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SCOPING REPORT FOR CHANGES TO OPERATIONS AT UMK MINE

March 2017

**SUBMITTED FOR ENVIRONMENTAL AUTHORISATION IN TERMS OF THE
NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998) AND THE
NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT (ACT 59 OF 2008) IN
RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY AN
APPLICATION IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES
DEVELOPMENT ACT (ACT 28 OF 2002) (AS AMENDED)**

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SCOPING REPORT FOR CHANGES TO OPERATIONS AT UMK MINE

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ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
BID	Background information document
DAFF	Department of Agriculture, Forestry and Fisheries
dBA	A-weighted decibel
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental impact assessment
EMPR	Environmental management programme report
GN	General Notice
ha	Hectares
IAPs	Interested and/or affected parties
IWWMP	Integrated water and waste management plan
JMLM	Joe Morolong Local Municipality
Km	Kilometres
Kv	Kilovolts
m	Meters
mamsl	Metres above mean sea level
mm	Millimetres
MPRDA	Mineral and Petroleum Resources Development Act, 2002
MR	Mining Right
NEMA	National Environmental Management Act, 1998
NEM:WA	National Environmental Management: Waste Management Act, 2008
NWA	National Water Act, 1998
NGO	Non-government organisation
ROM	Run-of-mine
SACNSP	South African Council for Natural Scientific Professionals
SAHRA	South African Heritage Resources Agency
SANS	South African National Standards
SLR	SLR Consulting (Africa) (Pty) Ltd
SMS	Short Message Service
UMK	United Manganese of Kalahari (Pty) Ltd
WRD	Waste Rock Dump
WULA	Water Use License Application

SCOPING REPORT FOR CHANGES TO OPERATIONS AT UMK MINE

INTRODUCTION

INTRODUCTION TO THE PROJECT

United Manganese of Kalahari (Pty) Ltd (UMK) is proposing to amend its environmental management programme (EMP) to cater for operational changes and obtain related environmental authorisations for new listed activities and water uses on the farm Botha 313, the remaining extent (RE) of the farm Smartt 314, and portion 1 and RE of the farm Rissik 330 ('the project'). The UMK Mine is an opencast manganese mine located approximately 80 kilometres (km) north west of Kuruman, 21km south east of Black Rock, 42km north of Kathu and 13km south of Hotazel in the Northern Cape Province. The manganese mine lies directly adjacent and to the west of the R380 provincial road. See Figure 1 and Figure 2 for the regional and local settings respectively.

The existing environmental impact assessment and environmental management programme (EIA and EMP) report for UMK Mine was authorised in 2007 by the Northern Cape Department of Mineral Resources (DMR) (NC 30/5/1/2/3/2/1(113) MR) in terms of the Mineral and Petroleum Resources Development Act, 2002 (MPRDA, No. 28 of 2002), and the Department of Environment and Nature Conservation (DENC) (NC/KGA/HOT7/15/2006) in terms of the National Environmental Management Act, 1998 (NEMA, No. 108 of 1998). On 19 April 2015 a water use license (10/D41K/ABEGJ/2814) was issued for UMK by the Department of Water and Sanitation (DWS) in terms of the National Water Act, 1998 (NWA, No. 36 of 1998).

The mine consists of open-pit mining sections, crushing and screening operations, run of mine (ROM) stockpiles, waste rock and product stockpile dumps, and associated support and administrative infrastructure. Future approved surface activities and infrastructure will include dense medium separation, a sinter plant and mine residue deposit (tailings dam).

During the construction phase of the UMK Mine, the location and design of certain infrastructure components changed from what was approved in the EIA and EMP to support efficiency within the operations. Further to this, UMK proposes the expansion of the mine pit, waste rock dumps, product stockpiles and crushing operations. Support and administrative infrastructure either existing on site or still to be implemented includes: road truck parking area (hard park); conveyors; weighbridge; internal power lines; stormwater controls and water holding facilities; fuel farm and storage facilities; administrative offices, stores, contractors yard (including water and diesel storage facilities), change house and clinic; sewage treatment plant; bioremediation facility; salvage yard and temporary waste storage area (including waste tyres); workshops and wash bay; railway line and load-out-station; possible future sinter plant siding; possible emergency access point/escape route and internal access, maintenance and haul roads; core yard; laboratory and preparatory laboratory; and topsoil stockpiles.

SLR Consulting (Africa) (Pty) Ltd (SLR) has been appointed as the independent environmental assessment practitioner (EAP) responsible for undertaking the necessary environmental assessment and public participation process for the project.

SUMMARY OF AUTHORISATION REQUIREMENTS

Environmental authorisation is required from various government departments. These include:

- Amendment of an EMP in terms of the MPRDA which is regulated by the DMR.
- Environmental authorisation from the DMR in terms of the NEMA. The project incorporates several listed environmental activities. The applicable list of activities is provided in Section 2.3 (Table 2-2) of this report. The EIA regulations being followed for this project are Government Notice Regulation (GNR) 982 of 4 December 2014 (EIA Regulations).
- A waste management license from the DMR in terms of the National Environmental Management: Waste Act, 2008 (NEM:WA, No 59 of 2008). The applicable list of activities as currently set out in the legislation is provided in Section 2.3 (Table 2-2) of this report.
- Amendment of the water use license in terms of the NWA which is regulated by the DWS. The applicable water uses in terms of Section 21 of the NWA include (a – abstraction of water from a water resource), (b – storing water), (g – disposing of waste in a manner which may detrimentally impact on a water resource), and (j – removing of water found underground if it is necessary for the continuation of an activity or for the safety of people).

Any additional approvals/permits needed for the project will be identified during the course of the EIA process. A detailed list of such requirements will be provided in the EIA and EMP report.

Other permits in terms of health/safety regulations might be required but does not form part of the EIA process.

STRUCTURE OF THE REPORT

The scoping report is structured in accordance with the DMR scoping report template and the NEMA EIA regulations (set out in GNR 982).

SUMMARY OF EIA OBJECTIVES

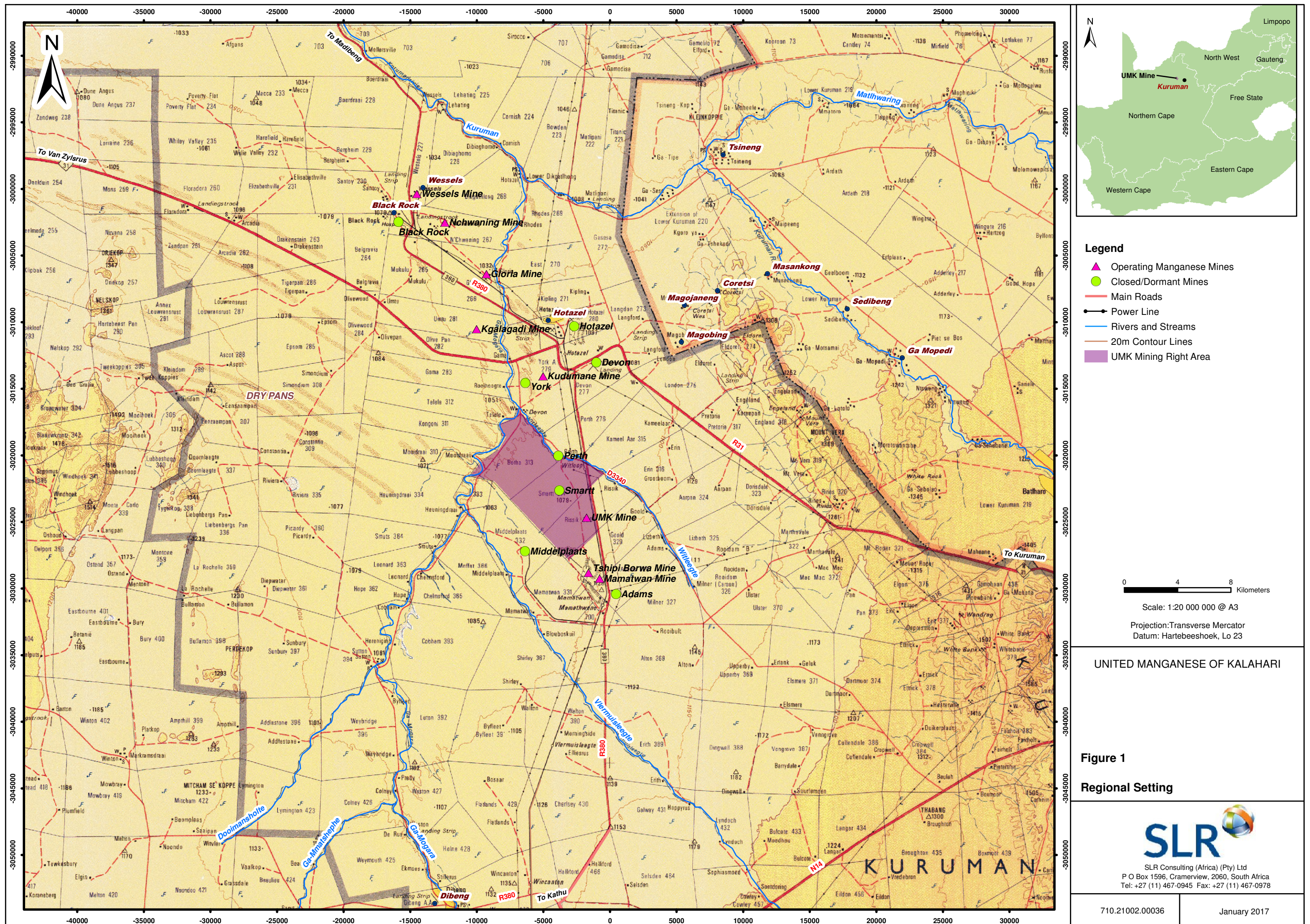
An Environmental Impact Assessment is conducted in two phases. The first phase is scoping and the second phase is the EIA and EMP phase. The objectives of these phases are briefly outlined below.

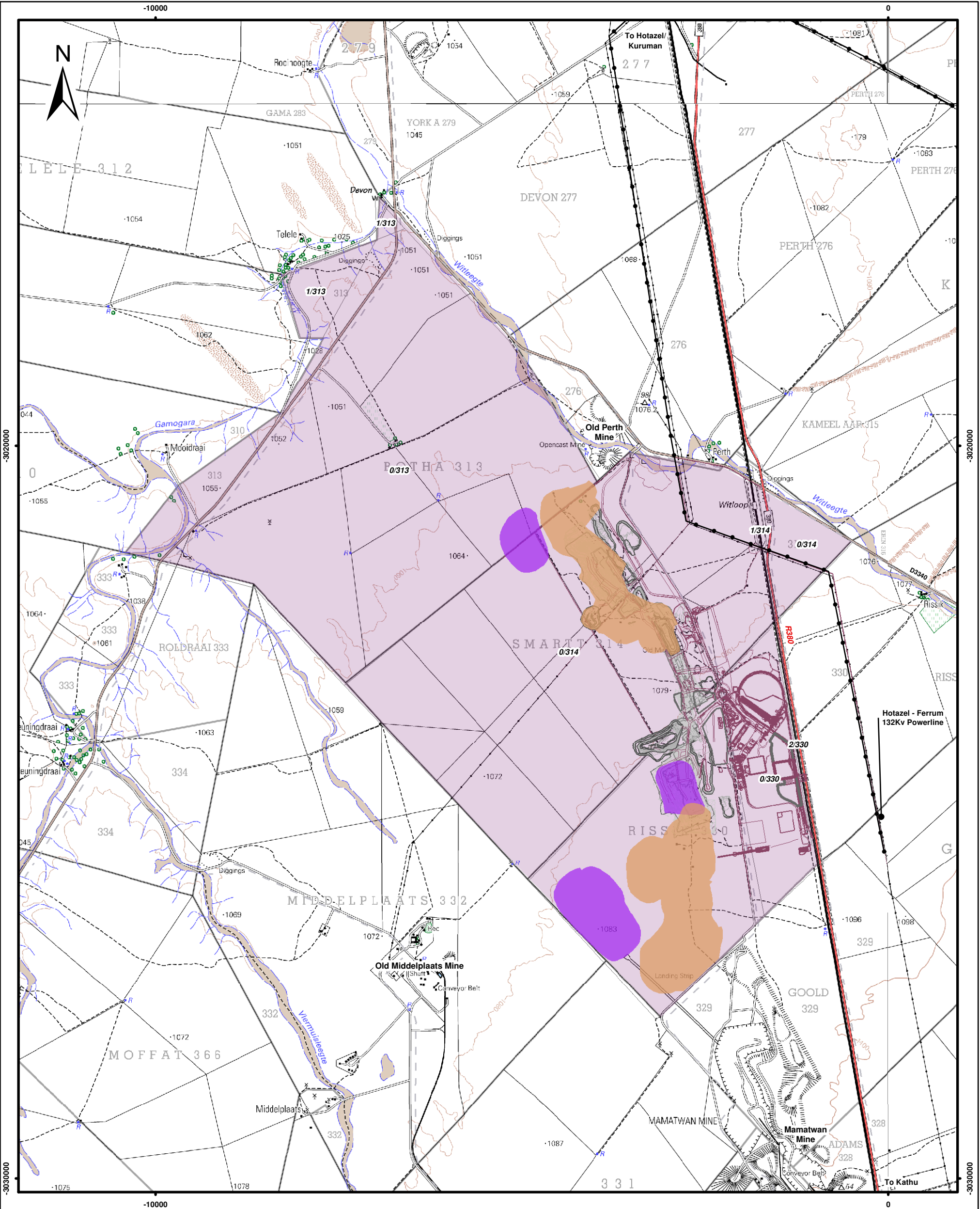
Scoping Phase

In the context of the project the scoping phase activities are to: identify relevant policies and legislation; consider the need and desirability, consider alternative technologies and sites; identify the potential environmental issues; determine the level of assessment and public participation required for the EIA and EMP phase; and identify preliminary measures to avoid, mitigate or manage potential impacts.

EIA and EMP Phase

The objectives of the EIA phase are to assess the potential impacts associated with the preferred project alternatives as per the terms of reference for the assessment that are set out in the scoping report. The EIA and EMP report will document the assessment findings and will detail the measures required to avoid, mitigate and/or manage the potential impacts.





Legend

- UMK Mining Right Area
- Proposed Waste Rock Dump Expansion
- Proposed Mine Pit Expansion
- Infrastructure
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines

0 1 000 2 000
Meters
Scale: 1:50 000 @ A3
Projection: Transverse Mercator
Datum: WGS1984, Lo23

UNITED MANGANESE OF KALAHARI

Figure 2
Local Setting and Site Plan



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1 DETAILS OF THE EAP

1.1 DETAILS OF THE EAP WHO PREPARED THE REPORT

The details of the environmental assessment practitioners (EAPs) that were involved in the preparation of this scoping report are provided in Table 1-1 below.

TABLE 1-1: DETAILS OF THE EAP

DETAILS	PROJECT MANAGER	REVIEWER
Name of the practitioner	Marline Medallie	Alex Pheiffer
Responsibility on the project	EAP	EAP, Reviewer
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Neither SLR Africa nor any of the specialists involved in the EIA process have any interest in the project other than fair payment for consulting services rendered as part of the EIA process.

1.2 EXPERTISE OF THE EAP

Marline Medallie holds a Masters Degree and has over 9 years of relevant experience in the assessment of impacts associated with mining operations. Alex Pheiffer has over 16 years of relevant experience and is registered as a Professional Natural Scientist (PrSciNat) in Environmental Science with the South African Council for Natural Scientific Professions. Both Alex and Marline have been involved in several impact assessments for large scale mining developments in South Africa. Proof of registrations of the relevant practitioners is provided in Appendix 1 and relevant curricula vitae are attached in Appendix 2.

2 PROJECT DESCRIPTION

2.1 PROJECT LOCALITY

A description of the property on which the project is located is provided in Table 2-1.

TABLE 2-1: DESCRIPTION OF THE PROPERTY

DESCRIPTOR	DETAIL	
Farm Name	Rissik 330 remaining extent Rissik 330 portion 1 Smartt 314 remaining extent Botha 313	
Application area (Ha)	Total area of disturbance of the expansion project is approximately 613ha	
Magisterial district	Kuruman Magisterial District	
Distance and direction from nearest town	The UMK Mine is located approximately 13 kilometres south of Hotazel, 21km south east of Black Rock, 42km north of Kathu and 80km north west of Kuruman.	
DESCRIPTOR	DETAIL	
21 digit Surveyor General Code for each farm portion	21 DIGIT CODE	FARM PORTION
	C0410000000033000001	Rissik 330 portion 1
	C0410000000033000000	Rissik 330 remaining extent
	C0410000000031400000	Smartt 314 remaining extent
	C0410000000031300000	Botha 313

A map showing the locality and setting of the project site is provided in Appendix 3.

2.2 DESCRIPTION OF THE SCOPE OF THE PROJECT

2.2.1 LISTED AND SPECIFIED ACTIVITIES

Table 2-2 and Table 2-3 list the activities and infrastructure associated with the project. In each case the relevant listed activity is identified and comprises the NEMA and NEM:WA activities applied for.

An infrastructure plan of the project, showing the location and extent of all of the activities detailed in the Table is provided in Appendix 4.

TABLE 2-2: LISTED ACTIVITIES OF THE PROJECT

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
Site preparation		
Selective clearing of vegetation in areas designated for surface infrastructure.	Approximately (~) 613ha	NEMA: GNR. 983 (Activity 27) NEMA: GNR. 984 (Activity 17)
Earthworks		
Stripping and stockpiling topsoil and sub-soil and the establishment of a topsoil stockpile area and berm.	<ul style="list-style-type: none">• Soil stripping area (maximum of ~613ha);• Topsoil stockpiles (To be confirmed (TBC);• Topsoil berms (TBC).	NEMA: GNR. 983 (Activity 27) NEMA: GNR. 984 (Activity 17)
Cleaning, grubbing and bulldozing activities.	This forms part of the overall ~ 613ha of disturbance.	As above.
Digging trenches and foundations. Possible blasting.		
Establishing storm water controls (channels, berms) as per storm water management plan.		
Bulk earthworks including building of dam walls and safety berms.		
Civil works		
General building activities and erection of structures.	This forms part of the overall ~ 613ha of disturbance.	As above.
Foundation excavations and compaction.		
Mixing of concrete and concrete work.		
Steel work (including grinding and welding).		
Open pit mining		
Expansion of opencast mining.	~ 400ha.	NEMA: GNR. 983 (Activity 12) NEMA: GNR. 983 (Activity 27) NEMA: GNR. 984 (Activity 17) NEMA: GNR 984 (Activity 17).
Partial backfilling the open pit with waste rock.		NEMA: GNR. 983 (Activity 34) NEMA: GNR. 984 (Activity 17) NEM:WA: GNR 921 Category B (Activity 4(7)).
Blasting and drilling.		NEMA: GNR 983 (Activity 12) NEMA: GNR 984 (Activity 17)
Processing plant		
Establishment of the semi-mobile and mobile crusher area, the primary and	~ 8.9ha	NEMA: GNR 983 (Activity 27)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
secondary crusher area and the J-Block extended crushing area.		NEMA: GNR 983 (Activity 34) NEMA: GNR 984 (Activity 21) NEMA: GNR 984 (Activity 28)
Transportation		
Establishment of emergency access point/escape route and lengthening/widening of internal access and maintenance roads.	~ 8.9ha	NEMA: GNR 983 (Activity 12) NEMA: GNR 983 (Activity 56) NEMA: GNR 984 (Activity 17)
Loading, hauling and transportation of ROM, product and materials.	~ 11ha	NEMA: GNR 983 (Activity 27) NEMA: GNR 984 (Activity 17)
Conveyors and weighbridge	<ul style="list-style-type: none"> Conveyor (~1.5ha); Weighbridge (~ 0.016ha). 	NEMA: GNR 984 (Activity 17)
Mineralised waste		
Expansion of waste rock dumps (WRD) and berms.	~ 171ha	NEMA: GNR 983 (Activity 27) NEMA: GNR 983 (Activity 34) NEMA: GNR 984 (Activity 17) NEM:WA: GNR 921 Category B (Activity 4(7)) NEM:WA: GNR 921 Category B (Activity 4(10)) NEM:WA: GNR 921 Category B (Activity 4(11))
Product stockpiles: <ul style="list-style-type: none"> -6mm product stockpile; Kidney product stockpile; Two mobile crusher stockpiles; Three product stockpiles. 	<ul style="list-style-type: none"> -6mm product stockpile (~ 4.42ha); Kidney product stockpile (~ 1.58ha); Two mobile crusher stockpiles (~ 4.3ha); Three product stockpiles (~ 42ha). 	NEMA: GNR. 983 (Activity 27) NEMA: GNR. 983 (Activity 34) NEMA: GNR. 984 (Activity 17)
ROM stockpiles.	~ 1.28ha	NEMA: GNR. 983 (Activity 27) NEMA: GNR. 983 (Activity 34) NEMA: GNR. 984 (Activity 17)
Non-mineralised waste (General and hazardous waste)		
Storage of general waste (industrial - scrap metal, contaminated wood, tyres	<ul style="list-style-type: none"> Waste yard (~ 3.2ha); 	NEM:WA: GNR 921 Category A (Activity

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
and building rubble; and domestic waste - packaging and food waste) as waste/salvage yard.	<ul style="list-style-type: none"> Bioremediation facility (~ 0.25ha). 	3(2)) NEM:WA: GNR 921 Category A (Activity 3(12)) NEM:WA: GNR 921 Category B (Activity 4(4)) NEM:WA: Category B (Activity 4(10))
Storage of hazardous waste (industrial – packaging of hazardous materials, used oil, and lubricants; and medical – swabs and bandages) as waste/salvage yard.		
Bailing sorting, re-use and recycling of waste respectively.		
Storage and/or treatment of contaminated soils (bioremediation facility).		
Removal of waste by contractor for recycling, re-use and/or final disposal at permitted waste disposal facilities.	Not applicable.	
Water supply, use and management		
Stormwater controls and water holding facilities: <ul style="list-style-type: none"> Seven dirty water dams; Three potable water storage tanks; 1 million litre potable water reservoir; Plant reservoir (in-pit mine dam); Service and dust suppression water storage tanks; Eighteen 10 000l JoJo tanks; Clean and dirty water pipelines. 	<ul style="list-style-type: none"> Seven dirty water dams (~ 1.142ha); Three potable water storage tanks (~0.018ha); 1 million litre potable water reservoir (~ 0.03ha); Plant reservoir (in-pit mine dam) (~ 0.5ha); Service and dust suppression water storage tanks (TBC); Eighteen 10 000l JoJo tanks (~ 0.0064ha); Clean and dirty water pipelines (TBC). 	NEMA: GNR 983 (Activity 27) NEMA: GNR 983 (Activity 34) NEMA: GNR 983 (Activity 45) NEMA: GNR 983 (Activity 46) NEMA: GNR 984 (Activity 17)
Support infrastructure/services		
Establishment of supporting infrastructure: <ul style="list-style-type: none"> Administrative offices, stores, contractors yard (including water and diesel storage facilities), change house and clinic; Road truck parking area (hard park) Power lines; Preparatory laboratory; Core yard; Workshops and wash bays; Railway line and load-out-station; Possible sinter plant siding. 	<ul style="list-style-type: none"> Administrative offices, stores, contractors yard (including water and diesel storage facilities), change house and clinic (TBC); Road truck parking area (hard park) (~ 1.43ha); Power lines (~ 2.7ha); Preparatory laboratory; Core yard (~ 1ha); Workshops and wash bays (~ 3.2ha); Railway line and load-out-station (~ 4ha); Possible sinter plant siding (TBC). 	NEMA: GNR 983 (Activity 27) NEMA: GNR 984 (Activity 9) NEMA: GNR 984 (Activity 12) NEMA: GNR 984 (Activity 17)
Fuel farm and storage.	~ 0.05ha	NEMA: GNR 983 (Activity 27); NEMA: GNR 983 (Activity 51); NEMA: GNR 984 (Activity 17).

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
General site management		
Appointment of contractors.	Not applicable.	Not applicable.
Site management (monitoring, inspections, maintenance, security, access control).		
Environmental awareness training and emergency response.		
On-going rehabilitation of facilities/disturbed areas.		
Implementing and maintaining management plans.		
Demolition		
Dismantling and demolition of infrastructure and equipment. Possible blasting.	Within the project footprint described above.	Not applicable.
Utilisation of site supporting services (security and access control, portable toilets, diesel storage tanks (re-fuelling equipment)).		
Rehabilitation		
Replacing soil resources.	~ 613ha.	Not applicable.
Slope stabilisation and erosion control.		
Landscaping.		
Re-vegetation of disturbed areas and where infrastructure was removed.		
Removal of alien invasive species from rehabilitated sites.		
Restoration of natural drainage patterns as far as practically possible.		
Rehabilitation of access roads.	~ 8.9ha	
Maintenance and aftercare		
Initiation of aftercare and maintenance program.	~ 613ha.	Not applicable.
Maintenance of rehabilitated areas.		

TABLE 2-3: DESCRIPTION OF THE LISTED ACTIVITIES APPLIED FOR AS PART OF THE PROJECT

ACTIVITY NUMBER	LISTED ACTIVITY
NEMA LISTING NOTICE 1 GNR.983	
GNR 983 List 1 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;

ACTIVITY NUMBER	LISTED ACTIVITY
	<p>(iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size;</p> <p>(v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size;</p> <p>(vi) bulk storm water outlet structures exceeding 100 square metres in size;</p> <p>(vii) marinas exceeding 100 square metres in size;</p> <p>(viii) jetties exceeding 100 square meters in size;</p> <p>(ix) slipways exceeding 100 square meters in size;</p> <p>(x) buildings exceeding 100 square meters in size;</p> <p>(xi) infrastructure or structures with a physical footprint of 100 square meters or more;</p> <p>where such development occurs–</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, within 32 meters of a watercourse, measured from the edge of a watercourse; –</p> <p>excluding–</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area; or</p> <p>(ee) where such development occurs within existing roads or road reserves.</p>
GNR 983 List 1 Activity 27:	<p>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–</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>
GNR 983 List 1 Activity 34:	<p>The expansion or changes to existing facilities for any process or activity where such expansion or changes will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions or pollution, excluding–</p> <p>(i) where the facility, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or</p> <p>(ii) the expansion of or changes to existing facilities for the treatment of effluent, wastewater or sewage where the capacity will be increased by less than 15 000 cubic metres per day.</p>
GNR 983 List 1 Activity 45:	The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure -

ACTIVITY NUMBER	LISTED ACTIVITY
	(i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion - (aa) relates to transportation of water or storm water within a road reserve; or (bb) will occur within an urban area.
GNR 983 List 1 Activity 46:	The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure - (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion - (aa) relates to transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve; or (bb) will occur within an urban area.
GNR 983 List 1 Activity 51:	The expansion of facilities for the storage, or storage and handling, of a dangerous good, where the capacity of such storage facility will be expanded by more than 80 cubic metres.
GNR 983 List 1 Activity 56:	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre– (i) where the existing reserve is wider than 13.5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.
NEMA LISTING NOTICE 2: GNR.984	
GNR 984 List 2 Activity 9:	The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex.
GNR 984 List 2 Activity 12:	The development of railway lines, stations or shunting yards excluding - (i) railway lines, shunting yards and railway stations in industrial complexes or zones; (ii) underground railway lines in a mining area; or (iii) additional railway lines within the railway line reserve.
GNR 984 List 2 Activity 17:	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

ACTIVITY NUMBER	LISTED ACTIVITY
GNR 984 List 2 Activity 21:	Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.
GNR 984 List 2 Activity 28:	Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), excluding - <ul style="list-style-type: none"> (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (iii) the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.
NEM:WA LISTED ACTIVITIES GNR 921	
Category A 3(2)	The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1,000m ² .
Category A 3(12)	The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).
Category B 4(4)	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.
Category B 4(7)	The disposal of any quantities of hazardous waste to land.
Category B 4(10)	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).
Category B 4(11)	The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

2.2.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

Information provided in the following section was provided to SLR by the UMK project team.

In broad terms the UMK project caters for:

- changes in the location and design of approved infrastructure components;
- expansion of the mining operations; and
- support and administrative infrastructure either existing on site or still to be implemented.

These are outlined in Table 2-4 below.

TABLE 2-4: ACTIVITIES TO BE UNDERTAKEN

REPOSITIONED INFRASTRUCTURE/FACILITIES	DESIGN CHANGE OF INFRASTRUCTURE/FACILITIES	ADDITION/INCREASE OF INFRASTRUCTURE/FACILITIES – ALREADY IMPLEMENTED	ADDITION/INCREASE OF INFRASTRUCTURE/FACILITIES – NOT YET IMPLEMENTED
-	-	-	Expansion of open-pit mining production to ~3.8mtpa, and footprint size to 400ha.
Primary and secondary crushing and screening plant (tertiary crushing and screening plant no longer required).		Semi mobile crushing area.	<ul style="list-style-type: none"> J-block extended crushing area. Mobile crushing area.
Conveyors.	Tie in new ROM blending area conveyor with existing plant stacker/reclaimer facility.	-	Conveyor from semi mobile crusher to plant area with tipping/blending facility.
-	-	<ul style="list-style-type: none"> -6mm product stockpile Kidney product stockpile area and platform ROM stockpiles Two mobile crusher stockpiles (semi mobile and mobile). 	<ul style="list-style-type: none"> Three product stockpiles. Two ROM stockpiles.
Sewage treatment plant.	Sewage treatment plant - from waste stabilisation point system to activated sludge system.	-	-
Two waste rock dumps.	-	Four waste rock dumps.	Three waste rock dumps.
Two dirty water dams.	-	Five dirty water dams/ponds.	Three dirty water dams/ponds (pollution control dams).
Workshops and wash bays (including stores, tanks and handling areas).	-	Temporary wash bay	-
-	-	Road truck parking area (hard park).	High Density Vehicles (HDV) parking area (hard park).
Railway siding and load-out station.			Possible sinter plant siding.
-	-	Weighbridges.	-
Potable water storage tanks.	-	<ul style="list-style-type: none"> Three potable water storage tanks at Four Arrows construction camp. 1 million litre tank/reservoir. 	New reservoir (in-pit mine dam).
Fuel bay (fuel farm).	-	Fuel farm capacity increase to ~ 42,000l.	-

REPOSITIONED INFRASTRUCTURE/FACILITIES	DESIGN CHANGE OF INFRASTRUCTURE/FACILITIES	ADDITION/INCREASE OF INFRASTRUCTURE/FACILITIES – ALREADY IMPLEMENTED	ADDITION/INCREASE OF INFRASTRUCTURE/FACILITIES – NOT YET IMPLEMENTED
Service and dust suppression water storage.	-	Service and dust suppression water storage number and capacity: <ul style="list-style-type: none"> • Tank 1 (56m³); • Tank 2 (217m³); • Tank 3 (217m³); • Tank 4- Fire water (87m³); • Fire water tank with booster pump (217m³); • Three 120m³ tanks at 4 Four Arrows construction yard; • 1 million litre tank/reservoir; • Fourteen 10,000l JoJo tanks. 	Four 10,000l JoJo tanks.
Eskom substation.	-	-	Internal power line to current HDV wash bay.
Laboratory.	-	-	Prep laboratory.
-	-	Possible D3340 emergency access point/escape route.	-
Administrative offices, stores, contractors yard, change house and clinic).	-	-	-
Two topsoil stockpile areas.	-	3 topsoil stockpile areas.	4 topsoil stockpile areas.
Salvage yard and temporary waste storage area (waste yard).	-	Waste tyre area.	-
Contractors yard, and water and diesel storage facilities.	-	-	-
-	-	-	Core yard.
-	-	-	Bioremediation facility.

2.2.2.1 Construction Phase

This section focuses on the facilities/infrastructure still to be implemented.

Construction Activities

The following activities are expected to take place during construction:-

- Clearing of vegetation in accordance with the relevant vegetation management procedures;
- Stripping and stockpiling of soil resources and earthworks in accordance with the relevant soil conservation procedures;
- Sourcing of material for construction;
- Establishment/installation of water management facilities;
- Establishment of additional internal haul roads.

Construction Infrastructure/Facilities

The construction phase facilities could include:-

- Contractor's laydown area(s);
- Workshops/maintenance area for servicing and maintaining equipment and vehicles;
- Temporary waste collection and storage area;
- Store for the storing and handling of fuel, lubricants, solvents, paint and construction substances;
- Soil stockpiles;
- Water management infrastructure; and
- Emergency access point from the D3340 road and internal access, maintenance and haul roads;

These facilities would either be removed at the end of the construction phase or incorporated into the layout of the operational mine.

Transport System

Roads

Access to the mine is via an existing tarred road from the R380 provincial road. This access point will be used during construction. In the case of emergencies, alternative access will be provided via the existing D3340 private gravel road that links to the R380.

Additional project traffic will be generated (increased of ~20%) during the construction phase, mainly for the delivery of construction materials to, removal of construction waste from and transport of construction workers to and from site. The project's trip generation and traffic loads will be provided in the EIA report.

Water Supply and Management

Potable and construction water

During the construction phase, potable water will be sourced from the mine's supply of water from the Vaal Gamagara water pipeline operated by Sedibeng Water. Sufficient capacity is expected to be available to support construction phase. This will be confirmed in the EIA and EMP.

Power Supply and Use

During the construction phase power will be sourced from the mine's existing Eskom supply. The alternative of generators is also being investigated. Sufficient capacity is expected to be available to support construction phase. This will be confirmed in the EIA and EMP.

Non-mineralised Waste Management

Domestic and industrial waste

Facilities for the temporary storage of non-mineralised waste exist on site. The types of waste that could be generated during the construction phase include: hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants), general industrial waste (such as scrap metal, contaminated wood and building rubble), and domestic waste (such as packaging and food waste). These wastes will be temporarily handled and stored on site within the mine's existing waste management system before being removed for recycling by suppliers and approved waste handling companies, re-use by scrap dealers or final disposal at permitted waste disposal facilities in the area.

Sewage

Construction workers will make use of existing ablution facilities. These ablution facilities are linked to the existing sewage treatment plant on site.

Employment and Housing

An estimated 120 employment opportunities will be available during the construction phase. No housing will be provided on site as construction workers will be accommodated in the nearby towns of Hotazel, Black Rock, Kathu or Kuruman.

Operating Hours

It is anticipated that the construction phase will consist of 1 shift per day from 06h00 to 18h00 from Monday to Saturdays. In the instance where emergency action or critical activities are required, motivation will be provided for the extension of the construction hours.

Timing

Provided the required authorisations are obtained, construction is expected to commence towards the end of 2017 and take approximately 18 months to complete.

Security and Access Control

The existing fence around the perimeter of the UMK Mine, and the designated access control and security office already in place will be utilised during the construction phase. No additional fences will be erected.

2.2.2.2 Operational Phase

The UMK Mine currently consists of open-pit mining sections, crushing and screening operations, run of mine (ROM), overburden/waste rock (waste rock) and product stockpile dumps, and associated support and administrative infrastructure. Future approved surface activities and infrastructure will include dense medium separation (DMS), a sinter plant and mine residue deposit (tailings dam).

This section provides an overview of the operations relative to the changes that have/will take place.

Surface infrastructure

Operational phase surface infrastructure is listed below:-

- Open-pit mining sections;
- Plant area consisting of a Primary and Secondary crushing and screening areas;
- Mobile and semi-mobile crushing and screening areas;
- J-Block extended crushing area;
- Plant conveyors;
- Topsoil stockpiles and berms;
- Waste rock dumps and berm;
- Run-of-mine (ROM) stockpiles
- Product stockpiles, -6mm product stockpile, kidney product stockpile, mobile crusher stockpiles, and final product stockpiles;
- Stormwater management facilities (drains, berms and recycled water ponds/ pollution control dams);
- Water holding facilities (dirty water dams/ponds, potable water storage tanks and reservoirs, service and dust suppression water storage tanks);
- Potable water, service water and sewage effluent pipelines;
- Eskom substation and internal power line;
- Road truck parking area (hard park);
- Possible D3340 emergency access point/escape route.
- Internal haul roads;
- Weighbridge;
- Possible future sinter plant siding;
- Administrative offices, stores, contractors yard (including water and diesel storage facilities), change house and clinic.
- Fuel farm and storage tanks;

- Laboratory and preparatory laboratory;
- Core yard;
- Workshop and wash bays (temporary and permanent);
- Salvage yard and temporary waste storage area including waste tyres (waste yard);
- Bioremediation facility.

Mining Operations

The open pit has a north-south orientation and is divided into a northern section (on the farms Smartt and Botha) and a southern section (on the farms Smartt and Rissik). The expansion of the open pits will continue using conventional open cast strip mining methods. It is anticipated that approximately 2 to 2.4 million tons of ore will be mined per year. Table 2-5 summarises the associated open cast activities and Table 2-6 summarises the crushing and screening facilities required.

TABLE 2-5: SUMMARY OF OPEN CAST ACTIVITIES

ACTIVITY	DESCRIPTION
Topsoil stripping	Topsoil will be stripped and stockpiled separately in accordance with the soil conservation management procedures.
Drilling and blasting	Once the topsoil and waste rock material have been removed, the hard overburden rock will be drilled as per a predetermined design. Charges for blasting will be designed to prevent excessive ground vibration, fly rock and air blast.
Removal of waste rock	The removal of the waste rock above the ore body will be done by means of dozing / loading and hauling with large equipment, and stockpiled on waste rock dumps. Some waste rock will be placed into some of the previously mined out areas thus ensuring that the rehabilitation is done concurrently to the mining, while others will be sloped/shape and made safe.
Removal of ore	The ROM ore will be transported via dump trucks to designated ROM stockpiles prior to being fed into the processing plant.
Rehabilitation and partial backfilling of pits	Rehabilitation will be concurrent with mining. Some waste rock will be used to partially backfill some of the open pits. Topsoil will be replaced on the waste rock to enable vegetation to re-establish. Excess topsoil will be stored in berms and designated stockpile areas in accordance with conservation management procedures immediately adjacent to areas where this topsoil will be used for rehabilitation at the end of the life of mine.

TABLE 2-6: SUMMARY OF CRUSHING AND SCREENING ACTIVITIES

ACTIVITY	DESCRIPTION
Semi mobile and mobile crushing and screening	<p>Ore from the ROM stockpile will be transported via front end loaders/ articulated trucks/ conveyor to the primary crushing area (consisting of a primary feed bin, vibrating grizzly, jaw crusher and stockpile area) in order to reduce the ROM material to a size required by the downstream processes.</p> <p>The crushed material from the primary crusher will be transported via conveyor to a surge bin that will in turn supply the triple deck screen in order to screen out the required product specifications.</p> <p>Oversize material from the screening process will be fed by means of conveyor to the secondary crusher area consisting of a cone crusher in order to further reduce any oversize material to the required specifications. The re-crushed material will be recirculated back to the screening plant.</p> <p>Correctly sized material will be fed to the final product stockpiles.</p>
Mobile crushing and screening	Other than crushing and screening equipment being track mounted for quick and easy relocation, material processing is similar to the semi mobile crushing and screening.

ACTIVITY	DESCRIPTION
J-Block extended crusher	ROM ore from the J-Block extended open-pit will be transported to the crusher. The crushed material will be conveyed to the permanent processing plant.
Product stockpiling	The correctly sized product from the screening plant will be fed onto three elevated product stockpile conveyors to three separate final product stockpiles e.g. lumpy, chips and fines. Due to limited stockpile space under the elevated stockpile conveyors the saleable product is moved to the mobile stockpile areas by means of front end loader and articulated dump trucks.
Transportation of product	Saleable product will be moved by front end loaders/ articulated trucks/ conveyor to the load-out station for removal off-site via railway/ truck for sale to third parties.
Dust suppression	Dust suppression will be utilised at all material handling transfer points.

Transport System

Roads

Access to the mine is via an existing tarred road from the R380 provincial road. In the case of emergencies, alternative access will be provided via the existing D3340 private gravel road that links to the R380.

A network of internal gravel haul roads is used for the internal transportation of workers and machinery. Within the site boundary additional haulage capacity will be established. This will consist of a combination of widening and lengthening existing gravel haul roads as well as the establishment of new gravel haul roads.

Additional transport related systems at the mine include weighbridges, a taxi and bus bay, parking areas and a delivery truck/manganese road hauler waiting area.

Additional project traffic will be generated (increase of ~20%) during the operational phase for the removal of operational waste from and transport employees to and from site. The project's trip generation and traffic loads will be provided in the EIA and EMP report.

Conveyors

Additional conveyors will be established within the existing plant area to allow for the movement of ore between the primary and secondary crushing and screening stations and the product stockpiles.

Pipelines

The project will require the expansion of existing and/or the establishment of a series of pipelines for the transportation of potable water, process water and sewage effluent.

Water Supply and Management

Potable and process water

Potable and service water is required by the mine and is stored in potable and process water storage tanks. A number of storage tanks exist on site for potable, service, fire and dust suppression water;

additional storage capacity is needed. The storage requirements of the mine will be detailed in the EIA and EMP report.

Potable water will continue to be made available from the Vaal Gamagara water pipeline operated by Sedibeng Water, while service water will be made available from the Vaal Gamagara pipeline and/or water from pit dewatering. Water requirements for the expanded operations will be detailed in the EIA and EMP report.

Stormwater management

The existing water management facilities for the control of storm water and prevention of pollution will be reviewed and where necessary, revised to meet the requirements of Regulation 704 (1999) of the NWA for water management on mines. The two main principle sections of Regulation 704 (4 June 1999) that is applicable to the stormwater management of the project include:

- Regulation 6 which describes the capacity requirements of clean and dirty water systems. Clean and dirty water systems must be kept separate and must be designed, constructed, maintained and operated such that these systems do not spill more than once in 50 years.
- Regulation 7 which requires that measures which must be taken to protect water resources from all dirty water or substances which cause or are likely to cause pollution of a water resource either through natural flow or by seepage.

Clean water will be diverted away from infrastructure areas by means of earth berms, and discharged back into the natural environment. Dirty water on-site will be contained in a dirty water management system comprising channels, drains, berms and dams. An updated stormwater management plan for the mine will be included in the EIA and EMP report.

Power Supply and Use

Power will continue to be sourced from Eskom by means of an existing substation/transformer connection of 10MVA at 132/11kV, upgradable to 15MVA for the sinter plant once commissioned. The external power line size is 132kV, with internal reticulation of power from the substation/transformer by means of 11KV power lines. Additional internal power distribution will be established at the mine.

Mineralised Waste Management

Waste rock associated with the project will be stored on waste rock dumps. The design features and characteristics will be in line with Section 4 of NEM:WA Regulations (GNR. 632 of 2015) and Section 73 of the MPRDA Regulations (GNR 527 of 2004). Waste rock will be used to partially backfill some of the open pits. The remaining waste rock will be stored on surface. The storage requirements for the mine will be detailed in the EIA and EMP report.

Non-mineralised Waste Management

Domestic and industrial waste

Facilities for the temporary storage of non-mineralised waste already exist on site. The types of waste that are generated by the mine include: hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants, tyres), general industrial waste (such as scrap metal and building rubble), medical waste (such as swabs and bandages) and domestic waste (such as packaging, canteen waste and office waste). These wastes are temporarily handled and stored on site within the mine's existing waste management system before being removed for recycling by suppliers and approved waste handling companies, reuse by scrap dealers or final disposal at permitted waste disposal facilities in the area.

Sewage

Ablution facilities and a sewage treatment plant are located on site. Sewage wastewater is pumped from the ablution facilities via a series of pipelines to the sewage treatment plant where treatment is by means of an activated sludge system. The sewage sludge is removed off-site by a reputable waste contractor for disposal at a licensed waste facility.

Additional Support Services and Facilities

In addition to the abovementioned core infrastructure and activities, the support services and facilities include the following:

- Workshops and wash bays (temporary and permanent) – used for servicing equipment and general maintenance.
- Fuel farm and stores, tanks and handling area at the workshops for storage of diesel with an increased capacity of 42,000 litres. The storage method of this substance is to contain them in sealed containers within impermeable, bunded areas with 125% capacity of the stored materials. Sumps, traps and pumps will also be provided to collect and remove spilled substances.
- Laboratory and preparatory laboratory – used for sample preparation and analysis.
- Administrative offices, stores, contractors yard (including water and diesel storage facilities), change house and clinic – used by employees and contractors.
- Salvage yard and temporary waste storage area – used for the temporary storage of waste (including waste tyres) before collection and removal.
- Road truck parking area (hard park) as an administration office and waiting area for delivery trucks or manganese road haulers.
- Weighbridge – used to weigh entire rail and road vehicles and their contents.
- Core yard – used for the storage of mineral drill core samples.
- Bioremediation facility – used for the treatment of soil through hydrocarbon contamination.

Employment and Housing

Currently ~ 830 employees are appointed by the UMK Mine during steady state production, including contractors. The expansion of the mining operations will not provide for any additional employment opportunities, but to sustain the current employment opportunities at the mine. No housing is provided on-site. Operational workers will be accommodated in nearby towns.

Operating Hours

The mine operates 24 hours a day for seven days a week. This will continue.

Life of Mine

The expansion of the mining operations will sustain the life of mine (LOM) of approximately 20 years.

2.2.2.3 Decommissioning and Closure

The conceptual closure plan objectives and principles include the following:

- Environmental damage is minimised to the extent that they are acceptable to all parties involved.
- The land is rehabilitated to achieve a condition approximating its natural state, or so that the envisaged end use of cultivated land is achieved.
- All surface infrastructure, excluding the tailings storage facility and some of the waste rock dumps will be removed from site after rehabilitation. Some of the open pits will be partially backfilled while the high walls of all the open pits and the waste rock dumps will be sloped/shaped and made safe.
- Mine closure is achieved efficiently, cost effectively and in compliance with the law.
- The social and economic impacts resulting from mine closure are managed in such a way that negative socio-economic impacts are minimised.

3 POLICY AND LEGISLATIVE CONTEXT

This section outlines the key legislative requirements applicable to the project. The table below provides a summary of the applicable legislative context and policy.

TABLE 3-1: LEGAL FRAMEWORK

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	RELEVANCE OR REFERENCE
Mineral and Petroleum Resources Development Act, 2002 (MPRDA, No. 28 of 2002).	See Section 0, page 1-2 and Section 3.1.1, page 3-5.
National Environmental Management Act, 1998 (NEMA, No. 107 of 1998).	See Section 0, page 1-2 and Section 3.1.2, page 3-6.
Environmental Impact Assessment regulations (Government Notice Regulation (GNR) 982, 983, 984 and 985, published 4 December 2014) (EIA Regulations) in terms of NEMA.	See Section 0, page 1-2 and Section 3.1.2, page 3-6.
DEA (2010), Guideline on Need and Desirability, Integrated Environmental Management Guideline Series 9, Department of Environmental Affairs.	See Section 4, page 4-1.
DEA (2010), Public Participation 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs.	See Section 6.2, page 6-2.
National Environmental Management: Waste Act, 2008 (NEM:WA, No 59 of 2008).	See Table 2-2 on page 2-2.
GNR 921 published 29 November 2013 in terms of NEM:WA including listed activities as amended in GNR 633.	See Table 2-2 on page 2-2.
National Water Act No. 36 of 1998 (NWA)	Section 6.8.
Regulation 704 of 1999 in terms of the NWA	Section 2.2.2.2 and 6.8.
SANBI Grasslands Programme's Mining and Biodiversity Guideline (2012)	See Section 6.4.1.7, page 6-21.
National Environmental Management: Biodiversity Act, 2004 (NEM:BA No 10 of 2004)	See Section 6.4.1.7, page 6-21.
Conservation of Agricultural Resources Act, 1983 (CARA, No. 43 of 1983);	See Section 6.4.1.7, page 6-21.
National Freshwater Ecosystem Priority Assessment (NFEPA) (2012)	See Section 6.4.1.7, page 6-21.
SANBI Wetland Inventory (2006)	See Section 6.4.1.7, page 6-21.
National Forest Act No. 84 of 1998	See Section 6.4.1.7, page 6-21.
National Veld and Forest Fire Act No. 101 of 1998	See Section 6.4.1.7, page 6-21.
International Union for Conservation of Nature (IUCN)	See Section 6.4.1.7, page 6-21.
Northern Cape Nature Conservation Act No. 9 of 2009	See Section 6.4.1.7, page 6-21.
National Protected Areas Expansion Strategy 2008 (NPAES)	See Section 6.4.1.7, page 6-21.
South African National Botanical Institute (SANBI) Integrated Biodiversity Information	See Section 6.4.1.7, page 6-21.
Joe Morolong Local Municipality Integrated Development Plan	See Section 6.4.2, page 6-27.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	RELEVANCE OR REFERENCE
Joe Morolong Spatial Development Framework	See Section 6.4.2, page 6-27.
John Taolo Gaetsewe District Municipality Integrated Development Plan	See Section 6.4.2, page 6-27.
National Heritage Resources Act, 1999 (NHRA, No 25 of 1999);	See Section 6.4.1.12, page 6-26.

This document has been prepared in accordance with the DMR Scoping Report template format, and was informed by the guidelines posted on the official DMR website. This is in accordance with the requirements of the MPRDA. In addition, this report complies with the requirements of the NEMA and EIA regulations (2014) GNR 982. The table below provides a summary of the requirements, with cross references to the report sections where these requirements have been addressed.

TABLE 3-2: STRUCTURING OF THE SCOPING REPORT

Legal and Regulatory Requirement		Cross Reference to Report Section
As per the DMR template	As per the GNR 982 Appendix 2 Section 2.	
	A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process:	
The EAP who prepared the report; Expertise of the EAP.	(a) details of: (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	See Table 1-1 on page 3-2, Appendix 1 and Appendix 2.
Description of the property.	(b) the location of the activity , including: (i) The 21 digit surveyor general code of each cadastral land parcel; (ii) Where available, the physical address and farm name ; (iii) Where the requirement information in terms (i) and (ii) is not available, the coordinates of the boundary of the property or properties .	See Table 2-1 on page 2-1.
Locality plan.	(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken ;	See Appendix 4.

Legal and Regulatory Requirement		Cross Reference to Report Section
As per the DMR template	As per the GNR 982 Appendix 2 Section 2.	
Description of the scope of the proposed overall activity, including listed and specified activities; Description of the activities to be undertaken.	(d) a description of the scope of the proposed activity : (i) all listed and specified activities triggered ; (ii) a description of the activities to be undertaken , including associated structures and infrastructure.	See Section 2.2, page 2-1.
Policy and legislative context.	(e) a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning framework and instruments that are applicable to this activity and are to be considered in the assessment process;	See Section 3, page 3-1.
Need and desirability of the proposed activity.	(f) a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	See Section 4, page 4-1.
Period for which the environmental authorisation is required.		See Section 5, page 5-1.
Description of the process followed to reach the proposed preferred site.	(h) a full description of the process followed to reach the proposed preferred activity , site and location within the site, including:	See Section 6, page 6-1.
Details of the alternatives considered.	(i) details of all the alternatives considered ;	See Section 6.1, page 6-1.
Details of the public participation process followed.	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	See Section 6.2, page 6-2.
Summary of issues raised by IAPs.	(iii) a summary of the issues raised by interested and affected parties , and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	See Section 0, page 6-2.
Environmental attributes associated with the sites.	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	See Section 6.4, page 6-14.
Impacts identified.	(v) the impacts and risks identified for each alternative , including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cb) can be avoided, managed or mitigated;	See Section 6.5, page 6-32.

Legal and Regulatory Requirement		Cross Reference to Report Section
As per the DMR template	As per the GNR 982 Appendix 2 Section 2.	
Methodology used in determining the significance of environmental impacts.	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	See Section 6.6, page 6-43.
The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternative will have on the environment and the community that may be affected.	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	See Section 6.7, page 6.7.
The possible mitigation measures that could be applied and the level of risk.	(viii) the possible mitigation measures that could be applied and level of residual risk ;	See Section 6.8, page 6-57.
The outcome of the site selection matrix. Final site layout plan.	(ix) the outcome of the site selection matrix ;	See Section 6.9, page 6-65.
Motivation where no alternative sites were considered.	(x) if no alternatives , including alternative locations for the activity were investigated, the motivation for not considering such and	See Section 6.10, page 6-65.
Statement motivating the preferred site.	(xi) a concluding statement indicating the preferred alternatives , including preferred location of the activity;	See Section 6.10, page 6-65.
Plan of study for the environmental impact assess process;	(i) a plan of study for undertaking the environmental impact assessment process to be undertaken, including;	See Section 7, page 7-1.
Description of alternatives to be considered including the option of not going ahead with the activity	(i) a description of the alternatives to be considered and assessed within the preferred site , including the option of not proceeding with the activity;	See Section 7.1, page 7-1.
A description of the aspects to be assessed as part of the environmental impact assessment process	(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	See Section 7.2, page 7-1.
Description of aspects to be assessed by specialists.	(iii) aspects to be assessed by specialists ;	See Section 7.3, page 7-2.
Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives.	(iv) a description of the proposed method of assessing the environmental aspects , including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	See Section 7.4, page 7-6.
Proposed method of assessing duration significance.	(v) a description of the proposed method of assessing duration and significance ;	See Section 7.5, page 7-6.
The stages at which the competent authority will be consulted.	(vi) an indication of the stages at which the competent authority will be consulted ;	See Section 7.6, page 7-6.

Legal and Regulatory Requirement		Cross Reference to Report Section
As per the DMR template	As per the GNR 982 Appendix 2 Section 2.	
Particulars of the public participation process with regard to the impact assessment process that will be conducted.	(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	See Section 7.7, page 7-6.
Description of the tasks that will be undertaken during the environmental impact assessment process.	(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	See Section 7.8, page 7-7.
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.	(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	See Section 7.9, page 7-8.
Undertaking regarding correctness of information;	(j) An undertaking under oath or affirmation by the EAP in relation to: <ul style="list-style-type: none"> (i) The correctness of the information provided in the report; (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties; 	See Section 9, page 9-1 and Appendix 5.
Undertaking regarding level of agreement.	(k) An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	See Section 9, page 9-1.
Other information required by the competent authority.	(l) Where applicable, any specific information required by the competent authority; and	No request received to date.
Other matter required in terms of section 24(4)(a) and (b) of the Act.	(m) Any other matter required in terms of section 24(4)(a) and (b) of the Act.	None identified.

3.1.1 MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002

The MPRDA governs all mining activities in South Africa and replaced the Minerals Act (No. 50 of 1991). In terms of the MPRDA, a mining right is required prior to the commencement of any mining activity. An applicant may only be granted a mining right, in terms of the MPRDA, if:-

- The mineral can be mined optimally and in accordance with a mining work programme;
- The applicant has access to financial resources and technical ability;
- The financial plan is compatible with the intended operations;
- The mining will not result in unacceptable pollution, ecological degradation or damage to the environment;

- The applicant has provided financially and otherwise for a social and labour plan;
- The applicant can comply with the provisions of the Mine Health and Safety Act;
- The applicant is not in contravention with provisions of this Act; and
- The granting of the right will further the objects of the MPRDA.

UMK currently holds the mineral rights over the UMK mining area in terms of the MPDRA and has submitted an EMP amendment application to the Department of Mineral Resources (DMR) over the same area (see Figure 2) in January 2017.

A key component of an EMP amendment application is the assessment of potential environmental impacts.

3.1.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998

The UMK project requires authorisation in terms of NEMA and the EIA Regulations. The DMR is the competent authority responsible for administration, review and decision-making (granting or refusal regarding this EIA).

Activities listed in GNR 983, 984 and 985 apply to the project and thus a full scoping and EIA is being conducted. An application form was submitted to the DMR on 30 January 2017. The listed activities which formed part of the application are listed in Table 2-2 above.

The applicable list of activities may be updated as the design of the project progresses during the EIA process. The EIA will specifically address the environmental impacts of the different activities and the EMP will deal with the management of activities to avoid or minimise environmental impacts.

3.1.3 NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008

Prior to December 2014, mining wastes and wastes incidental to mining, as defined in the National Environmental Management: Waste Act (No 59 of 2008) (NEMWA), did not require a waste management license (WML). However since 8 December 2014 residue deposits and residue stockpiles are no longer excluded from the ambit of the NEM:WA.

Various other non-mineralised wastes associated with the project and associated activities will also require licensing. The listed activities which formed part of the WML application are listed in Table 2-2 above.

NEM:WA requires an EIA process and reports structured in terms of the requirements of GNR 982 (EIA regulations) in terms of the NEMA. The DMR is the competent authority responsible for administration, review and decision-making (granting or refusal regarding this EIA).

The applicable list of waste activities may be updated as the design of the project progresses during the EIA process. The EIA will specifically address the environmental impacts of the different wastes and the EMP will deal with the management of wastes to avoid or minimise environmental impacts.

4 NEED AND DESIRABILITY OF THE PROJECT

The mine location has been selected on the basis of the presence of an economically mineable resource. The mine plan and revised site layout has been based on limiting the project footprint and trying to avoid sensitive areas where possible from an environmental and social perspective, while still considering engineering feasibility and financial factors.

Development of the mine supports the national SA economy at a macro level by gearing exports that will leverage foreign income to the country. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees. This is in line with the Joe Morolong Spatial Development Framework (GMLM, 2014) which identifies the promotion of mining job creation as one of the strategies to guide spatial development within the Joe Morolong Local Municipality given that mining forms the backbone of employment and is the main source of income within the local municipality. Further to this, through employment, persons at the mine will gain skills in the construction and operation of the mine in keeping with the skills upgrading and development which contributes to the building of the nation.

The expansion of the mining operations will also ensure continued local economic development through implementation of projects identified in the social and labour plan.

In addition to this, the project area is located in an area, being the Gamogara corridor, which is identified as a mining belt according to the Joe Morolong Spatial Development Framework (JMLM, September 2012). More detail relating to the need and desirability of the project will be provided in the EIA and EMP report.

5 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The estimated period is 22 years comprising 18 months for construction and 20 years for operations.

6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED ALTERNATIVE

6.1 ALTERNATIVES CONSIDERED

This section describes land use or development alternatives, alternative means of carrying out the operation, and the consequences of not proceeding with the project.

The main type of alternatives considered included:-

- Property or locality;
- Type of activity;
- Design or layout;
- Operational aspects; and
- The “no-go” alternative.

These are discussed further below.

6.1.1 PROPERTY OR LOCALITY

The property on which the mining expansion related activities will take place is dependent on the location of the target mineral resource. It follows that no alternatives could be considered for the mine site.

6.1.2 TYPE OF ACTIVITY

In broad terms the alternatives for mining and extracting target mineral resources are open cast or underground mining. Given the depth of the ore body the chosen alternative for the UMK project is opencast mining. No other alternatives are deemed feasible.

6.1.3 DESIGN OR LAYOUT

Infrastructure within the site layout has been optimised to improve efficiencies and productivity within the mine. The expansion areas for the open pits and waste rock dumps are dictated by the location of the fixed ore body. No other layout or design alternatives are applicable.

6.1.4 OPERATIONAL ASPECTS

No alternatives in terms of operational service aspects were considered as the services already approved, constructed and/or in use by the UMK Mine will be utilized and where required extended to cater for the project.

6.1.5 THE “NO-GO” ALTERNATIVE

The assessment of this option requires a comparison between the options of proceeding with the project with that of not proceeding with the project. Proceeding with the project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the project leaves the status quo. This will be detailed further in the EIA and EMP report.

6.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section describes the undertaking of the public participation process and details the information provided to the community, landowners and interested and affected parties (IAPs). The intent was to inform IAPs of what the project will entail, in sufficient detail, in order that IAPs may contribute meaningfully to the identification of impacts and alternatives.

6.2.1 INTERESTED AND AFFECTED PARTY (IAP) DATABASE

The project's public involvement database was developed by sourcing the mine's IAP database and verifying details relating to adjacent landowners by means of a deed search. Information was also verified through networking and direct consultation with IAPs. In addition to this, the project's public involvement database was supplemented with information on IAPs provided in the scoping meeting. A copy of the project's public involvement database is included in Appendix 5. The database will be updated on an on-going basis throughout the environmental process.

6.2.2 LANDOWNER AND OCCUPIER NOTIFICATIONS

During the week of the 16th of January 2017, background information letters were sent via email and post to the landowners and farmers within and surrounding the UMK Mine. The purpose of the background information letter was to inform IAPs about the project, the EIA process, possible environmental impacts and means of providing input into the EIA process. Proof of both notification email and delivery is attached in Appendix 5.

6.2.3 STATE DEPARTMENT NOTIFICATIONS

During the week of 16th of January 2017, letters were sent to the following authorities:-

- Department of Mineral Resources (DMR);
- Department of Water and Sanitation (DWS);
- Department of Environment and Conservation (DENC);
- South African Heritage Resources Agency (SAHRA);
- Department of Agriculture, Forestry and Fisheries (DAFF);
- Department of Rural Development and Land Reform (DRDLR);

- John Taolo Gaetsewe District Municipality;
- Joe Morolong Local Municipality; and
- Ward councillor (Ward 4).

The purpose of the background information letter was to inform authorities about the project, the EIA process, possible environmental impacts and means of providing input into the EIA process. Proof of both notification email and delivery is attached in Appendix 5.

6.2.4 SITE NOTICES AND ADVERTISEMENTS

On Monday 23rd of January 2017, site notices in English and Afrikaans were placed at key conspicuous positions in and around the project area. A map showing the laminated A2 site notices' distribution is included in Appendix 5. Press adverts were placed in the Kalahari Bulletin and Kathu Gazette on 26 January 2017 and 27 January 2017, respectively.

The press, and site notifications were undertaken to elicit interest from other IAPs that might not have been identified during the earlier stakeholder identification process. The advert and proof of site notices are included in Appendix 5.

6.2.5 BACKGROUND INFORMATION LETTER DISTRIBUTION

A background information letter was compiled for the project. The purpose of the letter was to inform IAPs and authorities about the project, the EIA process, environmental attributes, possible environmental impacts and means of providing input into the EIA process. The letter was made available in English and Afrikaans.

Letters were distributed to all identified stakeholders via email and post. The letter also included details of the planned public scoping meeting.

Copies of the letter together with the proof of distribution are included in Appendix 5.

6.2.6 PUBLIC MEETING

6.2.6.1 Information-sharing scoping meeting

A general public scoping meeting was held in Hotazel on 30 January 2017. The purpose of the meeting was as follows:-

- To provide an overview of the project;
- To provide an overview of the EIA process that will be undertaken for the project;
- To provide an overview and obtain input on the existing status of the environment;
- To outline and obtain input on impacts identified for the project;

- To record any comments and issues raised. These issues and concerns will be used to inform the Plan of Study for the EIA Phase; and
- Agree on the way forward and the logistics for report distribution.

Minutes of the public meeting is included in Appendix 5.

6.2.7 REVIEW OF THE DRAFT SCOPING REPORT

6.2.7.1 Public review of scoping report

The draft scoping report was made available for public review from the 10th of February 2017 (for 30 days) until close of business on the 10th of March 2017. Full copies of the report were placed at the following venues:

- Joe Morolong Local Municipality;
- John Taolo Gaetsewe District Municipality;
- Hotazel Public Library;
- Kathu Public Library;
- Black Rock Library.

Electronic copies of the scoping report were made available on the Public Documents page of the SLR website (www.slrconsulting.com/za).

IAPs were notified of when and where the scoping report will be available for review via e-mail and sms. IAPs were notified of this information at the public scoping meeting.

Summaries of the scoping report were made available to all IAPs registered on the public involvement database via e-mail and post.

6.2.7.2 Regulatory authority review of scoping report

The draft scoping report was made available for review by regulatory authorities registered on the public involvement database for a period of 30 days from the 10th of February 2017 until close of business on the 10th of March 2017.

Following the review period, the final scoping report will be submitted to the DMR inclusive of review comments from IAPs and other authorities.

6.3 SUMMARY OF ISSUES RAISED BY IAPS

A summary of the issues and concerns raised by IAPs and regulatory authorities (to date) in relation to the project are provided in Table 6-1 below. All issues submitted in writing by the 10th of March 2017 will be included in the final scoping report.

TABLE 6-1: SUMMARY OF ISSUES RAISED BY IAPS AND REGULATORY AUTHORITIES

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
Affected Parties				
Landowners or lawful occupiers on adjacent properties				
Chris Schutte Mvelaphande Trading	X	27 January 2017, background information letter comments.	Please provide us with sketches/maps that shows the stand numbers so that we can indicate our infrastructure on.	A copy of the locality and site layout map was submitted to Mr Schutte on 1 February 2017.
Hendrik Venter	X	29 January 2017, background information letter comments.	The bordering fence between Middleplaats 332 and Botha 313 and Smartt 314 is in extremely poor condition. This needs attention.	SLR has noted your comment for the attention of UMK.
Dawid Vilu	X	30 January 2017, public scoping meeting at Hotazel Recreational Club.	As mineralised waste rock gets dumped onto the waste rock dumps, some of the rock material tumbles over the boundary onto my farm. This results in fences being damaged and my livestock ending up in the UMK mining right area.	SLR has noted your comment for the attention of UMK.
Eben Anthonissen	X	30 January 2017, public scoping meeting at Hotazel Recreational Club.	I am the landowner of the farm Perth 276. My house is situated close to the operations. Just up the road from me is another mining company. As far as I know the farms Smartt and Botha are owned by different mining companies and UMK is in the process of purchasing the farms. The D3340 gravel road was DE proclaimed and the biggest portion of the road is located on my farm. UMK increased their footprint without consulting the DMR. Dust was dumped on the road and not rehabilitated. Technically UMK is trespassing using that road. I have applied for a section 24g in terms of NEMA. This has an impact on rural safety, littering, etc. A lot of leachate and surface runoff came out of the stuff that was dumped on the road and flowed into the Witteegte on my property. The commercial manager of UMK is aware of this. The contractors the mine and other mines in the area dump	The D3340 emergency access point/route is one of the listed activities applied for by UMK for use in emergency situations. This will be discussed with UMK and you will receive separate feedback regarding this issue (UMK).

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			waste next to that road and it flows into the Wittelegte. UMK contractors drove on that road and railway lines with excavators, which damaged the rail. Since UMK didn't lead by example, the third parties started using it thinking that they are allowed to. It is a problem for me since my farm workers don't want to stay in a house that has so much dust.	
			In winter, all the dust generated by the UMK Mine is concentrated in the Wittelegte Spruit which is in close proximity to where my farm workers stay. No dust suppression takes place. The distance between the entrance of the UMK Mine and the entrance to the farmstead on the D3340 road is approximately 400m.	SLR has noted your comment for the attention of UMK.
			Blasting damage: none of the surrounding mines wants to accept responsibility for the damage that their blasting does. There is currently no mine operated seismographs since it was stolen but I have taken readings myself.	Please keep record of all vibration readings recorded by yourself. This issue has been noted and will be addressed as part of the vibration and blasting study during the EIA and EMP phase. The additional work required to address this issue is set out in the vibration and blasting study terms of reference as per section 7.3.8.
			Noise: through usage of the D3340 road by UMK mining contractors during the day and at night. The UMK mining contractors have to stop using the D3340 as this is a private road since no one wants to take responsibility.	The D3340 emergency access point/route is one of the listed activities applied for by UMK for use in emergency situations. This will be discussed with UMK and you will receive separate feedback regarding this issue. Unfortunately, we cannot act on behalf of the third parties (UMK).
			Groundwater: unapproved activities (illegal dewatering) has taken place on the farm Perth, which has severely strained the aquifer on my farm. There isn't any recharge.	The groundwater specialist will be made aware of this issue for inclusion of your borehole(s) in the groundwater model.
			Particular care must be taken with the accumulation of water in the mine pit due the expansion project. If the mine pit is dewatered, it will have a huge impact on my groundwater levels.	This issue has been noted and will be addressed as part of the groundwater study during the EIA and EMP phase. The additional work required to address this issue is set out in the groundwater study terms of reference as per section 7.3.3 of the scoping report. All of the issues that you have raised will be discussed with UMK. We would rather fix the issues, discuss and reach an agreement with you regarding the issues (UMK).
			Where do you intend to get potable water supply from?	UMK has an allocation from the Gamagara water pipeline of the Sedibeng Water Scheme. Some of the water has also been

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
				approved for dust suppression, though since it is clean water, using it for dust suppression is only done as a necessity (UMK).
			How deep is the pit currently?	Maximum of 40m below the surface (UMK).
Eben Anthonissen	X	10 March 2017, scoping report comments.	<p>Thank you for including us this this amendment process, and I trust that from this process better management plans will develop that will ensure the peaceful and sustainable co-existence between UMK and relevant stakeholders directly affected through mining activities.</p> <p>I do have some thoughts on the scoping report and matters that I addressed during the public participation meeting that took place on the 30th of January 2017 on which I would like to clarify and elaborate on:</p> <p>1. De-proclaimed D3340 – The said road was de-proclaimed by the Department of Roads and Public Works during March 2013, duly published in the Provincial Gazette of that month and effectively closed, meaning that the area is enveloped by the property it was originally proclaimed from. Therefore, it is agricultural land managed by the relevant landowners. This particular road is primarily on the farm Perth, with a small portion on the farm Smartt, crossing the railway line and connecting with the R380 and it's on this road where the train derailment occurred in 2014. The importance of this road is that it is the only access point to Perth's vital agricultural infrastructure, it also divides a third party's mining area longitudinally, and it crosses the Witteegte watercourse twice. UMK used this road pre-2013 as an access point pending its application for certain waybills connected with the main gate on the R380. The use of the de-proclaimed road was supposedly not included in the existing management program which explains why UMK's footprint is still present in the form of scattered dust suppressant material due to no rehabilitation. Some of the problems currently connected with this road includes:</p>	SLR has noted your issue and recommendation for the attention of UMK Mine. The use of the D3340 as an emergency access road has been included in this EIA and EMP application process.

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			<ul style="list-style-type: none"> The landowner is liable for environmental degradation Dust generation Noise generation Access by unauthorized people Safety and security concerns UMK's primary mining contractor exits the mining area with earthmoving equipment, driving over the third party's mining area without authorization (exposing that third party with liabilities) to repair such equipment offsite and/or movement to different mines. <p>Recommendation/s: UMK to negotiate access with the landowner in order to reach agreements for use OR UMK to enter its mining area from the western side by means of the R3336 which is directly connected with the farm Botha.</p>	
			<p>2. Dust generation – as was mentioned in the public meeting, UMK's dust management programs do not include the farm Perth. During atmospheric stability in the colder months of the year, dust generated onsite accumulates in the low-lying Wittelegte where the vital agricultural infrastructure is situated. Farmworkers are continuously exposed to high concentrations airborne particulates in their living quarters, where some have already been diagnosed with lung-related illnesses, possibly not due to inhalable dust, but altering quality of life nonetheless.</p> <p>Recommendation: Expand the dust management network to Perth, with continuous interaction with the landowner and affected personnel regarding findings.</p>	SLR has noted your issue; it will be investigated and addressed by the Air Quality specialist and during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the air quality study terms of reference as per section 7.3.1 of the scoping report.
			<p>3. Blasting activities – Because Perth's vital agricultural infrastructure is already so closely located to UMK's existing activities (nearest neighbour to opencast operations by approximately 1km), damage to infrastructure has already occurred due to ground vibrations. These damages include newly built sheds, farmworkers' living quarters, and water</p>	SLR has noted your concern; it will be investigated and addressed by the Vibration and Blasting specialist and during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the vibration and blasting study terms of reference as per section 7.3.8 of the scoping report. It should be noted that as part of this EIA and EMP process, the

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			reservoirs. By expanding UMK's operation even closer to the existing agricultural infrastructures (the northern section of the pit), possible damage may occur more frequently. Furthermore, I have mistakenly been recorded in the minutes of the meeting that I captured seismographic readings, where I in fact mentioned that UMK did have a seismograph at the farmhouse which was unfortunately stolen a few years ago due to a lack of security. Recommendation/s: UMK to include Perth's agricultural infrastructure in the blast management plan with ongoing interaction with the landowner on findings, occurrences, damage and remedial impacts.	northern pit will not expand in a northerly direction. The minutes of the public scoping meeting held on 30 January 2017 have been amended accordingly (see Appendix 5 of the scoping report).
			4. Surface Water – The expansion of the northern section of the pit will be much closer to the Witteegte watercourse, which in turn would directly affect the natural drainage pattern of the surface water, and indirectly affect the recharge of the area's groundwater. Recommendation: Please follow with groundwater.	SLR has noted your concern; it will be investigated and addressed during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the respective specialist studies' terms of reference as per section 7.3 of the scoping report. It should be noted that as part of this EIA and EMP process, the northern pit will not expand in a northerly direction or closer to the Witteegte watercourse.
			5. Groundwater quality and yield – UMK does have an integrated monitoring network that includes Perth, but information relevant to Perth has never been furnished to the affected landowner. The particular borehole and aquifer on Perth, which forms part of the monitoring network, has been compromised and the quality of the water deteriorated over time. During the last 18 months of drought, the recharge to this borehole was inadequate and the borehole was never used for livestock watering as damage to the monopump equipment occurred because it ran dry (please keep in mind that a monopump in a borehole is a sealed unit and one cannot access the water levels without removing the whole installation). The chances of this aquifer to be under more	SLR has noted your issue; it will be investigated and addressed by the Groundwater specialist and during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the groundwater study terms of reference as per section 7.3.3 of the scoping report. Your recommendation for continuous interaction with the landowner is noted for the attention of UMK Mine.

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			<p>stress are very likely due to the expansion of the pit, in turn altering Perth's agricultural potential as the particular borehole is the only water resource on the property's western side.</p> <p>Recommendations: A watertight, improved and expanded groundwater monitoring program with continuous interaction with the landowner on findings, occurrences and remedial impacts.</p>	
			<p>6. Transport System – An estimation of a 20% increase in road traffic on the already deteriorated R380 would prove to have an increased difficulty by using Perth's registered livestock crossing over the said road.</p> <p>Already livestock is moved over the road by making use of important warning signs and particularly at strategic times when road traffic has somewhat subsided. It did occur at various instances where mine contractors ignored the warning signs and the highly visible farmworkers, and willfully drove into the animals. Not only is this a dangerous operation to agriculture but also very dangerous towards ignorant and spiteful road users as injuries to livestock has economic impacts, but loss of human life due to ignorance is most important and highly preventable.</p> <p>Recommendations: Please recommend as I currently do not have possible solutions.</p>	<p>SLR has noted your concern; the impacts on road traffic will be investigated and addressed during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the terms of reference as per section 7.3 of the scoping report.</p> <p>SLR has noted your comment for the attention of UMK Mine.</p>
			<p>7. Heritage Resources – The graveyard on Perth is situated close to the property's vital infrastructure and exposed to blasting damage and ground vibrations.</p> <p>Recommendations: A seismograph located at the farmhouse may prove vital in determining vibration impacts, but also yearly site inspections to determine damage.</p>	SLR has noted your concern; it will be investigated and addressed by the Heritage specialist, the vibration and blasting specialist and during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the heritage study and vibration and blasting study terms of reference as per section 7.3.9 and 7.3.8 of the scoping report.
			<p>8. Socio Economic Impacts – The landowner is currently struggling to ensure the health and safety of his personnel as</p>	SLR has noted your concern; the socio-economic impacts on potential receptors will be investigated and addressed during the

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			<p>cumulative unmanaged mining activities are making it almost impossible. Apart from the financial implications on the landowner, the farmworkers' quality of life is also inhibited, as mentioned previously.</p> <p>Recommendation: Better managed impacts from the mining sector's side with continuous interaction with the landowner.</p> <p>Finally, it is beneficial to communities by expanding the mine's operations but directly affected stakeholders should not be forgotten as current expanded mining activities do have negative socio-economic effects. The mine's interactions with negative affected stakeholders are limited which causes a grave concern of frustration and irrational conducts that must be prevented by see-through management and mitigation plans. After all, development is beneficial to everybody when impacts are mitigated and remedied in a sustainable manner.</p> <p>I trust you agree with me on the various matters.</p>	<p>EIA and EMP phase of the project. The additional work required to address this issue is set out in the respective specialist studies' terms of reference as per section 7.3 of the scoping report.</p> <p>Your recommendation for continuous interaction with the landowner is noted for the attention of UMK Mine.</p> <p>SLR has noted your concern: the socio-economic impacts on potential receptors will be investigated and addressed by the various specialist studies and during the EIA and EMP phase of the project. The additional work required to address this issue is set out in the respective specialist studies' terms of reference as per section 7.3 of the scoping report.</p> <p>Your recommendation for continuous interaction with negative affected stakeholders is noted for the attention of UMK Mine.</p>
Organs of state				
Land claims commissioner				
Ryan Oliver	X	23 January 2017, background information letter comments.	Please note that Ms Mkalipi and Ms Refilwe Sekwati will be responding to Land Claim Enquiries from now on.	SLR has noted your comment, the IAP database in Appendix 5 of the scoping report has been updated during the pre-application phase to include the correct contact details for future correspondence on land claim enquiries.
Department of Agriculture, Forestry and Fisheries				
Jacoline Mans	X	24 January 2017, background information letter comments.	<p>Thank you for the invitation to the Public Meeting. Please accept my apology. Due to budget constraints, we are not allowed to travel. May you please forward me a copy of the Minutes of the Meeting and/or any further EIA documentation for comments.</p> <p>Kindly ensure that the developer assesses the potential impacts on NFA Listed Protected Tree Species and plants protected</p>	<p>A copy of the public scoping meeting minutes is included in Appendix 5 of the scoping report and has been provided to Ms Mans on 10 February 2017. The Department of Agriculture, Forestry and Fisheries (DAFF) is registered as a regulatory authority and will be included in document review and future correspondence as part of the EIA process.</p> <p>This issue has been noted and will be addressed as part of the biodiversity study update during the EIA and EMP phase of the</p>

IAP DETAILS		DATE OF COMMENT	ISSUE RAISED	RESPONSE (as amended for the purposes of the scoping report)
			under the Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA).	project. The additional work required to address this issue is set out in the biodiversity study terms of reference as per section 7.4.
			This office would like to get copies of the EIA report on a C.D. or a hardcopy. Kindly note we cannot download documents via dropbox links. The report and specialist fauna and flora impact assessment can be posted to: DAFF (J. Mans), P.O. Box 2782, Upington, 8800 or courier: House 26, Olien Street, Louisvalemweg, Upington, 8801.	SLR has noted your request, the contact details have been included in the IAP database in Appendix 5 of the scoping report.
Adeyileka-Makungo Thivhonali Esther	X	9 March 2017, scoping report comments.	Considering that the Groundwater and geochemistry will be done, please ensure that 1 CD and a hard copy of final EIA is submitted to DWS for detailed comments; The IWWMP must be updated followed by a pre consultation meeting for the water use authorisation process.	SLR has noted your request. The IWWMP will be updated and submitted to the DWS together with a copy of the EIA and EMP.

6.4 ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE PROJECT

The baseline information provided here is aimed at giving the reader perspective on the existing status of the cultural, socio-economic and biophysical environment. More detailed information will be provided in the EIA report once the specialist reports and other research has been concluded.

6.4.1 TYPE OF ENVIRONMENT AFFECTED BY THE ACTIVITY

6.4.1.1 Geology

INTRODUCTION

The geology of a particular area will determine the following factors:

- The presence and quality of groundwater and the movement of the groundwater in the rock strata;
- The presence of palaeontological resources in the rock strata; and
- The potential for contaminant generation.

All of these aspects will be considered in the EIA and EMP. However, a basic description of the regional geology is provided below. More detailed information will be provided in the EIA and EMP.

Groundwater aspects are discussed in section 6.4.1.5 and palaeontological resources in section 6.4.1.12.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Regional geology

The UMK Mine is located on the Kalahari Manganese Field (KMF). Three beds of manganese ore are interbedded with the Banded Iron Formation (BIF) of the Hotazel Formation (Transvaal Supergroup). The mine is exploiting the manganese from the lower most bed.

The BIF of the Hotazel Formation typically consists of repeated thin layers of black iron oxides (magnetite or hematite) alternating with bands of iron-poor shales and cherts. The Hotazel Formation is underlain by basaltic lava of the Ongeluk Formation (Transvaal Supergroup) and directly overlain by dolomite of the Moodraai Formation (Transvaal Supergroup).

The Transvaal Supergroup is overlain unconformably by the Olifantshoek Supergroup which consists of arenaceous sediments, typically interbedded shale, quartzite and lavas overlain by coarser quartzite and shale.

The Olifantshoek Supergroup is overlain by Dwyka Formation which forms the basal part of the Karoo Supergroup and in turn is covered by typically sands, claystone and calcrete of the Kalahari Group.

6.4.1.2 Climate

INTRODUCTION

Climate can influence the potential for environmental impacts and related design associated with mining projects. Specific issues are listed below:

- Rainfall could influence erosion, evaporation, vegetation growth, rehabilitation planning, dust suppression, and surface water management planning.
- Temperature could influence air dispersion through impacts on atmospheric stability and mixing layers, vegetation growth, and evaporation which could influence rehabilitation planning.
- Wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

This section provides a brief description of the climatic environment. More detailed information will be provided in the EIA and EMP report.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Regional climate

The project area falls within the Northern Steppe Climatic Zone, as defined by the South African Weather Bureau. This is a semi-arid region characterised by seasonal rainfall, hot temperatures in summer, and colder temperatures in winter. The regional average daily maximum temperature varies between 30°C and 33°C in January and in July it is approximately 17°C. The regional average daily minimum temperature is about 15°C in January and in July it is roughly 0°C.

Rainfall

The mean annual rainfall is approximately 460mm. Rainfall is typically in the form of thunderstorms during the summer months of October to March. The peak rainy period occurs between the months of January to March. Rainfall is erratic and may vary significantly from year to year. Monthly average rainfall for each month is presented in Table 6-2 below.

TABLE 6-2: SUMMARY OF MONTHLY RAINFALL FOR THE PROPOSED PROJECT SITE

Month	Rainfall (mm)	
	Milner – 393083_W	Kuruman - 0393806
January	58.6	83
February	58.2	83
March	66.1	81
April	33.5	50

Month	Rainfall (mm)	
	Milner – 393083_W	Kuruman - 0393806
May	15.5	20
June	5.9	7
July	2.4	3
August	4.0	8
September	5.6	6
October	17.8	27
November	29.1	43
December	46.4	46
Annual	343.1	457

Evaporation

The mean annual (Lake) evaporation is approximately 1970 mm. A summary of the adopted evaporation data for the project area is provided in Table 6-3 below which indicates that the project area is characterised by high evaporation rates.

TABLE 6-3: SUMMARY OF EVAPORATION DATA

Months	Mean monthly lake evaporation (mm)
January	233
February	185
March	170
April	127
May	100
June	77
July	88
August	124
September	172
October	218
November	233
December	244
Total	1971

Temperature

The regional average daily maximum temperature varies between 27°C and 31°C in January and in July it is approximately 19°C. The regional average daily minimum temperature is about 16°C in January and in July it is roughly 1°C.

Wind

The prevailing wind direction at the project site is in a north easterly direction with significant winds also blowing from the north and northwest. The strongest winds up to 10m/s primarily during the summer.

6.4.1.3 Air quality

INTRODUCTION

A change in ambient air quality can result in a range of impacts, which in turn, may cause a disturbance to nearby receptors. As a baseline, this section provides a short description of existing conditions in the area from which to measure changes as a result of the project. More detailed information will be provided in the EIA and EMP.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Existing emission sources

Neighbouring land-use in the area surrounding the project area comprises predominantly of farming and mining activities. These land-uses contribute to baseline pollutant concentrations via the following sources:

- Existing mining operations comprising underground and opencast mining operations, stockpiles and tailings dams, an ore reduction facility and a sintering plant;
- Fugitive sources including vehicle entrainment of dust from local paved and unpaved roads, veld fires, wind erosion from open areas and dust generated by agricultural activities;
- Vehicle tailpipe emissions from public roads (minor source given relatively low vehicle activity rates in the region);
- Household fuel combustion (particularly wood and paraffin);
- Rail-related emissions with diesel locomotives being used to transport ore from mines in the area; and
- Regionally transported aged aerosols (particulates).

Potential receptors

Potential receptors could include the following:

- Residential settlements in the towns of Hotazel (located 13km to the north) and Black Rock (located 27km to the north west);
- Scattered farmsteads around the project area; and
- the natural environment.

6.4.1.4 Surface water

INTRODUCTION

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Mine-related activities have the potential to alter the drainage of surface water through the establishment of infrastructure and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste and mineralised wastes (waste rock stockpiles).

As a baseline, this section provides a brief description of surface water resources in the project area in order to facilitate an understanding of the hydrological catchments within which the mine is located and the status of surface water resources in the project area.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Regional hydrology

The project area is located in the Gamagara catchment of the Orange Basin which includes quaternary catchments D41J and D41K. The Mine is located in quaternary catchment D41K. Catchments identified in the project area include the Gamogara, Witleegte and Vlermuisleegte catchments.

The project area is drained by the Gamogara and two of its tributaries, namely the Witleegte and Vlermuisleegte. All three watercourses are non-perennial, ephemeral and highly seasonal.

Local hydrology

The Gamogara and Vlermuisleegte watercourses are situated about 7km to the west and south west, respectively, of the mine. The Witleegte forms the north eastern boundary of the UMK mining right area. The Witleegte and Vlermuisleegte both drain in a north westerly direction towards the Gamogara. The Gamogara then flows in a northerly direction and feeds into the Kuruman River approximately 15km downstream of the project site. The Gamogara is characterised by very gentle gradients and sandy soils, with the end result that only fairly heavy rain will induce any significant surface runoff.

Surface water quality

No surface water quality samples could be taken as there was no surface flow at the time of undertaking the study.

Surface water users

No reliable water use is possible from any of the watercourses (Gamogara, Witleegte, Vlermuisleegte) due to the highly seasonal river flow.

6.4.1.5 Groundwater

INTRODUCTION

Groundwater is a valuable resource and is defined as water which is located in cavities and fractures of rock formations in the lithosphere. Understanding the geology of the area provides a basis from which to understand the occurrence and distribution of groundwater resources. Project-related activities such as the expansion of the opencast mining areas, the handling, storage and disposal of mineralised and non-mineralised wastes, have the potential to impact on groundwater resources, both to the environment and third party users, through dewatering and pollution.

As a baseline, this section provides a brief description of the pre-mining groundwater conditions to facilitate an understanding of the potential for dewatering cones of depression and pollution plumes to occur as a result of project-related activities.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Local geohydrology

There are two aquifers present on the site. The first aquifer is the local calcrete aquifer which has a low groundwater potential. The second aquifer is the deeper banded iron formation (BIF) aquifer which has a high groundwater potential.

Aquifers in the project area have been classified according to Parsons (1995). The local BIF aquifer is considered to be a minor aquifer because the boreholes drilled into the aquifer yielded less than 2L/s during the aquifer tests. The quality of the water is however poor, with high nitrate and total dissolved solids concentrations. The upper layers of the calcrete are considered to be a **non aquifer** because of insignificant yields. As some farmers in the area rely entirely on borehole water for their water supply, the aquifers may be classed as sole source aquifers. However this will depend on the feasibility of obtaining alternative water from the Gamagara Water Scheme.

In the project area, the groundwater flows from south-west to north-east towards the Gamogara water course. The presence of the non-perennial Witleegte does not appear to have an influence on the water levels, as the water levels do not become shallower with the presence of the stream. This indicates that the stream is not fed by baseflow from the aquifer.

The average pre-mining ground water level at the mine site is approximately 25m below ground level. This is indicative of low rainfall in the area and highly permeable soils. Dewatering does take place on site. Water level data from the mine's ongoing groundwater monitoring programme will be included in the EIA and EMP.

Groundwater quality

Water quality sampling was undertaken by Metago as part of the project's hydrocensus in June 2006 and by AGES during the drilling of the site characterisation boreholes. Twelve hydrocensus boreholes and four site characterisation boreholes were sampled and analysed. The results, have been compared to DWAF's Water Quality classes for domestic use (1996) and the South African drinking water standard (SABS 0241 of 2001). DWAF's water quality classes are defined as Ideal (Class 0) to completely unacceptable (Class 4) which relates to the suitability of the water for domestic use and takes into account the health risk at certain concentrations. The SABS standard defines three classes of water, namely Class 0 (ideal drinking water), Class 1 (acceptable) and Class 2 (maximum allowable). The local, overall water quality is considered to be poor (Class 3) when compared to DWAF's water quality classes and not suitable for human drinking purposes. Water quality data from the mine's ongoing groundwater monitoring programme will be included in the EIA and EMP.

Groundwater users

Of the 20 boreholes identified during the hydrocensus, seven are in use for domestic, livestock and garden watering purposes. The remaining 13 boreholes are either monitoring boreholes used by Hotazel Mine (5) or prospecting boreholes (8). The hydrocensus survey indicated that the two neighbours who farm immediately adjacent to the project site rely entirely on groundwater for their water requirements. The only other available water source locally is the Gamagara Water Scheme. This groundwater use will be verified as part of the groundwater study for the project (see Section 7.3).

6.4.1.6 Soil and land capability

INTRODUCTION

Soil is an important natural resource and provides ecosystem services that are critical for life, such as:

- Water filtering;
- Providing growth medium for plants, which in turn provide food for plant-eating animals; and
- Providing habitat for a wide variety of life forms.

Soil forms rather slowly by the breaking down of rock material and is therefore viewed as a non-renewable resource. Soil determines the type of land use the area is suitable for, for example, soil with low nutrients may not be able to support unassisted crop farming.

Soil resources are vulnerable to pollution, erosion (wind and water) and compaction, which could be caused by project-related activities.

The baseline soil information will be used to identify sensitive soil types, to guide the project planning in order to avoid sensitive soil types where possible, to determine how best to conserve the soil resources in the area and allow for proper rehabilitation of the site once mining ceases.

The land capability of an area is based on the soil properties and related potential to support various land use activities. Mining operations have the potential to significantly transform the land capability.

A brief description of the soil types and land capability in the project area is provided below. More detailed information will be provided in the EIA and EMP.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Soils

The mine site is very homogeneous in terms of texture, structure and soil depth. The largest part of the site (94.1%) consists of deep (>1.5 metres) windblown sand of the Hutton soil form (**dHu**). The remaining area (5.9%) next to the dry stream in the north has sandy soils of the Plooyburg form (**mPy**).

Parts of the project area have been transformed through current mining activities.

Land Capability

The land capability of the project area is considered to be of low agricultural potential due to the low clay content of the soils and the low rainfall. The land is only suited for grazing. Parts of the project area have been transformed through current mining activities.

6.4.1.7 Biodiversity

INTRODUCTION

Biodiversity refers to the flora (plants) and fauna (animals). According to the International Union for Conservation of Nature (IUCN) (2011), biodiversity is crucial for the functioning of ecosystems which provide us with products and services which sustain human life. Healthy ecosystems provide us with oxygen, food, fresh water, fertile soil, medicines, shelter, protection from storms and floods, stable climate and recreation.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

The project area falls within the Kalahari Plains Thorn Bushveld. The area is characterised by flat sandy plains and consists of a mixture of vegetation types that have undergone various changes due to grazing and past mining activities. Low rainfall in the area has also influenced the structure of this vegetation.

This vegetation has a fairly well-developed tree stratum and a moderately developed shrub layer. The grass cover depends on the amount of rainfall during the growing season. Only 0.47% of this vegetation type is conserved in nature reserves and approximately 55% has been transformed by agriculture.

Habitat/vegetation types identified within the project area are listed below.

- *Vachellia haematoxylon* Savannah;
- *Vachellia mellifera* Mixed Woodland;
- *Vachellia erioloba* Savannah;
- *Schmidtia kalihariensis*-*Prosopis glandulosa* Shrubland;
- *Tarchonanthus camphorates*-*Schmidtia pappophoroides* Scrub; and
- Secondary vegetation (due to previous disturbance).

A few of the dominant tree species present within these habitats includes *Vachellia erioloba*, *V. haematoxylon* and *Boscia albitrunca* which are protected in terms of the National Forests Act of 1998.

Due to farming practises and past mining activity the faunal population of the project site has been disturbed.

Based on the bird species identified on-site, the project site hosts both grassland and bushveld bird species. Grassland species observed included, the Northern Black Korhaan and the Longbilled lark while species that prefer bush or scrub included, the Grey hornbill, Chat Flycatcher and Clapper lark. Red data bird species that are likely to occur within the project area include the Martial Eagle, Secretary bird and the Ludwig's Bustard.

The loose sandy soils which occurs over a large portion of the study site, makes these areas suitable for burrowing mammals. Species such as Suricate, White-tailed Mongoose, Molerat, and ground squirrels were observed on site. Red data mammal species likely to occur include the Honey badger, the South African hedgehog, the Dent's horseshoe bat and Schreiber's long-fingered bat.

Protected Species and Sensitive Areas

The *Vachellia haematoxylon* Savannah, *Vachellia mellifera* woodlands and watercourses in the project area can be classed as sensitive ecological environments.

Vachellia haematoxylon is classified as a protected species, and has a narrow distribution range. The *V. haematoxylon* woodlands in the area around Kuruman are not well conserved and are under threat from activities such as mining. Although no Red Data floral species occur within the project area the habitat structure and species composition within these areas were found to be suitable for a number of Red Data faunal species.

When considering the *Vachellia mellifera* woodlands, although these areas have been disturbed to some degree through over utilisation and past mining and prospecting activities, they have conservation value and contain protected plant species and potentially suitable habitats for Red Data faunal species. Conversely, it must be noted that from a livestock farming perspective, this species is an intruder species that over runs grazing land at a significant cost to farmers.

With regards to watercourses, they are expected to support a unique ecosystem even though the drainage lines are non-perennial. Adequate buffer zones should be established to prevent any disturbances along the edge of these water systems. It must however be noted that the Witteleege at present is severely degraded.

6.4.1.8 Socio-economic

INTRODUCTION

Mines and related projects have the potential to result in both positive and negative socio-economic impacts. The positive impacts are usually economic in nature with mines contributing directly towards employment, procurement, skills development and taxes on a local, regional and national scale. In addition, mines indirectly contribute to economic growth in the local and regional economies because the increase in the number of income earning people has a multiplying effect on the trade of other goods and services in other sectors.

The negative impacts can be both social and economic in nature. In this regard, mines can cause:-

- Influx of people seeking job opportunities which can lead to increased pressure on basic infrastructure and services (housing, health, sanitation and education), informal settlement development, increased crime, introduction of diseases and disruption to the existing social structures within established communities; and
- A change to not only pre-existing land uses, but also the associated social structure and meaning associated with these land uses and way of life.

To understand the basis of these potential impacts, a baseline situational analysis is described below.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Population

The John Taolo Gaetsewe District Municipality (JTGDM) has under its jurisdiction the Gamagara, Ga-Segonyana and the Joe Morolong local municipalities. The main town in this district is Kuruman, where the district has its office.

Basic services

The recent historic situation was that the overall demand for formal housing in the area was low as less than 1.5% of the households throughout the area reside in sub-RDP housing. Over a period of 5 years the proportion of households occupying formal housing structures decreased while the informal category increased. This increase could however be linked to the growth in the overall population and the national trend in the household sizes declining. Compared to the district, the increase is significantly lower than the expansion of informal settlements.

A total of 97.8% of the households occupied “formal dwelling units”. While the percentage implies that the overall backlog for housing is relatively low, the provision of housing is a critical concern as the right to housing is encapsulated in the South African Constitution. Although the proportional occurrence of the informal housing is low in the surrounding area, relatively high percentages of households live in the informal housing structures.

The current situation experienced by new mining developments and expansions is that there is a shortage of formal housing.

Education

The type of education received in the district and local municipality areas varies from no schooling to a higher degree. Gamagara local municipality area has the lowest statistics for every educational category. Of the three municipalities Joe Morolong local municipality area shows a higher percentage of those without education (56%) and those with only a primary school education (55%) and Ga-Segonyana local municipality area shows a greater percentage of secondary (51%) and higher education learners (46%). Tertiary education degrees were more predominant in the Ga-Segonayana local municipality area with 61% of those with higher degrees coming from this area. Ga-Segonyana is the only local municipality area with accessible tertiary institutions.

6.4.1.9 Topography

INTRODUCTION

The topography of a particular area will determine the following factors:

- The flow of surface water, and in many cases, also groundwater;
- The depth of soils and the potential for soil erosion, for example, in the case of steep slopes soils are shallower and more prone to erosion;
- The type of land use, for example flat plains are more conducive to crop farming;
- The aesthetic appearance of the area; and
- Topography can also influence climatic factors such as wind speeds and direction, for example, wind will be channelled in between mountains and along valleys.

Changes in the topography caused by the mining activities could therefore alter all of the above-mentioned aspects of the environment. Project-related activities have the potential to alter the topography of the site through the establishment of infrastructure.

This section provides a brief description of the site topography to facilitate an understanding of the topographical features relevant to the project site and surrounding area from which to measure potential change. More detailed information will be provided in the EIA and EMP report.

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

The project site is relatively flat with a gentle slope towards the north west. The elevation within the mining right area varies from 1100m to 1040m above mean sea level (m amsl). The highest topographical features (koppies and ridges) in the vicinity of the mine are the Korannasberg, approximately 13.75km west of the site, and the Kurumanheuwels, approximately 10km south east of the site.

The project area is bordered by two non-perennial drainage lines, namely the Witleegte (along the north eastern boundary) and the Gamogara (along the north western boundary). The Witleegte joins the Gamogara just past the northern most corner of the project area. To the west of the project site, lie several dry pans.

6.4.1.10 Visual Aspects

INTRODUCTION

Mining projects have the potential to alter the landscape character of an area through the establishment of both temporary and permanent infrastructure. As a baseline, this section provides an understanding of the pre-project visual character of the project area against which to measure potential change as a result of project infrastructure and activities. More detailed information will be provided in the EIA and EMP.

DATA SOURCE

Information in this section was sourced from available baseline information.

RESULTS

The project site is located within the flat open plains of the Kalahari. The site is rural in nature in that it is sparsely populated with farmhouses scattered throughout the area. The main land use in the area is game and cattle farming. The project site is located within an area known as the manganese belt and as such the sense of place and natural visual character of the area has been altered by the presence of mining operations.

The mine is visible to the naked eye from the R380 road between Kathu and Hotazel. The R380 is directly adjacent and to the east of the site. From higher vantage points such as the Kurumanheuwels and the Korannasberg, the mine may be visible. The mine is however be visible to people travelling along sections of the main roads (surfaced and gravel) that border the project area. The mine is also visible to residents and workers on adjacent farms and mines.

6.4.1.11 Noise

INTRODUCTION

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

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Existing sources of noise include mining operations, localised traffic and trains, farming activities and natural sounds.

To determine pre-mining noise levels, noise measurements were taken at two potentially sensitive sampling points in the project area, namely at the Perth farmhouse (MP1) and the Steyn farmhouse (MP2), over a 24-hour period. Based on the measured results, ambient noise levels varied from 39dBa during the day (06h00 to 22h00) to 33 dBa at night (22h00 to 06h00) which is typical for a rural areas.

6.4.1.12 Heritage/cultural and palaeontological resources

INTRODUCTION

This section describes the existing status of the heritage and cultural environment that may be affected by the project. Heritage (and cultural) resources include all human-made phenomena and intangible products that are the result of the human mind. Natural, technological or industrial features may also be part of heritage resources as places that have made an outstanding contribution to the cultures, traditions and lifestyles of the people or groups of people of South Africa.

Paleontological resources are fossils, the remains or traces of prehistoric life preserved in the geological (rock stratigraphic) record. They range from the well-known and well publicised (such as dinosaur and mammoth bones) to the more obscure but nevertheless scientifically important fossils (such as palaeobotanical remains, trace fossils, and microfossils). Paleontological resources include the casts or impressions of ancient animals and plants, their trace remains (for example, burrows and trackways),

microfossils (for example, fossil pollen, ostracodes, and diatoms), and unmineralised remains (for example, bones of Ice Age mammals).

DATA SOURCES

Information in this section was sourced from available baseline information.

RESULTS

Heritage resources identified in the project area are listed below:

- Remains of mining activities relating to the Perth and Smartt manganese mines.
- Occurrences of stone tools dating from the Middle to Late Stone Ages.

The mining remains can be considered to be of low importance or insignificant as the remains do not possess any uncommon, rare or endangered aspects of South Africa's natural or cultural heritage; do not have the potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage; do not have any importance in demonstrating a high degree of creative or technical achievement at a particular period; and are not yet 60 years old.

The Stone Age occurrences to the north and northwest of the project area have a medium to high significance but are not expected to be affected by the project.

The findings of the desktop palaeontological review will be included in the EIA and EMP report. Fossil resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval.

6.4.2 CURRENT LAND USES

INTRODUCTION

Mining projects have the potential to affect land uses both on the project site and in the surrounding areas. This can be caused by physical land transformation and/or through direct or secondary impacts.

To understand the basis of the potential land use impacts, a brief baseline situational analysis is described below. More detailed information will be provided in the EIA and EMP.

DATA SOURCE

Information in this section was sourced from available baseline information.

RESULTS

Mineral/prospecting rights

UMK holds the mining rights (NC 30/5/1/2/3/2/1(113) MR) on the farm portions outlined in Table 6-4 below.

Existing environmental authorisations in terms of NEMA

UMK holds an environmental authorisation (NC/KGA/HOT7/15/2006) in terms of NEMA on the farm portions outlined in Table 6-4 below.

Landowners within the project area

Landowners located within the project area are outlined in Table 6-4 below. There are also various servitudes (including a power line and roads) throughout the study area.

TABLE 6-4: LANDOWNERS LOCATED WITHIN THE PROJECT AREA

RELEVANT FARMS	RELEVANT PORTION	LANDOWNER
Rissik 330	Portion 1 (Eastern portion)	Mrs Theresia Steyn
	Portion 1 (Western portion)	South 32
Rissik 330	Remaining extent (RE) (Eastern portion)	Mrs Theresia Steyn – Gideon Poolman Familie Trust
	RE (Western portion)	South 32
Rissik 330	Portion 2	Transnet
Rissik 330	Portion 3	UMK Mine
Smartt 314	RE	Terra Nominees (Pty) Ltd
Smartt 314	Portion 1	Transnet
Botha 313	The farm	Terra Nominees (Pty) Ltd

Surrounding mining companies

Existing mining operations in the area include: Assmang's Nchwaning and Gloria Mines; South 32's Wessels and Mamatwan Mines; Ntsimbintle Mining's Tshipi Borwa Mine; Kudumane Manganese Resources' Kudumane Mine; and Arcelor Mittal and Kalagadi Manganese's Kgalagadi Mine. N'Chwaning, Gloria and Wessels Mines are exclusively underground operations while opencast activities are practised at Mamatwan Mine. Mamatwan Mine is located immediately south of UMK Mine. Mamatwan is the only mine that has an on-site sintering plant. In addition, there is an ore reduction facility next to N'Chwaning mine that is owned by Delta Electrical Industries Ltd.

Agriculture and associated farmsteads

There are several private farmhouses scattered along the D3340, R380 and the gravel road between Dibeng and the R31. The closest neighbours to the UMK Mine are:

- the Perth farmhouse (not permanently occupied) and the labourers dwellings on the farm Perth 276 located approximately 1km from the nearest opencast operation; and

- the Steyn farmhouse on the remaining extent of the farm Rissik 330, located approximately 2 km east of the site boundary.

Regional powerline infrastructure

Two Eskom power lines (and the associated Eskom servitudes) occur in the project area. The first line enters the project site from the north and then traverses the centre of the project area in a southwesterly direction. This line supplied power to the old Middelplaats Mine on the farm Middelplaats 332. The second line cuts across the north eastern corner of the project site on the farm Smartt 314.

Local Road Network

Existing roads within the vicinity of the UMK Mine include:

- The R380 provincial tar road directly adjacent and to the east of UMK Mine;
- The D3340 gravel road along the north eastern boundary of the project area;
- A gravel road along the north western boundary of the project area between Dibeng and the R31; and
- Gravel roads and several dirt tracks within the project boundary.

Land claims

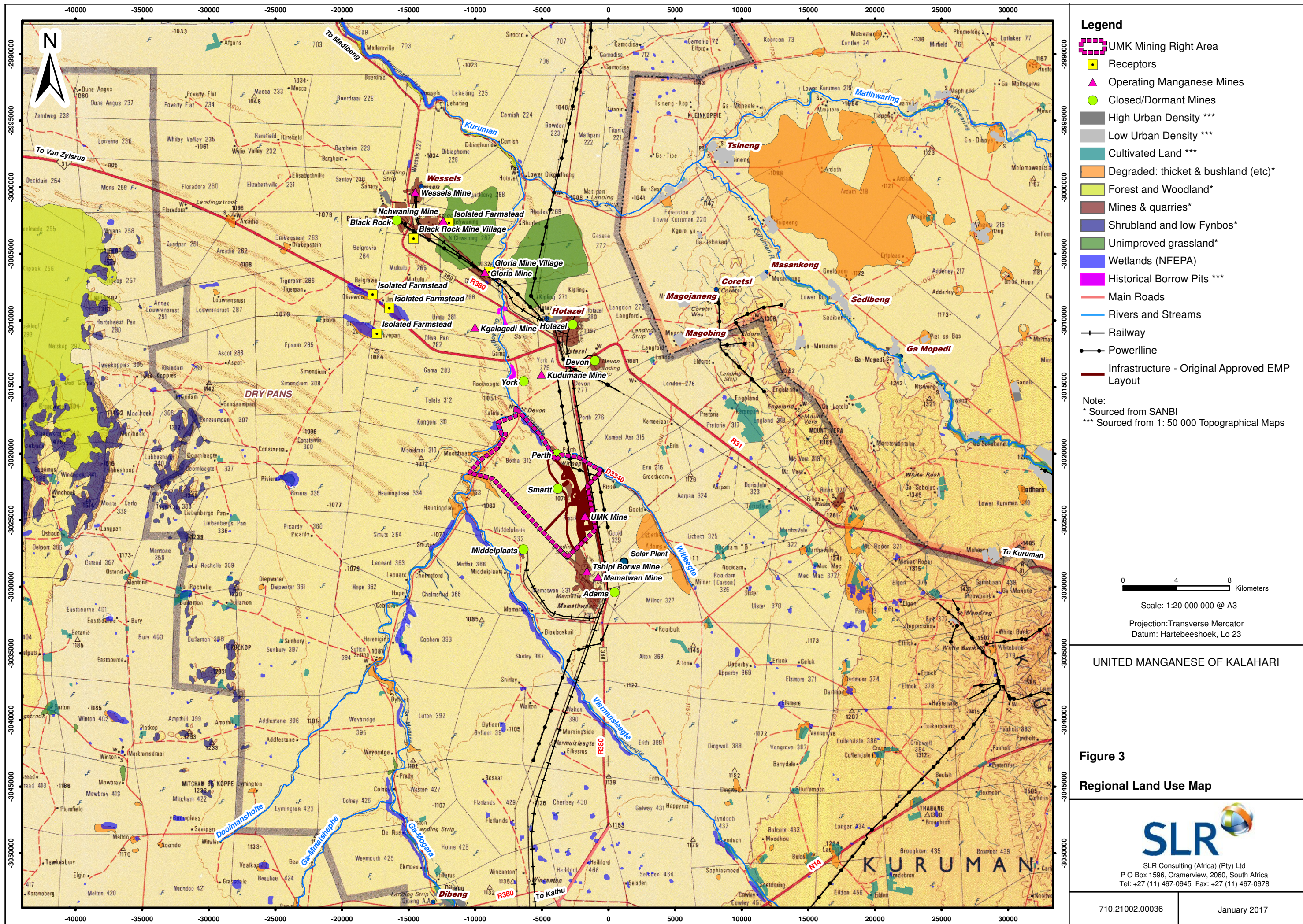
As part of the project's public consultation process, the Department of Rural Development and Land Reform: Land Claim Commissioner was contacted to confirm if any land claims have been lodged on any of the farms located within the project area. To date no feedback has been received from the land claim commissioner.

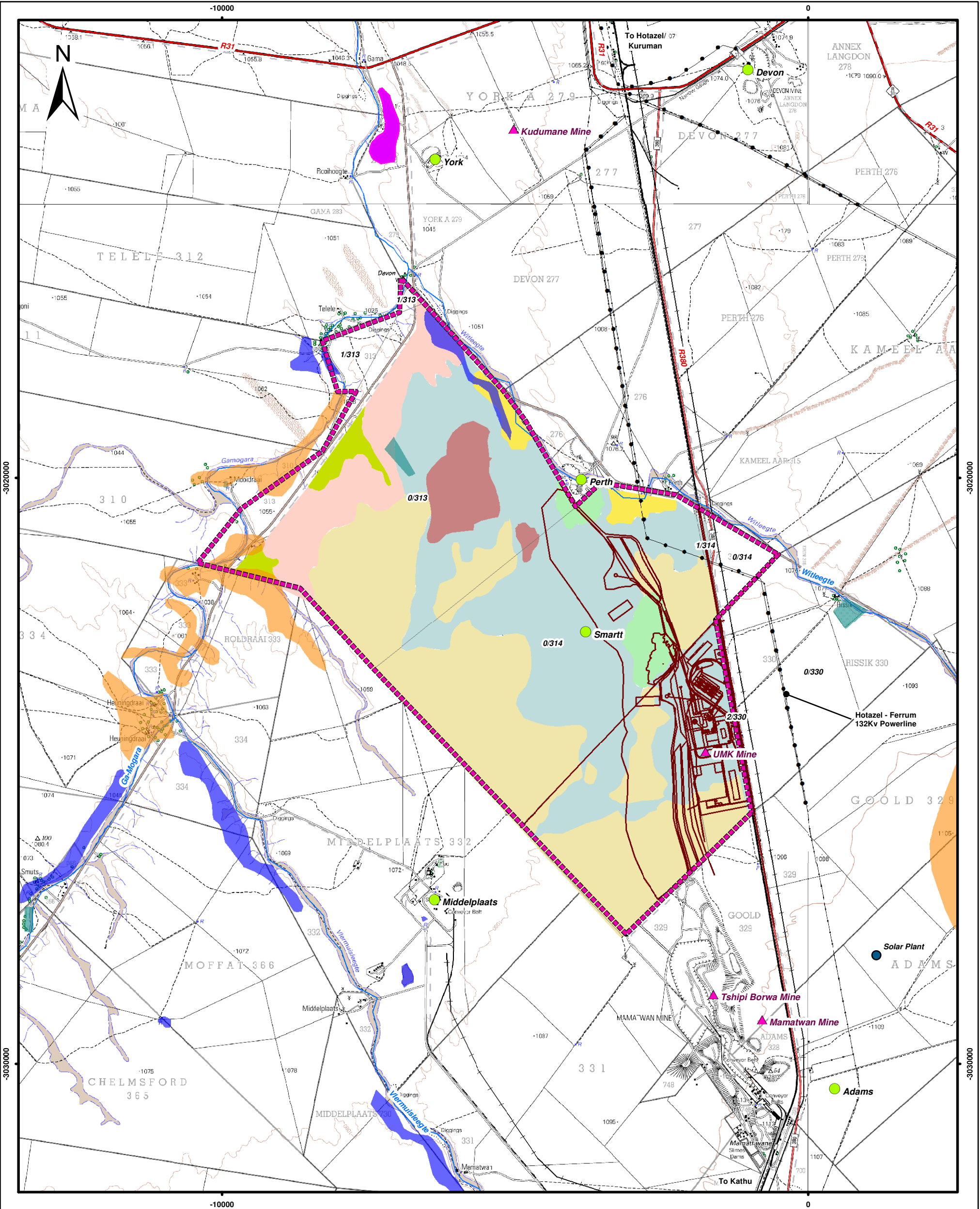
6.4.3 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

The environmental features in the project area are described in Section 6.4.1 above, however the notable environmental feature is the Witleegte Spruit on the north-eastern boundary, and the Gamogara River on the north-western boundary of the UMK Mine. Infrastructure within and close to the project area is discussed in Section 6.4.2 above. The notable infrastructure within the project area is the Eskom power line that traverses the project site in a northeasterly-southwesterly direction.

6.4.4 ENVIRONMENT AND CURRENT LAND USE MAP

A conceptual map showing topographical information as well as land uses on and immediately surrounding the project area is provided in Figure 3 and Figure 4. This may be refined during the EIA and EMP Phase.





Legend

- UMK Mining Right Area
- Operating Manganese Mines
- Closed/Dormant Mines
- Cultivated Land *
- Degraded: thicket & bushland (etc) *
- Wetlands (NFEPA)
- Historical Borrow Pits ***
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Railway

Vegetation Types

- Acacia Eriوبا Savannah
- Acacia Haematotoxylon Savannah
- Acacia Mellifera - Mixed Woodland
- Schmidtia Kalihariensis Prosopis - Glandulosa Shrubland
- Secondary Vegetation
- Tarchonathus Camphoratus - Acacia Karroo Scrub
- Tarchonathus Camphoratus - Schmidtia Pappophoroides Scrub
- Infrastructure - Original Approved EMP Layout

Note:
* Sourced from SANBI
*** Sourced from 1: 50 000 Topographical Maps

0 1 000 2 000 Meters
Scale: 1:62 500 @ A3
Projection: Transverse Mercator
Datum: WGS1984, Lo23

UNITED MANGANESE OF KALAHARI

Figure 4
Local Land Use



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6.5 IMPACTS IDENTIFIED

This section provides a list of potential impacts on environmental and socio-economic aspects that have been identified in respect of each of the main project actions/activities and processes for each of the project phases (Table 6-5). A discussion of each of the impacts identified is provided in Section 6.7. The preliminary ratings for consequence, probability and significance of each of the impacts in the **unmitigated scenario** (which assumes that no consideration is given to the prevention or reduction of environmental and social impacts) are also provided in the table below in accordance with the DMR report template. In this regard it must be noted that a conservative approach has been applied to these ratings in the absence of site specific studies. Once all the site specific studies have been completed the assessment and related ratings may change. The final ratings will be included in the EIA and EMP report.

TABLE 6-5: PRELIMINARY LIST OF POTENTIAL IMPACTS IDENTIFIED FOR THE PROJECT

Note: The preliminary assessment ratings provided in this table are for the unmitigated scenario only which assumes that no consideration is given to the prevention or reduction of environmental and social impacts. Furthermore, a conservative approach has been applied to these ratings in the absence of site specific studies. Once all the site specific studies have been completed the assessment and related ratings may change. Moreover, once the mitigation/management measures have been incorporated into the assessment as part of the EIA and EMP a determination of residual impact will be provided. The final ratings will be included in the EIA and EMP report.

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
Hazardous excavations and infrastructure that can be harmful to people and animals	Site preparation Earthworks Civil Works Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Support services Demolition Maintenance and aftercare	None	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
	Physical destruction of biodiversity			H	H	M	H	H	Partially		

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Support services General site management Demolition Rehabilitation Maintenance and aftercare										
General disturbance of biodiversity	Site preparation Earthworks Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	None		M	H	M	H	H	Partially		
Pollution from emissions to air	Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport systems	None		H	H	M	H	H	Fully		

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Power supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare										
Increase in disturbing noise levels	Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services Demolition Rehabilitation	None		H	H	M	H	M	Fully	Unlikely	
Negative visual impacts	Site preparation Earthworks Civil works	None		M	H	M	L	M	Fully		

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management. Demolition Rehabilitation Maintenance and aftercare										
Loss of or damage to heritage and/or palaeontological resources	Site preparation Earthworks Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition	None		M	H	L	M	M	Partially	Possible	Can be avoided

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Rehabilitation Maintenance and aftercare										
Positive socio – economic impacts (Economic impact)	Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	None		H ⁺	H	H	H	H ⁺	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)	Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use	None		H	H	M	L	M	Fully		

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare										
Change in land use	Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	None		H	H	M	H	H	Fully		
Loss of soil resources and land	Earthworks	None	Construction	H	H	M	H	H	Fully	Possible	Can be managed/mitigated

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
capability through pollution	Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare		Operation Decommissioning								to acceptable levels
Loss of soil resources and land capability through physical disturbance	Earthworks Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition	None		H	H	L	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Rehabilitation Maintenance and aftercare										
Contamination of surface water resources	Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	None		H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure)	Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste	None		M	H	M	H	H	Fully		

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
	Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare										
Contamination of groundwater resources	Earthworks Civil works Open pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	None		H	H	M	H	H	Fully		
Hazardous excavations, surface subsidence and infrastructure	Open pit mining Rehabilitation	None		H	H	M	H	H	Fully		Can be managed/mitigated to acceptable levels

Potential impact	Activity	Alternative	Project phases	Consequence			Probability	Significance	Degree to which impact can:		
				Severity	Duration	Spatial scale			be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
that can be harmful to people and animals											
Reducing groundwater levels and availability (Pit dewatering)	Open pit mining	None	Operation	H	M	M	M	H	Fully	Possible	
Blasting related impacts (Air blasts, ground vibration and fly rock)	Open pit mining	None	Operational	H	H	H	M	H	Fully	Possible	
Disturbance of roads by project related traffic	Transport systems	None	Construction Operation Decommissioning	H	H	M	M	H	Fully		
Loss and sterilization of mineral resources	Open pit mining Mineralised waste	None		H	H	M	H	H	Fully		

6.6 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The proposed method for the assessment of environmental issues is set out in Table 6-6. This assessment methodology enables the assessment of environmental issues including: cumulative impacts, the severity of impacts (including the nature of impacts and the degree to which impacts may cause irreplaceable loss of resources), the extent of the impacts, the duration and reversibility of impacts, the probability of the impact occurring, and the degree to which the impacts can be mitigated.

TABLE 6-6: IMPACT ASSESSMENT METHODOLOGY APPLIED IN SCOPING

Note: Part A provides the definition for determining impact consequence (combining intensity, spatial scale and duration) and impact significance (the overall rating of the impact). Impact consequence and significance are determined from Part B and C. The interpretation of the impact significance is given in Part D.

PART A: DEFINITION AND CRITERIA*					
Definition of SIGNIFICANCE		Significance = consequence x probability			
Definition of CONSEQUENCE		Consequence is a function of severity, spatial extent and duration			
Criteria for ranking of the SEVERITY of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action.			
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints.			
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.			
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.			
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.			
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.			
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term			
	M	Reversible over time. Life of the project. Medium term			
	H	Permanent. Beyond closure. Long term.			
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.			
	M	Fairly widespread – Beyond the site boundary. Local			
	H	Widespread – Far beyond site boundary. Regional/ national			
PART B: DETERMINING CONSEQUENCE					
SEVERITY = L					
DURATION	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium
SEVERITY = M					
DURATION	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium
SEVERITY = H					
DURATION	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High

	Short term	L	Medium	Medium	High
			L	M	H
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
SPATIAL SCALE					
PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M= medium and L= low and + denotes a positive impact.

6.7 THE POSITIVE AND NEGATIVE IMPACTS THAT THE ACTIVITY AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED

Potential impacts that were identified during the scoping process, in consultation with IAPs, are discussed under environmental component headings in this section. These discussions should be read with the corresponding descriptions of the baseline environment in Section 6.4.1 of the scoping report.

The potential impacts associated with all the phases (construction, operations, decommissioning and closure) have been identified and described and reference has been made to the studies/investigations that are required to provide the necessary additional information. **In the absence of site specific studies the assessment conclusions are conservative. It follows that the assessment provided below is a preliminary assessment which will be refined/changed in the EIA and EMP report with specialist input, as appropriate.**

The preliminary assessment considers a cumulative on-site scenario where the approved operations are considered together with changes to infrastructure, design and layout that have/will take place on site as well as the expansion of the mining operations.

With reference to Section 6.1, no alternatives are being considered or assessed as part of the project.

6.7.1 GEOLOGY

ISSUE: LOSS AND STERILIZATION OF MINERAL RESOURCES

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

By the nature of mining projects the geology is exploited for the target minerals therefore the impact on the geology will be high in all project phases. It is also possible that mineral resources can become sterilised through the placement of surface infrastructure. Most of these activities already take place on site; changes to the mining operations have the potential to present additional sources.

The severity in the unmitigated scenario is expected to be high and can be reduced to low in the mitigated scenario with planning and co-ordination to help prevent the unacceptable sterilization of resources. If sterilization of resources occurs it is likely that the related impact will not extend beyond the life of mine. The physical impact is linked to the spatial extent of the project area. This is a localised spatial extent, however when one considers the economic nature of the impact, it will extend beyond the site into the broader economy. The significance of the impact is high in the unmitigated scenario and could be reduced to low with mitigation. This assessment applies to both site layout alternatives.

6.7.2 AIR QUALITY

ISSUE: POLLUTION FROM EMISSIONS TO AIR

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining projects present a number of air pollution sources that can have a negative impact on ambient air quality and surrounding land uses in all phases. Pollution sources include land clearing activities, materials handling, wind erosion from stockpiles, wind erosion of disturbed areas, vehicle movement along unpaved roads, dust generation from crushing and screening plants and gas emissions mainly from vehicles and generators. Most of these activities already take place on site; changes to the mining operations have the potential to present additional sources. The main contaminants include inhalable particulate matter less than 10 microns in size (PM₁₀), larger total suspended particulates (TSP) that relate to dust fallout and the manganese fraction of the PM₁₀. These emissions could have a negative impact on ambient air quality and could result in health impacts for nearby sensitive receptors if unmanaged. This is a high severity in the unmitigated scenario and can be reduced with measures to reduce emissions. Without mitigation the duration of the impacts could extend beyond closure. With mitigation, the duration of impacts will be limited to the phase prior to closure. The spatial scale of the

potential impact extends off site in both the mitigated and unmitigated scenarios. The significance of this impact is high in the unmitigated scenario and can be reduced with mitigation.

The additional work required to address this issue is described in Section 7.3.1 of this scoping report.

6.7.3 SURFACE WATER

ISSUE: ALTERATION OF NATURAL DRAINAGE PATTERNS (LOSS FROM CONTAINMENT INFRASTRUCTURE)

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Pre-mining natural drainage across the project area is via sheet flow and/or preferential flow paths (drainage lines). No mine infrastructure or expansion activities will be located within 100m from the Witteegte drainage channel. Rainfall and surface water run-off are collected in areas that have been designed with water containment infrastructure as required by legislation. In order to comply with legislation for water containment infrastructure as part of the mine expansion, additional stormwater management is needed. For the expansion of the project The collected run-off will therefore be lost to the catchment and can result in the alteration of drainage patterns. During the construction, operational and decommissioning phase, these activities will continue until such time as mine infrastructure can be removed and/or the project areas are rehabilitated. During the closure phase, rehabilitation will allow for the restoration of drainage patterns and surface run-off as far as possible. In areas with residual open pits or partially backfilled pits, the change in surface runoff would remain post closure.

When considering the loss of run-off to the catchment as a result of containment infrastructure, the severity of the impact could be high in the unmitigated scenario and depends on the amount of run-off lost from the catchment. This can be reduced to medium with mitigation measures. With and without mitigation, drainage patterns would continue to be impacted upon post-closure and this is a high duration. In the mitigated and unmitigated scenario the physical alteration of drainage patterns will extend beyond the site boundary as flow reduction impacts could extend further downstream. The significance is high in the unmitigated scenario as the probability of the alteration of drainage patterns is definite without mitigation. With mitigation, the re-establishment of run-off patterns reduces the significance of this impact to medium.

The additional work required to address this issue is described in Section 7.3.2 of this scoping report.

ISSUE: CONTAMINATION OF SURFACE WATER RESOURCES

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mines generally present a number of pollution sources that can have a negative impact on surface water quality if unmanaged in all project phases. The following pollution sources exist: fuel and lubricants, sewage, mine residue (waste rock stockpiles), dirty water circuit, chemicals, non-mineralised waste (hazardous, general), and erosion of particles from exposed soils in the form of suspended solids. Changes to operations at the mine have the potential to add to these sources.

In the unmitigated scenario the severity is high and can be reduced to medium with mitigation measures focussed on diverting clean water away from the project area and containing contaminated run-off and process water for re-use. In the unmitigated scenario pollution events can extend beyond the LOM. With mitigation, pollution events can be prevented or mitigated to occur within the LOM. In the unmitigated and mitigated scenario a pollution event can extend beyond the site boundary. The significance in the unmitigated scenario is high and can be reduced to moderate/low with mitigation.

The additional work required to address this issue is described in Section 7.3.2 of this scoping report.

6.7.4 GROUNDWATER

ISSUE: REDUCING GROUNDWATER LEVELS AND AVAILABILITY (PIT DEWATERING)

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

Groundwater levels could be reduced through the dewatering of the open pit during the operational phase and will cease once the open pit has been mined out. Dewatering activities currently take place on site after heavy rain. If the abstraction of groundwater within the project area causes a temporary reduction or loss of water to third party users, this is a high severity in the unmitigated scenario. With mitigation this can be reduced to low. The duration of the impact is linked to the duration of the activity which is expected to be for the life of the project. If the reduction of groundwater levels influences third party users the impact will extend beyond the site boundary. In the unmitigated scenario the significance of this impact is high and can be reduced to low with mitigation.

The additional work required to address this issue is described in Section 7.3.3 of this scoping report.

ISSUE: CONTAMINATION OF GROUNDWATER RESOURCES

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mines generally present a number of pollution sources that can have a negative impact on groundwater quality if unmanaged in all project phases. Changes to operations at the mine have the potential to add to these sources. Groundwater could become contaminated through the incorrect stockpiling of potentially polluting waste materials on the site during the construction and decommissioning of infrastructure. Possible sources of groundwater contamination during the operational phase include seepage from accidental spills and leaks, seepage from blasting residues and exposure of groundwater to exposed rock and seepage from the waste rock and other stockpiles. During operation, decommissioning and closure there is also a potential for groundwater resources to be contaminated from backfilling the open pit with waste rock. Of key concern to groundwater quality is seepage from mineralised waste material contained in a WRD. This is a high severity in the unmitigated scenario and can be reduced to medium with pollution prevention and/or mitigation measures. In the unmitigated scenario, groundwater contamination is long term in nature. With mitigation the impact can be limited to the life of the project. In both the unmitigated and mitigated scenarios, groundwater pollution is likely to extend beyond the site boundary. The significance is high in the unmitigated scenario and can be reduced to medium/low with mitigation.

The additional work required to address this issue is described in Section 7.3.3 of this scoping report.

6.7.5 SOILS AND LAND CAPABILITY

ISSUE: LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH POLLUTION

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mines generally present a number of pollution sources that can have a negative impact on groundwater quality if unmanaged in all project phases. Changes to operations at the mine have the potential to add to these resources. Soil is a valuable resource that supports a variety of ecological functions. Mining projects in general have the potential to damage soil resources through contamination. A loss of soil resources would result in a decrease in the natural rehabilitation and future land use potential. There are a number of sources in all phases that have the potential to pollute soil resources.

The overall severity in the unmitigated scenario is expected to be high and reduces to low in the mitigated scenario as the number of sources and number of pollution events should be significantly less. Most pollution impacts and associated loss in land capability will remain long after closure. In the mitigated scenario most of these potential impacts should either be avoided or be remedied immediately which reduces the duration to less than the life of the mine. The potential loss of soil resources and associated land capability will extend beyond the site boundary without mitigation. With mitigation, the potential loss

of soil resources and associated land capabilities will be restricted to within the site boundary. The significance of this impact is high in the unmitigated scenario and can be reduced to low with mitigation.

The additional work required to address this issue is described in Section 7.3.4 of this scoping report.

ISSUE: LOSS OF SOIL RESOURCES AND LAND CAPABILITY THROUGH PHYSICAL DISTURBANCE

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Soil is the key to re-establishing post closure land capability. Soil resources can be disturbed through removal, erosion and compaction which can result in a loss of soil functionality as an ecological driver. There are a number of activities/infrastructure in all phases that have the potential to disturb soils and related land capability. Some stripping and stockpiling of soil resources has taken place on site to support the establishment of the mine. Changes to the operations will require the disturbance of an additional footprint.

In the unmitigated scenario the severity is high as soils will be lost to the area of disturbance, soil functionality will be compromised and soils are likely to erode. The loss of soil and related land capability is long term and will continue after the life of the mine. The duration of this impact can be reduced to medium with mitigation as most of the soil can be conserved and used for rehabilitation. The potential loss of soil and land capability through physical disturbance will be restricted to within the site boundary. The significance of this impact is high in the unmitigated scenario and can be reduced to low with mitigation.

The additional work required to address this issue is described in Section 7.3.4 of this scoping report.

6.7.6 BIODIVERSITY

ISSUE: PHYSICAL DESTRUCTION OF BIODIVERSITY

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Parts of the project area have been transformed to support the establishment of the mine. The placement of project infrastructure and activities in all phases has the potential to contribute to this transformation if not managed. Typically project activities destroy biodiversity through the physical destruction of specific biodiversity areas, of linkages between biodiversity areas and related species which are considered to be

significant because of their status, and/or the role that they play in the ecosystem. No mining or project activities and infrastructure will be located within aquatic ecosystems.

The project will require the removal of protected species such as the *Vachellia erioloba* (Camel Thorn), *Vachellia haematoxylon* (Grey Camel Thorn).

Taking the above into consideration, the severity is high in the unmitigated scenario. In the mitigated scenario, with correct management and con-current rehabilitation the severity reduces to medium until closure and possibly to low thereafter. The loss of biodiversity and related functionality is long term and will continue after the life of the project. In the mitigated scenario, biodiversity may be partially restored during the operational, decommissioning and closure phases. The duration is therefore high in the unmitigated scenario, reducing to medium in the mitigated scenario. Biodiversity processes are not confined to the project area and as such the spatial scale will extend beyond this boundary with and without mitigation. The significance is high without mitigation as the probability of the impact is definite. The significance can be reduced to medium with correct management measures and con-current rehabilitation and can be further reduced to low at closure with emphasis placed on restoring disturbed areas.

The additional work required to address this issue is described in Section 7.3.5 of this scoping report.

ISSUE: GENERAL DISTURBANCE OF BIODIVERSITY

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining infrastructure and activities take place on site. Changes to the operations have the potential to directly disturb vegetation, vertebrates and invertebrates in all project phases.

Biodiversity can be disturbed by anthropogenic activities such as killing of fauna, illegal removal of fauna and flora species, settlement of dust on vegetation, generation of noise that may scare off vertebrates and invertebrates, road kills, general litter and establishment of fires. This is a medium severity in the unmitigated scenario and can be reduced to low in the mitigated scenario with measures focussed on preventing or mitigating the impact to acceptable levels. In the unmitigated scenario, the impacts are long term because this impact is likely to exist beyond the LOM. With mitigation the impacts should not extend post closure. Biodiversity processes are not confined to the project area and as such the spatial scale of impacts will extend beyond the site boundary in the unmitigated and mitigated scenarios. In the unmitigated scenario, the significance of this potential impact is high as the probability is definite. In the mitigated scenario, the significance is reduced to medium with a reduction in the probability of the impact.

The additional work required to address this issue is described in Section 7.3.5 of this scoping report.

6.7.7 SOCIO-ECONOMIC ISSUES

ISSUE: POSITIVE SOCIO-ECONOMIC IMPACTS (ECONOMIC IMPACT)

The promise of further development and the very presence of the mine will result in both positive and negative socio-economic impacts.

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

All activities associated with the mine will have positive socio-economic impacts in all phases. Changes to the operations have the potential to contribute to a continued positive economic impact on the local, regional and national economies. Direct benefits would be derived from wages, taxes and profits. Indirect benefits through the procurement of goods and services, and the increased spending power of employees. The severity in both the unmitigated and mitigated scenario is a high positive. After closure there may still be some positive impacts through maintenance and aftercare activities and from the economic momentum associated with the operational phase of the mine. In both the mitigated and unmitigated scenarios, the spatial scale of the impact is high because it will extend far beyond the project area on a regional and national scale. The significance of the impact in both the unmitigated and mitigated scenarios is a high positive as the probability of the impact is definite.

The additional work required to address this issue is described in 7.3.6 of this scoping report.

ISSUE: NEGATIVE SOCIO-ECONOMIC IMPACTS (INWARD MIGRATION)

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining projects have the potential to result in negative socio-economic impacts in all phases. Changes to the operations could contribute to the following negative impacts:

- Influx of people into the area in search of work, leading to informal settlements and associated problems of crime, disease, and social disruption.
- Increased pressure on housing and related services (water, power, sanitation, rubbish removal, schooling).
- Reduced quality of life for surrounding landowners.
- Possible reduced property values.

Taking the above into consideration the severity has been rated as high without mitigation. It may be possible to mitigate the inward migration by managing expectations with regard to employment through communication structures and by working with local landowners, and authorities to address social concerns. In the normal course, social impacts associated with each phase of the project will occur for the life of the project, but negative social issues associated with inward migration can continue beyond the closure of the mine, particularly in the unmitigated scenario. In both the unmitigated and mitigated scenarios, the impacts of inward migration could extend beyond the site boundary to nearby communities. The significance is medium without mitigation. In the mitigated scenario, impacts associated with inward migration can be reduced to low.

The additional work required to address this issue is described in Section 7.3 of this scoping report.

6.7.8 TOPOGRAPHY

ISSUE: HAZARDOUS EXCAVATIONS AND INFRASTRUCTURE THAT CAN BE HARMFUL TO PEOPLE AND ANIMALS

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. Due to the active mining activities on site, some hazardous facilities exist on site. Included in this category is surface subsidence associated with mining areas. Changes to the operations have the potential to contribute to additional infrastructure that may be considered hazardous to third parties and animals. Hazardous excavations and infrastructure occur in all mine phases from construction through operation to decommissioning and closure.

The overall severity in the unmitigated scenario is expected to be high. This can reduce to low with the implementation of management measures focused on access control and the design of the open pit concurrent rehabilitation components to prevent and/or mitigate impacts. In the event of injury to third parties or humans, the potential health impact could be long-term in nature. The spatial scale may extend beyond the project site to the communities to which the injured people or animals belong. The significance of this impact is high without mitigation and could be reduced to medium with mitigation.

The additional work required to address this issue is described in Section 7.3 of this scoping report.

6.7.9 VISUAL

ISSUE: NEGATIVE VISUAL IMPACTS

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining infrastructure and activities exist on site. Project related activities will result in a change to infrastructure and operation on site. These changes may alter the visual impact of the mine. Visual impacts on this receiving environment may be caused by activities and infrastructure in all mine phases. The more significant visual impacts relate to the larger infrastructure components (such as the open pit mining, crushing and screening facilities and stockpiles). After closure most of the infrastructure should be removed and/or the site and remaining infrastructure rehabilitated.

The severity in the unmitigated scenario is moderate when considered in the context of existing mining operations located north, north-west and south-west of the project area. The severity is unlikely to reduce with mitigation until the closure phase when all surface infrastructure on the site has been rehabilitated (in the mitigated scenario). Without mitigation the duration will be long term. The spatial scale will extend beyond the mine boundary in both the unmitigated and mitigated scenarios. The significance of this impact is medium in the unmitigated scenario. In the mitigated scenario the significance of the impact is high before closure and medium after closure given that the site will have been rehabilitated.

The additional work required to address this issue is described in Section 7.3 of this scoping report.

6.7.10 TRAFFIC

ISSUE: DISTURBANCE OF ROADS BY PROJECT RELATED TRAFFIC

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

An increase in traffic as well as the use of these roads by heavy vehicles may result in a decrease in road service and safety levels. Traffic impacts are expected from construction through to the end of the decommissioning phase when trucks, buses, and private vehicles make use of the public transport network surrounding the project area. The key potential traffic related impacts are on road capacity and public safety when additional traffic is added to the existing transport network. In addition to this, the establishment of the D3340 emergency access point as part of the project can result in safety issues particularly if the design and implementation are not undertaken with appropriate safety protection measures. In the unmitigated scenario the severity is high. In the mitigated scenario the severity reduces to medium because the frequency of potential accidents is expected to reduce. Any serious injury or death is a long term impact in both the unmitigated and mitigated scenarios. The spatial scale is medium in both the unmitigated and mitigated scenarios given that any injuries or fatalities will extend to the

communities to which injured people/animals belong. The significance is high in the unmitigated scenario and can be reduced to medium with mitigation with a reduction in probability.

The additional work required to address this issue is described in Section 7.3 of this scoping report.

6.7.11 NOISE

ISSUE: INCREASE IN DISTURBING NOISE LEVELS

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

A number of noise generating activities are associated with the active mining operations on site. Changes to the operations have the potential to add additional noise emission sources which could contribute to ambient noise levels and impact on the closest third party receptors. These additional noise sources could include operation of the expanded mine and supportive equipment, on-surface handling of materials and transportation of staff, equipment and consumables. The severity in the unmitigated scenario is expected to be medium and can be reduced to low with mitigation measures. In both the unmitigated and mitigated scenarios the noise pollution impacts will occur until the closure phase of the mine when the noise generating activities are stopped. This is a medium duration. In the unmitigated and mitigated scenarios the noise impacts will extend beyond the site boundary. The significance is medium in the unmitigated scenario and can be reduced to low with mitigation.

The additional work required to address this issue is described in Section 7.3.7 of this scoping report.

6.7.12 VIBRATIONS AND BLASTING

ISSUE: BLASTING RELATED IMPACTS (AIR BLASTS, GROUND VIBRATION AND FLY ROCK)

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
N/A		N/A	N/A

Discussion

Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the project area. Blasting hazards include ground vibration, airblast and fly rock. Ground vibrations travel directly through the ground and have the potential to cause damage to surrounding structures. Airblasts result from the pressure released during the blast resulting in an air pressure pulse which travels away from the source and has the potential to damage surrounding structures. Fly rock is the release of pieces of rock over a distance and can be harmful to people and animals and damage structures and property.

The expansion of the open pit mining operations has the potential to contribute to blasting related impacts from the mine if not appropriately managed.

The potential impact could have a high severity in the unmitigated scenario. In the mitigated scenario, this severity reduces to low because measures can be taken to control blasts and associated impacts. Blasting will only take place for the life of the project, however, injury or death is considered long term in nature. The spatial scale may extend beyond the mine boundary in both the unmitigated and mitigated scenario. The probability of injury to third party or damage to third party infrastructure is considered to be moderate in the unmitigated scenario and can be reduced to low with mitigation. The overall significance is expected to be high in the unmitigated scenario and low in the mitigated scenario.

The additional work required to address this issue is described in Section 7.3.8 of this scoping report.

6.7.13 HERITAGE/CULTURAL AND PALAEOLOGICAL RESOURCES

ISSUE: LOSS OF OR DAMAGE TO HERITAGE AND/OR PALEONTOLOGICAL RESOURCES

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

There are a number of activities/infrastructure in all phases prior to closure that have the potential to remove, damage or destroy heritage/cultural resources, either directly or indirectly, and result in the loss of the resource for future generations. In the unmitigated scenario the severity is medium. With mitigation measures in place that aim to minimise the disturbance of heritage/cultural sites, the severity is reduced to low. If the heritage/cultural resources are removed, damaged or destroyed the impact duration is long term. In the mitigated scenario the duration reduces to less than the project life. The spatial scale will be localised to the site boundary in both the unmitigated and mitigated scenario. The significance of the impact is medium and can be reduced to low with mitigation with a reduction on probability.

The additional work required to address this issue is described in Section 7.3.9 of this scoping report.

6.7.14 LAND USE

ISSUE: CHANGE IN LAND USE

Phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining and project related activities and infrastructure may have an impact on land uses within and surrounding the project area in all phases.

Land uses surrounding the project area include: farming, residential and mining.

These land uses may be affected by one or more of the following environmental and social impacts:

- Hazardous infrastructure and excavations.
- Land clearing (vegetation and soil) for infrastructure and activities.
- Surface and groundwater quality and quantity.
- Noise pollution.
- Air pollution.
- Traffic related safety impacts.
- Visual.
- Inward migration.

In the unmitigated scenario the severity is high and can be reduced to medium/low with mitigation that is focussed on prevention and/or controls for each environmental and social impact type. In the unmitigated scenario the impact on land use will extend beyond mine closure. With mitigation the land use impacts are expected to be limited to the phases prior to mine closure. The spatial scale extends beyond the project area in both the unmitigated and mitigated scenario. The unmitigated significance is high where environmental and social impacts are uncontrolled; the probability that land uses will be impacted by mining is definite. With mitigation this reduces to medium prior to closure and to low post closure.

The additional work required to address this issue is described in 7.3.4 of this scoping report.

6.8 POSSIBLE MITIGATION MEASURES AND THE LEVEL OF RESIDUAL RISK

The table below provides a list of the prominent impacts identified by the EAP or raised by interested and affected parties, as well as the possible management and mitigation measures. The level of residual risk after management or mitigation is also estimated. This will be refined during the EIA and EMP phase with specialist input as appropriate.

TABLE 6-7: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Open pit mining Mineralised waste	Loss and sterilization of mineral resources	<ul style="list-style-type: none"> • Incorporate cross discipline planning to avoid mineral sterilisation. • Mine workings will be developed and designed so as not to limit the potential to exploit deeper minerals. 	Low
Earthworks Civil works Open pit mining Crushing and screening plant Transportation Mineralised waste Water supply and use Power supply and use Support services Demolition Rehabilitation Maintenance and aftercare	Hazardous excavations and infrastructure that can be harmful to people and animals	<ul style="list-style-type: none"> • Mine safety systems and DMR compliance. • Access control, barriers and warning signs at hazardous areas. • Operate the open pit in a manner to address stability related safety risks to third parties and animals. • Monitoring and maintenance post closure to observe whether the relevant long-term safety objectives have been achieved and to identify the need for additional intervention where the objectives have not been met. • Where UMK has caused injury or death to third parties and/or animals, appropriate compensation will be provided. • In case of injury or death due to hazardous excavations, an emergency response procedure must be implemented. 	Low
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Mineralised waste	Loss of soil resources and land capability through pollution	<ul style="list-style-type: none"> • Mine environmental management system and compliance. • Basic infrastructure design that is adequate to contain polluting substances. • Training of workers to prevent pollution. • Equipment and vehicle maintenance. • Fast and effective clean-up of spills. • Effective waste management. • In case of major spillage incidents an emergency response procedure must be 	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Non-mineralised waste Water supply and use Power supply and use Support services General site management Demolition Rehabilitation Maintenance and aftercare		implemented.	
Earthworks Open pit mining Crushing and screening plant Transport system Mineralised waste Non-mineralised waste Water supply and use Power supply and use Support services General site management Demolition Rehabilitation Maintenance and aftercare	Loss of soil resources and land capability through physical destruction	<ul style="list-style-type: none"> Limit site clearance to what is absolutely necessary. Develop and implement a soil management plan that addresses soil stripping, stockpiling and use for rehabilitation. 	Low
Site preparation Earthworks Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management	Physical destruction of biodiversity	<ul style="list-style-type: none"> Limit site clearance to what is absolutely necessary. Preconstruction surveys of the development footprints for species suitable for search and rescue operations. Avoid sensitive areas as far as practically possible. Collection of pods of <i>Vachellia erioloba</i> (Camel Thorn) and <i>Vachellia haematoxylon</i> (Grey Camel Thorn) in order to aid in the re-establishment of these species. Obtain relevant permits prior to removal of protected tree species. A comprehensive monitoring programme of the protected trees within the area must be undertaken. This monitoring should be conducted on an individual tree basis as well as monitoring on a community level. 	Medium

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Demolition Rehabilitation Maintenance and aftercare		<ul style="list-style-type: none"> • Implementation of an alien invasive species programme. • Implementation of a biodiversity action plan to ensure that the undeveloped/mined areas within the property are properly conserved and maintained. • Effective rehabilitation to as close to pre-mining conditions as practically possible. 	
Site preparation Earthworks Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	General disturbance of biodiversity	<ul style="list-style-type: none"> • Limit dust emissions and soiling of vegetation. • Training of employees on the value of biodiversity. • Zero tolerance for harming and harvesting fauna and flora. • Limit light and noise disturbance as far as practically possible. • Effective waste management and pollution prevention. • Effective rehabilitation to as close to pre-mining conditions as practically possible. • Prevention and combatting veld fires through establishment and maintaining of fire breaks and through the education of employees in order to comply with the National Veld and Forest Fire Act No. 101 of 1998. 	Medium
Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition	Contamination of surface water resources	<ul style="list-style-type: none"> • Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999): <ul style="list-style-type: none"> ○ Clean and dirty water system will be separate; ○ Clean run-off will be diverted away from the site; ○ Dirty water will be contained; • Conduct surface water monitoring and implement remedial actions as required. • Effective equipment and vehicle maintenance. • Fast and effective clean-up of spills. • Effective waste management. • Education and training of workers. • Effective rehabilitation of residue facility and the overall site. 	Medium/Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Rehabilitation Maintenance and aftercare			
Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Alteration of natural drainage patterns (Loss from containment infrastructure)	<ul style="list-style-type: none"> Develop and implement a stormwater management plan to minimise containment areas and divert clean water away from the site. Effective rehabilitation to as close to pre-mining conditions as practically possible. 	Low
Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Contamination of groundwater resources	<ul style="list-style-type: none"> Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999). Infrastructure that has the potential to pollute groundwater will be identified and included into a groundwater pollution management plan which will be implemented as part of the operational phase. Conduct groundwater monitoring and implement remedial actions as required. This includes compensation for mine related loss of third party water supply. Effective equipment and vehicle maintenance. Fast and effective clean-up of spills. Effective waste management. Education and training of workers. Effective rehabilitation of residue facility and the overall site. 	Medium/Low
Open pit mining Water supply and use	Reducing groundwater levels and availability (Pit dewatering)	<ul style="list-style-type: none"> Conduct groundwater monitoring and implement remedial actions where required. This includes compensation for mine related loss of third party water 	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
		supply. <ul style="list-style-type: none"> This monitoring programme should include third party boreholes. 	
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Pollution from emissions to air	<ul style="list-style-type: none"> Limit disturbed areas. Suppress dust effectively on unpaved roads and at material transfer points as required. Monitor pollutants of concern and implement additional mitigation as required. Maintain vehicles and equipment in good working order. Undertake a carbon footprint assessment. 	Medium
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Mineralised waste Non-mineralised waste Support services Demolition Rehabilitation	Increase in disturbing noise levels	<ul style="list-style-type: none"> Maintain vehicles and equipment in good working order. Conduct noise monitoring in the unlikely event that UMK receives noise related complaints. Adhering to blasting schedule. 	Low
Open pit mining	Blasting related impacts (Air blasts, ground vibration and fly rock)	<ul style="list-style-type: none"> Develop and implement a blast management plan which addresses blast design criteria to limit air blast, ground vibration and fly rock; pre-blast warning and evacuation and auditing of the blasts to check compliance to applicable requirements. 	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
		<ul style="list-style-type: none"> • Communication of scheduled blasts with IAPs. • Remediation of all impacts caused by blasting. • In case of a person or animal being injured by blasting activities an emergency response procedure will be followed. • Limit blasting frequency and conduct blasting during daylight hours. 	
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Negative visual impacts	<ul style="list-style-type: none"> • Limit disturbed areas. • Suppress dust to prevent a visual dust cloud. • Con-current rehabilitation. • Effective waste management. • Implement effective use of lighting which reduces light spill. • Effective rehabilitation of the overall site. 	Medium and low at closure
Transport system	Disturbance of roads by project related traffic	<ul style="list-style-type: none"> • Construct safe access point. • Educate employees (temporary and permanent) about road safety. • Enforce strict vehicle speeds. • If a person or animal is injured by transport activities an emergency response procedure must be implemented. 	Medium
Site preparation Earthworks Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use	Loss or damage to heritage and/or palaeontological resources	<ul style="list-style-type: none"> • Limit the area of disturbance as far as practically possible. • Training of workers about the heritage and cultural sites that may be encountered and about the need to conserve these. • These resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval. In the event that resources are identified, a chance find emergency procedure should be implemented. 	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare			
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Positive socio-economic impacts (Economic impact)	<ul style="list-style-type: none"> • Employ local people and procure goods and services locally as far as practically possible. • Ensure that closure planning considerations address the re-skilling of employees for the downscaling, early closure and long-term closure scenarios. 	High positive
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste	Negative socio-economic impacts (Inward migration)	<ul style="list-style-type: none"> • Effective communication with local communities to manage expectations with regard to employment and other opportunities. • Worker training on health and safety related issues. 	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Support services General site management Demolition Rehabilitation Maintenance and aftercare			
Site preparation Earthworks Civil works Open pit mining Crushing and screening plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Change in land use	<ul style="list-style-type: none"> Effectively manage noise, dust, surface and groundwater quality, blasting hazards, social impacts and visual impacts. Effective rehabilitation of the overall site for post closure land use. 	Medium and low at closure

6.9 THE OUTCOME OF THE SITE SELECTION MATRIX

Not applicable.

6.10 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

No layout alternatives exist as the location of opencast activities is dictated by the location of the fixed ore body. Infrastructure within the site layout will be optimised to improve efficiencies and productivity within the mine. The same applies to the mining method, no mining method alternatives exist as the method is dictated by the depth of the ore body. No alternatives in terms of operational service aspects were considered as the services already approved, constructed and/or in use by the UMK Mine will be utilised.

The only project alternative to be considered is the no-go alternative.

6.11 STATEMENT MOTIVATING THE PREFERRED ALTERNATIVES

Refer to Section 6.10.

7 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

The main objectives of the EIA and EMP phase will be to:-

- Assess the potential cultural, heritage, socio-economic and biophysical impacts of the project.
- Identify and describe procedures and measures that will mitigate potential negative impacts and enhance potential positive impacts.
- Liaise with IAPs including relevant government departments on issues relating to the project to ensure compliance with existing guidelines and regulations.
- Undertake consultation with IAPs and provide them with an opportunity to review and comment on the outcomes of the EIA process and acceptability of mitigation measures.
- Update the approved EMP and conceptual closure/decommissioning plan.
- Review and update (where necessary) the measures for ongoing monitoring (including environmental audits) to ensure that the project plan and mitigation measures are implemented as outlined in the detailed EIA and EMP report.

This chapter describes the nature and extent of further investigations to be conducted by SLR and specialists in the EIA, and sets out the proposed approach to the EIA and EMP phase.

7.1 DESCRIPTION OF ALTERNATIVES TO BE CONSIDERED INCLUDING THE OPTION OF NOT GOING AHEAD WITH THE ACTIVITY

No alternatives could be considered other than the no-go alternative as discussed and motivated in Sections 6.1 and 6.10.

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

This section lists the aspects that will be considered and investigated in the Environmental Impact Assessment phase.

This section below provides a list of potential impacts on environmental and socio-economic aspects in respect of each of the main project actions / activities and processes that will be assessed during the EIA and EMP phase. The potential impacts are presented for each of the project phases in tabular format (Table 7-1).

TABLE 7-1: LIST OF POTENTIAL IMPACTS AS THEY RELATE TO PROJECT ACTIONS / ACTIVITIES / PROCESSES

Main activity/process	Phase	Impacts (unmitigated)
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Main activity/process	Phase	Impacts (unmitigated)
Site preparation Earthworks Civil works Open-pit mining Crushing and screening plant Transport systems Power supply and use Water supply and use Mineralised waste Non-mineralised waste management (general and hazardous) Support services General site management Demolition Rehabilitation Maintenance and aftercare	Operation Decommissioning Closure Post-closure	Hazardous excavations and infrastructure that can be harmful to people and animals Biodiversity (Indirect loss and disturbance) Pollution from emissions to air Increase in disturbing noise levels Negative visual impacts Loss of or damage to heritage and/or palaeontological resources Loss of soil resources and land capability through pollution and physical disturbance Surface water (Contamination and alteration of base flow) Groundwater (Contamination and lowering of groundwater levels and availability) Socio-economic (Positive and negative socio-economic impacts) Blasting related impacts (Air blasts, ground vibration and fly rock) Disturbance of roads by project related traffic Loss and sterilisation of mineral resources Change in land use (secondary impact)

7.3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

For the following environmental aspects, it is proposed that no specialist investigations are required. The updated qualitative assessment and detailed management measures for the mine including the changes to the operations will be provided in the EIA and EMP by SLR.

- Surface water;
- Topography;
- Visual;
- Geology;
- Traffic;
- Social; and
- Land use.

Environmental aspects that will be subjected to specialist investigation in the EIA and EMP phase include:

- Air Quality;
- Surface Water Update;
- Groundwater, Geochemistry and Waste;
- Soil and Land Capability;
- Biodiversity Update;
- Economic;
- Noise;
- Vibrations and Blasting;

- Heritage/Cultural and Palaeontology Resources; and
- Closure Cost Update.

The proposed terms of reference for the above specialist studies is detailed further below.

7.3.1 AIR QUALITY

A specialist study is required and will include the followings tasks:

- Review of available baseline air quality data.
- Quantification of all sources of atmospheric emissions associated with the project.
- Identification of potential air pollution receptors.
- Development of an atmospheric dispersion model to predict emission dispersions from the mine.
- Screening of model outputs against relevant air quality assessment criteria.
- Evaluation of potential for human health and environmental impacts.
- Provide input, together with SLR and the technical project team into air quality management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.2 WATER BALANCE UPDATE

A specialist study is required and will include the update of the site's climatic water balance to reflect the updated groundwater modelling results, updated stormwater management plan and project expansion layout.

An updated stormwater management plan for the site will be provided by AECOM for inclusion in the EIA and EMP.

7.3.3 GROUNDWATER, GEOCHEMISTRY AND WASTE

A specialist study is required and will include the followings tasks:

- Baseline ground water sampling (water levels and quality) in the study area to confirm the groundwater regimes and aquifers that could be affected by the project.
- Determine the geochemical pollution potential of key potential sources of mineralised waste.
- Model the pollution dispersion (from key sources) and de-watering impacts of the mine.
- Assess the significance of potential impacts.
- Provide input, together with SLR and the technical project team into groundwater management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.4 SOIL, LAND USE AND LAND CAPABILITY

A specialist study is required to augment the information presented in the approved EIA and EMP (2007) and will include the followings tasks:

- Map the soils in the relevant sections of the project site.
- Determine the physical and chemical soil properties.
- Determine the current land capabilities on site following the classification system stipulated by the South African Chamber of Mines to determine pre-mining baseline land capabilities.
- Determine the current land uses on site.
- Assess the impact of the project on soil, land use and land capability.
- Provide input together with SLR and the technical project team into soil resource management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.5 BIODIVERSITY UPDATE

An update of the previous specialist study conducted for the mine is required and will include the followings tasks:

- Assess at a desktop level the status of the species either identified on site or known to occur in the area to ensure that this has not changed and that there are no additional species of conservation concern.
- Comment on the site sensitivity.
- Comment on the mine's cumulative impact on the loss of certain vegetation communities and habitat including associated faunal species.
- Provide input together with SLR and the technical project team into biodiversity management measures going forward.

The assessments and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.6 ECONOMIC AND SUSTAINABILITY ANALYSIS

A specialist study is required and will include the followings tasks:

- Describe the economic baseline of the local/municipal area (current levels and historic trends).

- Assess economic impacts.
- Provide a comparative sustainable land use analysis.
- Provide input together with SLR and the technical project team into economic management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.7 NOISE

A specialist study is required and will include the followings tasks:

- Determine the pre-project noise environment through noise sampling.
- Identify potential noise receptors.
- Establish an updated noise emissions inventory for key noise sources.
- Assess cumulative on-site noise impacts taking into consideration the existing UMK operations.
- Provide input together with SLR and the technical project team into noise management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.8 VIBRATIONS AND BLASTING

A specialist study is required and will include the followings tasks:

- Review of UMK Mine's blast plan.
- Assess blasting related impacts on potential receptors including grave sites.
- Provide input together with SLR and the technical project team into blast management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.9 HERITAGE/CULTURAL AND PALAEOLOGICAL RESOURCES

A specialist study is required to augment the information presented in the approved EIA and EMP (2007) and will include the followings tasks:

- Identify and map all heritage and paleontological (through literature review and field work) resources in the area to be disturbed by project infrastructure.
- Assess the significance of the identified resources.

- Assess the impact on heritage and palaeontological resources.
- Provide input together with SLR and the technical project team into management measures going forward.

The assessment and detailed management measures will be provided in the EIA and EMP report by SLR. A copy of the specialist report will be provided in the EIA and EMP.

7.3.10 CLOSURE COST UPDATE

It is proposed that the closure cost estimate be updated in accordance with Section 24P of NEMA and the Financial Provisioning Regulations (GNR 1147 of 2015).

7.4 PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL ASPECTS

A description of the method that will be used during the EIA phase to assess the environmental aspects is provided in Section 6.6.

7.5 THE PROPOSED METHOD OF ASSESSING DURATION AND SIGNIFICANCE

A description of the method that will be used during the EIA phase to assess the duration and significance of the identified impacts is provided in Section 6.6.

7.6 THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

The draft and final EIA and EMP reports will be submitted to all registered commenting authorities and the DMR for review. A site visit and meeting shall be held, if requested.

7.7 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS WITH REGARDS TO THE IMPACT ASSESSMENT PROCESS THAT WILL BE CONDUCTED

7.7.1 STEPS TO BE TAKEN TO NOTIFY INTERESTED AND AFFECTED PARTIES

IAPs registered on the project database will be provided with information in the form of summary documents and will be notified when the EIA and EMP report will be available for public review via electronic mail and sms. IAPs will similarly be invited to attend a public feedback meeting during the EIA phase, if required.

7.7.2 DETAILS OF THE ENGAGEMENT PROCESS TO BE FOLLOWED

The stakeholder engagement process in the EIA Phase will include the following:

- Public and/or stakeholder meeting/s to give feedback on the findings of the EIA (if required);
- Collation of issues and concerns into a report for submission to the DMR;
- Circulation of the EIA and EMP report (draft and final if there are material changes made to the draft report) for public and authority review and collation of comments;
- Notification of IAPs on the database on the relevant DMR decisions.

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

The following information will be included in the EIA and EMP reports which will be made available for public review:

- Detailed description of the project.
- A site layout.
- Details of the list of activities to be authorised in terms of NEMA and NEM:WA.
- Scale and extent of activities to be authorised in terms of NEMA and NEM:WA.
- The duration of the activity.
- An assessment of the environmental and socio-economic impacts identified during the environmental assessment process, through input from IAPs, regulatory authorities and specialists.
- Detailed management measures to reduce and control environmental and socio-economic impact.
- Copies of the specialist reports undertaken for the project.

During the EIA and EMP Phase a summary of the findings of the EIA will be provided in English and Afrikaans. The EIA and EMP report will be subjected to public review. Once the DMR has issued decisions on the applications, IAPs registered on the project database will be informed accordingly.

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

A description of the tasks that will be undertaken during the EIA phase is provided below in Table 7-2.

TABLE 7-2: EIA TASKS AND TIMING

Phase	EAP activity	Opportunities for Consultation and Participation		SCHEDULE
		Competent Authorities	IAPs, State Departments and Organs of State	
Specialist Assessments and Input	EAP to manage specialist activities and receive inputs for EIA and EMP.			March to April 2017

Phase	EAP activity	Opportunities for Consultation and Participation		SCHEDULE
		Competent Authorities	IAPs, State Departments and Organs of State	
EIA Phase	Assess environmental impacts. Compile draft EIA and EMP report.			May 2017
	Submit draft EIA and EMP report to IAPs and authorities.	Review of draft EIA and EMP report (30 days). Comments to EAP.	Review of draft EIA report (30 days). Comments to EAP.	June 2017
	Arrange meetings and consultations	Meetings with authorities during EIA and EMP if required.	Public Feedback Meeting if required. Focused consultation with IAPs or commenting authorities if required.	
	Address public comment and finalise EIA and EMP report			July 2017
Authority review and Authorisation Phase	Final EIA report to DMR (106 days from acceptance of scoping).	Authority Acknowledge Receipt of EIA report (10 days).	Review of final EIA report Comments to CA	August to November 2017
		Environmental Authorisation Granted / Refused (107 days).		
			Notifications to IAPs regarding environmental authorisation (granted or refused).	December 2017
Appeal Phase	EAP to provide guidance regarding the appeal process as and when required.	Consultation during processing of appeal if relevant.	Submit appeal in terms of National Appeal Regulations	To be determined, if applicable.

7.9 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

See Table 6-7. It should be noted that this table has been compiled with the information in hand and will be refined during the EIA and EMP phase.

7.10 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional requests for information have been received to date.

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

The potential socio-economic impacts are discussed in Section 6.7.

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

A heritage study will be conducted to identify potential impacts on heritage resources. The results of this study will be provided in the EIA and EMP.

8 OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT

No other matters are required in terms of Section 24(4)(A) and (B) of the act.

9 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Marline Medallie, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from the stakeholder and interested and affected parties has been correctly recorded in the report.




Signature of the EAP

Date: 13 March 2017

10 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I, Marline Medallie, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with interested and affected parties and stakeholders has been correctly recorded and reported herein.


Signature of the EAP

Date: 13 March 2017

11 REFERENCES

Joe Morolong Spatial Development Framework, September 2012.

Metago Environmental Engineers (Pty) Ltd, Environmental Impact Assessment / Environmental Management Programme for a Proposed Manganese Mine – United Manganese of Kalahari (Pty) Ltd, April 2007.

Regional GIS databases.

SANBI, 2012: National Freshwater Ecosystem Priority Assessment.

SANBI, 2012: Grasslands Programme - Mining and Biodiversity Guidelines: Biodiversity priority areas sensitive to the impacts of mining categorised into four categories.