade IIIB. The site should be included in the heritage register and may be mitigated. Mitigation is subject to a permit application lodged with the relevant heritage authority. As it is typical of a certain era in the mining industry, it should be preserved, perhaps as part of an interpretive route. It may be utilized in further mining activities, but a management plan would be needed for that.
- The proposed development may continue, but only after receiving the necessary approval from SAHRA.
- It should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Due to the density of vegetation it also is possible that some sites may only become known later on. Operating controls and monitoring should therefore be aimed at the possible unearthing of such features. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.

- **In This regards the following 'Chance find Procedure' should be followed:**

1. Upon finding any archaeological or historical material all work at the affected area must cease.
2. The area should be demarcated in order to prevent any further work there until an investigation has been completed.
3. An archaeologist should be contacted immediately to provide advice on the matter.
4. Should it be a minor issue, the archaeologist will decide on future action, which could include adapting the HIA or not. Depending on the nature of the find, it may include a site visit.
5. SAHRA's APM Unit may also be notified.
6. If needed, the necessary permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist.

7. The removal of such archaeological material will be done by the archaeologist in lieu of the approval given by SAHRA, including any conditions stipulated by the latter.
8. Work on site will only continue after removal of the archaeological/ historical material was done.

Palaeontology

Prof. Marion Bamford (Palaeobotanist) from archaeological & Heritage Services Africa (Pty) Ltd Consultants were appointed by Wepex Trading (Pty) Ltd to provide an palaeontological Impact assessment study in order to highlight the plaeontological characteristics of the proposed mining area and to determine the possible impact of mining on the cultural status of the application area. (The study is attached as Appendix 6).

Executive Summary

A palaeontological Impact Assessment was requested for the prospecting rights applications for Glosam Mine, approximately 20 km north of Postmasburg, Northern Cape Province. To comply with the South African Heritage Resources Agency (SAHRA) in terms of Section 38(8) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA), a desktop Palaeontological Impact Assessment (PIA) was completed for the application.

The proposed site lies on the dolomites of the Reivilo Formation (Campbell Rand Subgroup, Ghaap Group, Transvaal Supergroup) that is composed of giant stromatolites in some areas.

Since there is a very small chance of fining fossil algal cells in the traces fossils, i.e. stromatolites, a Fossil Chance Find Protocol should be added to the EMPr.

Based on this information it is recommended that no palaeontological site visit is required unless the geologist, environmental office or responsible person finds fossils, sends photographs to a palaeontologist to be assessed and the palaeontologists recommends collection, with a valid SAHRA permit. It is the opinion of the palaeontolotogist that the prospecting right be granted.

(xi) Other matters required in terms of Sections 24(4)(a) and (b) of the Act:

(The EAP managing the application must provide the Competent Authority with details, written proof of an investigation as required by Section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix '9'.)

There are no viable alternatives as Wepex Trading has a Prospecting right over the property and over which the resources has been proven through drilling and bulk sampling activities.

As mentioned before, the specific occurrence of manganese in the area dictates the selection of the specific mining site and there are no alternatives in terms of project location.

The mining operation will provide ±150 - 200 jobs and will also add to the increased economic activity in the area and surrounding farms.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR area adhered to e.g. rehabilitation.

(xii) Undertaking regarding correctness of information:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

_____

Signature of EAP

Date: 25 March 2021

(xiii) Undertaking regarding level of agreement:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

_____

Signature of EAP

Date: 25 March 2021

- END –

APPENDIX 1

CURRICULUM VITAE

Roelina Henriette Oosthuizen

Cell: 084 208 9088

E-Mail: roosthuizen950@gmail.com

1. PERSONAL INFORMATION

Name: Roelina Henriette Oosthuizen

Surname: Oosthuizen (Maiden: Alberts)

Identity number: 7004180037082

Date of birth: 18 April 1970

Gender: Female

Marital status: Married (26 years) with 3 children

Driving license: Yes, Code EB

Languages: Fluent in Afrikaans and English

Nationality: South African

Criminal offences: None

Health: Excellent, fit

2. SYNOPSIS OF PROFESSIONAL CAREER

Roelina Henriette Oosthuizen has 22 years of experience in the environmental management field. She started her career in the area of Environmental Management and Environmental Impact Assessment (EIA) evaluation in 1997 at the Department of Minerals and Energy. After moving to industry in 2005, Roelien became involved in the practical aspects of environmental management. A major project during her early years outside of government was that of the EIA for a Game Reserve and Lodge development near Barkly-Wes, she did this project together with a consultancy firm from Kimberley AWS water solutions (Mr. Adriaan du Toit). In 2007 the Company she worked for was bought by a Canadian Group of Companies and she became more involved in practical aspects of the operations and worked closely with operations personnel in dealing with ongoing management of environmental impacts at the Mine (e.g. monitoring, auditing, operating procedures). She was also centrally involved in liaison with the authorities and with stakeholders in neighbouring areas.

During her time at the Canadian Group of Companies, Roelien was the environmental manager overseeing operations in the Barkly-West, Prieska and Douglas areas. She was responsible for preparing the environmental compliance documents for each operation which included Performance Assessments (Audit reports) and Financial Quantum submissions as well as new applications for Prospecting Rights and Mining Rights with the relevant Scoping, EIA / EMP documents. Her activities included liaison with stakeholders and also with the relevant Departments. During this time, Roelien became increasingly involved in environmental policy and strategy work, as well as the environmental aspects of corporate governance.

She has assisted a range of clients with Environmental Due Diligence audits and compliance audits. Roelien has also undertaken numerous environmental audits, particularly compliance and due diligence audits for clients in the mining industry. Thus, she is familiar with best practice standards in environmental auditing.

Roelien have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

In a nutshell, Roelien has wide ranging experience and is thus well-positioned to assist clients in any matter related to sustainability and environmental management. This is achieved through her own skills base and on drawing on specialists.

3. QUALIFICATIONS

MEM (Master in Environmental Management) University of the Orange Free State (2000)
B – Comm NWU (1991)

4. TRAINING COURSES

Roelien have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st EnviroMining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual EnviroMining Conference
March 2015	5th Annual EnviroMining Conference
February 2018	Seminar by the Department of Environmental Affairs on knowledge sharing workshops on the Screening Tool
August 2020	**SAHRA Workshop for EAP's and Heritage Practitioners**
October 2020	**IAIAsa Simposium**

5. PROFESSIONAL REGISTRATION

Registered Environmental Assessment Practitioner (EAP) Number 2019/1467 with EAPASA. Registered as a professional at IAIAsa (International Association for Impact Assessment South Africa). IAIAsa is a voluntary organisation and is not a statutory body regulating the profession. Its members are however expected to abide by the organisations code of ethics.

6. PROFESSIONAL EXPERIENCE

Projects are listed below by area of expertise.

Environmental Management Systems (EMS) and Environmental Auditing

Development of EMS and Compilation of INCIDENT REPORT AND INVESTIGATION FORMS for the EMS of the Canadian group of Companies on various sites.

Undertaking of a range of due diligence and performance audits for operations, including those listed below:

Performance Assessment reports for a mining company with various infrastructure and mining operations near Barkly-West and Windsorton.

Performance Assessment reports for a mining company near Douglas.

Preparation of an environmental auditing checklist / protocol for a Community project with restitution ground in assisting the community to determine environmental legal compliance at their operations.

Environmental audit as part of a closure with Dr. Betsie Milne another specialist. This Annual Rehabilitation Plan has been developed to match the various requirements set out in the National Environmental Management Act (No 107 of 1998) (NEMA) Regulations pertaining to the financial provision for prospecting, exploration, mining or production operations (as amended in 2015).This project had the objective of ensuring that this company are accounting for environmental liabilities and risks adequately. The plan distinguishes between (a) those environmental rehabilitation liabilities pertaining to drilling, for which the Company was legally responsible and (b) those environmental rehabilitation liabilities pertaining to historic mining activities, for which the Company is not legally responsible, but consider performing as part of their best practice environmental principals. Three costing scenarios were explored in order to evaluate the most feasible rehabilitation plan, i.e. (1) Total cost (worst-case scenario) including risks, (2) legally required cost and (3) features currently available that do not involve any risks.

Sustainability projects: policies, guidelines, strategies and performance reporting

Involved in the compilation of 43-101 technical documents for listed companies which included information on sustainability and performance in rehabilitation and sustainable mining.

Alien species eradication project guideline and strategy near Barkly-Wes in terms of Regulations that have been promulgated in terms of the Conservation of Agricultural Resources Act, No. 43 of 1983 further make it unlawful to allow various species of weeds and invader plants to grow. The

target species was Wild tobacco (declared weed), Pink Tamarisk (declared weed) and Mexican poppy, it also involved the community for job creation and training (2008).

Investigations for a Company near Prieska on Development of a biodiversity offsets policy for the applications for forestry tree licences for protected tree species.

Strategic Environmental Studies and Environmental Impact Assessment (EIA)

Undertaking of a Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006 for a Private Individual which involved the proposed extension of a roof over an existing deck with two wood pillars by means of the excavating of 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA. A Positive Record of Decision (ROD) Granted (2010).

Undertaking of an ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) near Boshof for a kimberlite Diamond Mining Company (2015)

Undertaking of a strategic environmental review and amendment for a Chinese group of Companies near Postmasburg. The study provided baseline environmental information and a high-level review of the potential impacts of various components of the development (2014 – 2016). Roelien worked as a member (EAP) of a large team consisting of a project Coordinator, attorneys, water specialists, other specialist and an engineer.

Environmental Impact Assessments for various developments including the proposed mining project for the former retrenchees of De Beers in Kimberley. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialist with contributions of specialist reports to compile the EIA EMP report (2017). Roelien worked as a member (EAP) of a team consisting of De Beers (attorneys and environmentalists), the retrenchees, the appointed contractor, EKAPA, and specialist appointed for the studies.

Environmental Impact Assessments for a Salt operation near Upington. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as part of a team with the Company and another consultant that started with the Water Use Licence application. The public participation was done to include the water use activities.

Environmental Impact Assessment for a change in scope of a prospecting right application consisting of the sole and exclusive right to prospect for iron, silver, zinc, copper and sulphur ore. This project involved coordination of the process, liaison with the authorities and compilation as well as appointment of specialists with contributions of specialist reports to compile the EIA EMP report (2019). Roelien also worked as a member (EAP) of a team consisting of the directors of the company and specialists appointed for the studies

7. CAREER PATH

01 April 1997 to 28 February 2005
DEPT OF MINERALS & ENERGY
Senior Environmentalist - Assistant Director Environment

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

01 March 2005 – 30 September 2012
Appointed as professional Mineral Law Administration and Environmental Manager for HC van Wyk Diamonds which was bought over in 2007 by a **Canadian group of Companies.**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans:
Formulation of an environmental policy and guidelines for the Group.
Participation in the development of the budget for environmental expenditure.
Co-ordination of technical studies (e.g. monitoring of groundwater quality).
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. Forestry Licences and water sampling for Water Use Licences).
Development of environmental guidelines for contractors on sites.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 October 2012 to 01 March 2020
Appointed as professional Mineral Law Administration and Environmental Manager for **Mentor Trade and Investments Pty Ltd**

MAIN JOB FUNCTIONS

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Formulation of an environmental policy and guidelines for the Mine.
Co-ordination of technical studies (e.g. monitoring of groundwater quality) as well as updating of the Mine's IWWMP.
Environmental compliance measurement and reporting with respect to environmental permit conditions (e.g. as water sampling and effluent).
Development of environmental guidelines for contractors.
Liaison with regulatory authorities on compliance with environmental legislation.
Documentation of environmental incidents.
Environmental awareness and training.
Development of a public participation strategy.
Formulation of a complaint's procedure.

01 March 2020 to Present
Appointed EAP on some projects for ***Wadala Mining and Consulting Pty Ltd***

Conducting of Environmental Impact Assessments (EIAs), including the implementation of public participation programmes, for a variety of projects.
Undertaking of environmental reviews, audits and management plans.
Liaison with regulatory authorities on compliance with environmental legislation.
Environmental awareness and training.

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur
Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEëL VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY, AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000-09-16