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SCOPING REPORT FOR THE DEVELOPMENT OF THE PROPOSED UNDERGROUND KHWARA MANGANESE MINE

MAY 2017

SCOPING REPORT

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

NAME OF APPLICANT: KHWARA MANGANESE (PTY) LTD

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SCOPING REPORT FOR THE DEVELOPMENT OF THE PROPOSED UNDERGROUND KHWARA MANGANESE MINE

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ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
℃	Degrees Celsius
BID	Background information document
CO	Carbon Monoxide
CO2	Carbon Dioxide
CR	Critically Endangered
DALA	Department of Agriculture and Land Affairs
DAFF	Department of Agriculture, Forestry and Fisheries
DENC	Department of Environment and Nature Conservation
DMR	Department of Mineral Resources
DPWRT	Department of Public Works, Roads and Transport
DRDLR	Department of Rural Development and Land Reform
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EN	Endangered
EIA	Environmental impact assessment
EMP	Environmental management programme
IAPs	Interested and/or affected parties
Ha	Hectares
HCs	Hydrocarbons
IUCN	International Union for Conservation of Nature
JMLM	Joe Morolong Local Municipality
JTGDM	John Taolo Gaetsewe District Municipality
Khwara	Khwara Manganese (Pty) Ltd
km	Kilometre
LHD	Load-Haul-Dump
L/s	Litres per second
m	Meter
mm	Millimetre
m/s	Metres per second
mm/year	Millimetres per year
MAP	Mean annual precipitation
mamsl	Meters above mean sea level
mcm	Million cubic meters
MPRDA	Mineral and Petroleum Resources Development Act No. 28 of 2002
N/A	Not applicable
NCNCA	Northern Cape Nature Conservation Act
NEMA	National Environmental Management Act No.107 of 1998
NEM:BA	National Environmental Management: Biodiversity Act No. 10 of 2004
NEM:WA	National Environmental Management: Waste Management Act No. 59 of 2008
NFEPA	National Freshwater Ecosystem Priority Areas 2011
NPAES	National Protected Areas Expansion Strategy 2008
NO_x	Nitrous Oxides
NWA	National Water Act No. 36 of 1998
P	Protected
PRECIS	Pretoria Computer Information Systems
ROM	Run-of-mine
SO2	Sulphur Dioxide
SA	South Africa

Acronyms / Abbreviations	Definition
SACNSP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANBI	South African National Botanical Institute
SANS	South African National Standards
SAS	Scientific Aquatic Services
SLR	SLR Consulting (South Africa) (Pty) Ltd
Tshipi	Tshipi é Ntle Manganese Mining (Pty) Ltd

INTRODUCTION

INTRODUCTION TO THE PROPOSED PROJECT

Khwara Manganese (Pty) Ltd (Khwara) holds a prospecting right for manganese on portion 2 of the farm Wessels 227 and the remaining extent and portion 3 and 4 of the farm Dibiaghomo 226, north of Black Rock in the Northern Cape Province. On the adjacent farm (Portion 1 of Lehating 741), Lehating Mining (Pty) Ltd (Lehating) holds the mining right and have an approved environmental management programme (EMP) from the Department of Mineral Resources (DMR) for manganese and iron (approved October 2013). Lehating also hold an environmental authorisation (EA), issued by the Department of Environment and Nature Conservation (DENC) in September 2014 in terms of the National Environmental Management Act, 107 of 1998 (NEMA). It is important to note that the construction of the Lehating Mine is still to commence.

Khwara has applied to the DMR for a mining right over the above portions of the farms Wessels 227 and Dibiaghomo 226, referred to as the Khwara Mine project. The resource will be accessed and mined from the Lehating mine (underground). Approved surface infrastructure at the Lehating Mine will be used to support the mining of the underground resource on the farms Wessels 227 and Dibiaghomo 226 and as such no surface infrastructure will be established as part of the proposed project.

The EIA process comprises two phases: a scoping phase and an environmental impact assessment phase with the environmental management programme (EIA and EMP) phase. This report describes the scoping phase for the proposed project.

SLR Consulting (South Africa) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Khwara to undertake the environmental assessment process for the proposed project.

LEGAL FRAMEWORK

Prior to the commencement of the proposed project, environmental authorisation is required from various government departments. These include:

- Environmental authorisation from the Department of Mineral Resources (DMR) in terms of National Environmental Management Act No.107 of 1998 (NEMA). The proposed project incorporates a listed environmental activity. An application was submitted by Khwara to the DMR on 12 May 2017. The applicable listed activity is provided in Section 2.2.1. The EIA regulations being followed for this project are Regulation 982 of 04 December 2014.
- A mining right and an environmental authorisation from the Department of Mineral Resources (DMR) in terms of the Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA). The mining right application was submitted by Khwara to the DMR on 12 May 2017.
- A water use license from the Department of Water and Sanitation (DWS) in terms of the National Water Act No. 36 of 1998 (NWA). The applicable water uses in terms of Section 21 of the NWA

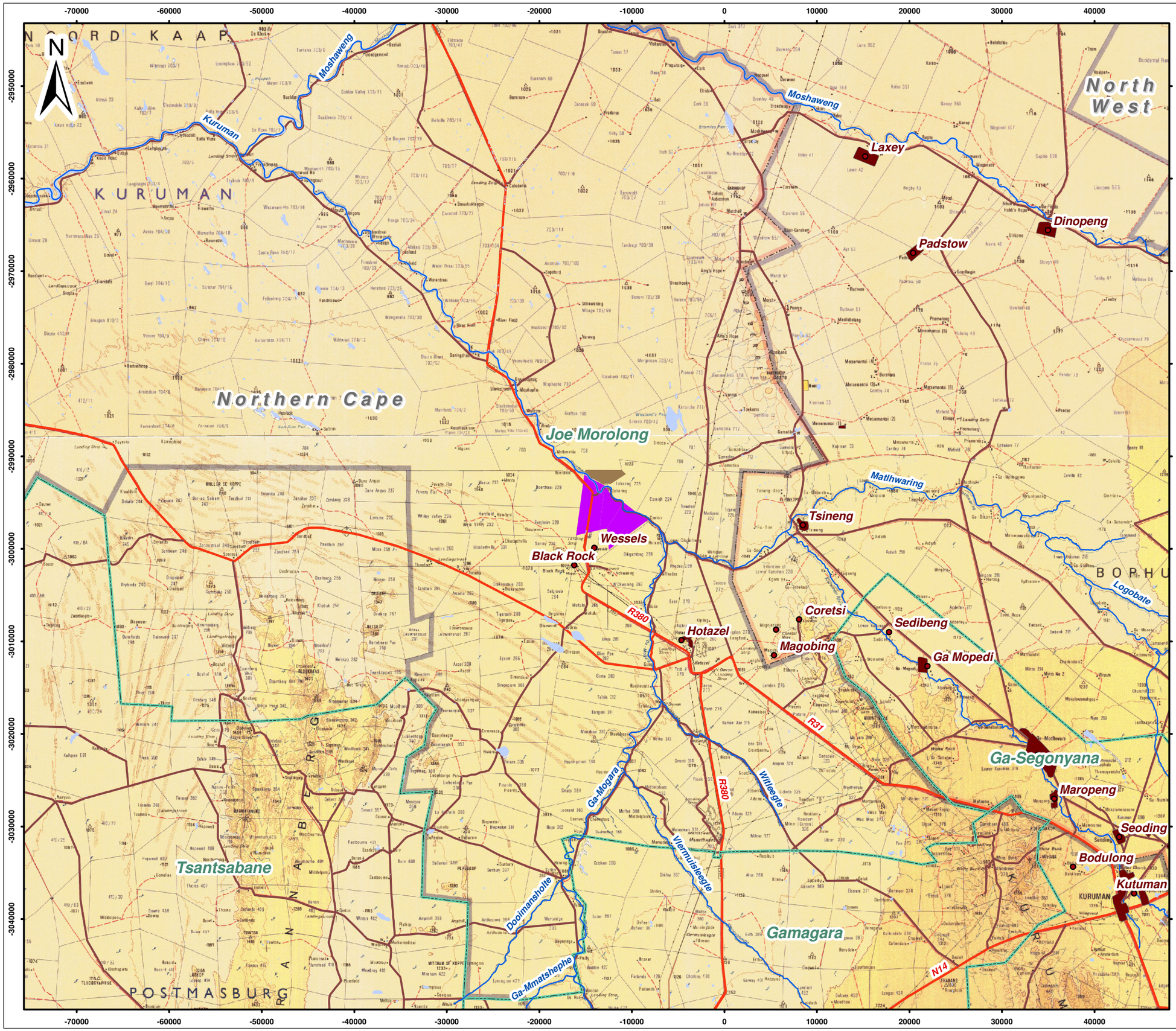
include (a – Abstraction of water from a water resource) and (j – removing of water found underground if it is necessary for the continuation of an activity or for the safety of people). A notice of intent to submit a water use license application has been submitted to the Department of Water and Sanitation (DWS). Proof of this submission is included in Appendix E.

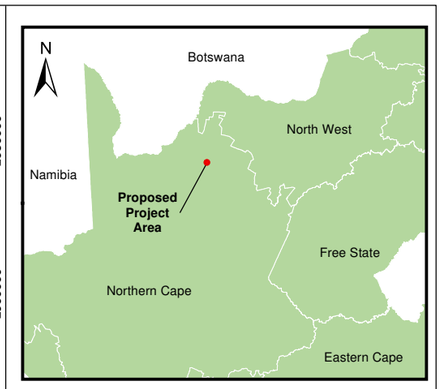
A single scoping report and EIA and EMP report supporting the new mining right application will be submitted to the DMR for decision making. Any additional approvals/permits needed for the project will be identified during the course of the environmental assessment process. A detailed list will be provided in the EIA and EMP report.

SCOPING PHASE OBJECTIVES

The objectives of the scoping phase are as follows:

- The identification of policies and legislation that is relevant to the proposed project
- To describe the proposed project including alternatives, if any, that are being considered
- To identify and provide a preliminary assessment of the potential environmental and social impacts taking into account all project alternatives
- To identify conceptual measures to avoid, manage or mitigate identified impacts
- To set out any related terms of reference for further investigations that will enable the meaningful assessment of all relevant environmental and social issues.





Legend

- Proposed Mining Rights Area
- Approved Lehateng Mining Right Area
- Urban Areas
- Local Municipalities 2011
- Provincial Boundary
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Wetlands

0 4 8 12 Kilometers

Scale: 1 : 400 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 1

Regional Setting

SLR Consulting (Africa) (Pty) Ltd
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-20000 -10000

N

Boerdraai

Lehateng Mine
(still to be constructed)

22 50' 51.2"E
27 2' 21.826"S

Boerdraai 228

Lehateng 741

Wessels 227

Dibiaghomo 226

Cornish 224

Bergheim 229

Santoy 230

Dikgathlong 268

Lehating

Diggings

Kuruman

Dibiaghomo

Bergheim

Landing Strip

22 50' 17.728"E
27 5' 54.244"S

22 52' 17.188"E
27 5' 30.677"S

22 55' 2.762"E
27 4' 59.48"S

22 52' 27.036"E
27 6' 43.252"S

Wessels Mine

Golf Course

Ysterkoppie

Black Rock

Manganese

Narrow Gauge

R380

49/703 43/703 741 1/741 1/224 2/227 3/226 RE/226 4/226 2/266 RE/227 1/226 2/230 5/267 1/267 1/264 1/227 1/268 263 264 229 228 224

1013 1012 1028 1014 994 1036 1016 1029 1011 1018 1032 1034 1041 1048 1022 1042

-3000000

Legend

- Proposed Mining Right Area
- Approved Lehateng Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Farm Boundaries
- Farm Portions

0 1 2 Kilometers

Scale: 1 : 41 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 2

Local Setting

SLR Consulting (Africa) (Pty) Ltd
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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 below.

TABLE 1: DETAILS OF THE EAPS

Details	Project manager and author	Reviewer
Name of the practitioner	Natasha Smyth	Alex Pheiffer
Tel No.:	011 467 0945	011 467 0945
Fax No.:	011 467 0978	011 467 0978
E-mail address	nsmyth@slrconsulting.com	-

Neither SLR nor any of the specialists involved in the environmental assessment process have any interest in the project other than fair payment for consulting services rendered as part of the environmental assessment process.

1.2 EXPERTISE OF THE EAP

Natasha Smyth has approximately 8 years of relevant experience (Curriculum Vitae attached in Appendix B). Alex Pheiffer holds an MSc degree in Environmental Management and is registered as an professional natural scientist (Environmental Science) with the South African Council for Natural Scientific Professions (SACNSP). Alex Pheiffer has over 15 years of relevant experience (Curriculum vitae attached in Appendix B). Both Natasha Daly and Alex Pheiffer have been involved in several impact assessments for large scale mining development in Southern Africa.

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2 PROJECT DESCRIPTION

2.1 PROJECT LOCALITY

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

TABLE 2: DESCRIPTION OF THE PROPERTY

Farm Name	• Portion 2 of the farm Wessels 227 • Remaining Extent, Portion 3 and Portion 4 of the farm Dibiaghomo 226
Application area (Ha)	No surface area will be disturbed as part of the proposed project given that the underground ore resources will be accessed via the Lehating Mine shaft. In addition to this, mine infrastructure associated with the Lehating mine will be adequate to support the proposed Khwara project.
Magisterial district	Located within the Kuruman Magisterial District and in the John Taolo Gaetsewe District Municipality
Local municipality	Joe Morolong Local Municipality
Distance and direction from nearest town	Located approximately 1.6 km north east of the town Black Rock
21 digit Surveyor General Code for each farm portion	Portion 2 of the farm Wessels 227: CO4100000000022700002 Remaining extent of the farm Dibiaghomo 226: CO4100000000022600000 Portion 3 of the farm Dibiaghomo 226: CO4100000000022600003 Portion 4 of the farm Dibiaghomo 226: CO4100000000022600004
Co-ordinates (Also illustrated on Figure 2)	Northern point: 22° 50’ 51.2’’ E and 27° 02’ 21.82’’ S Eastern point: 22° 55’ 2.76’’ E and 27° 04’ 59.48’’ S Southern point: 22° 52’ 27.03’’ E and 27° 06’ 43.25’’ S South Western point: 22° 50’ 17.72’’ E and 27° 05’ 54.24’’ S

The local and regional setting of the proposed project site is illustrated in Figure 1 and Figure 2. In addition to this the regional and local settings have also been included in Appendix C.

2.2 DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

2.2.1 LISTED AND SPECIFIED ACTIVITIES

The activities and infrastructure associated with the proposed project are listed in Table 3 below. In each case the relevant NEMA listed activity which will be triggered by the proposed project for the various activities and infrastructure has been provided in Table 3. Given that no surface infrastructure will be established as part of the proposed project, a surface infrastructure layout cannot be illustrated. The extent of the mining right area is shown in Figure 2.

TABLE 3: LIST OF ACTIVITIES/INFRASTRUCTURE ASSOCIATED WITH THE PROPOSED PROJECT

Description of activity	Aerial extent of the activity (ha)	Listed activity *	Listed activity number and applicable listing notice	NEMA listed activity description	NEMA listed activity relevance to the proposed project
Underground mining	Not applicable as the underground activities will not disturb any surface area	X	GNR. 984 (Activity 17) - as amended by the 2017 Amendment Notices GNR 325 (Activity 17)	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	The proposed project will require the exploitation of mineral resources which requires a mining right.
Dewatering of the underground workings		N/A	N/A	N/A	N/A
Use of Lehating's approved infrastructure and services within approved capacities	Not applicable	N/A	N/A	N/A	N/A

*X – indicates if the activity is listed or not in terms of NEMA

2.2.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

Information provided in the following section was provided to SLR by the Khwara project team and from the EIA and EMP report for the Lehating mine undertaken by SLR Consulting (SLR, September 2013).

The proposed project will not require the establishment of any surface infrastructure. Approved surface infrastructure at the Lehating Mine will be used to support the mining of the underground resource on the farms Wessels 227 and Dibiaghomo 226. If follows that a construction phase is not applicable to the proposed project, and as such the section below only focuses on activities associated with the operational, decommissioning and closure phases of the Khwara Mine Project.

2.2.2.1 OPERATIONAL PHASE

UNDERGROUND MINING METHOD

The resource to be mined is the manganese ore body of the Kalahari Manganese field. It is planned to mine the ore body using underground mining methods. In this regard, the mining will include the trackless mechanised bord and pillar mining technique. This technique is typical in the Kalahari Manganese Field and is used in all wide body mines from the perspectives of safety and productivity. It is anticipated that 0.55 million tonnes per annum of ore will be mined as part of the proposed project. The ore body is located at a depth of 220m to 350m meters below surface with a thickness of approximately 5m to 9m. A summary of the underground mining activities is provided in Table 4 below and is illustrated in Figure 3.

TABLE 4: SUMMARY OF UNDERGROUND MINING ACTIVITIES

Activity	Description
Drilling and blasting	Blasting and drilling methods will be used to loosen the ore material. It is estimated that blasting and drilling activities associated with the proposed project will take place at a depth of between 250 to 350 metres. It is anticipated that underground blasting will take place on a daily basis, anytime within a 24 hour period.
Removal of Run of Mine (ROM)	The blasted Run of Mine (ROM) ore will be transported by Load-Haul-Dump (LHDs) and mine trucks to the underground silos to undergo the first sizing.
Underground screening and crushing	The ROM will be passed through a screen which will separate out undersized and oversized ROM material. Undersized material (<350mm) will pass into the underground silo, and oversized material (>350mm) to be further broken down by a mobile impact breaker and then fed into the silo. All of the ore passing through the underground silo will be <350mm in size
Ore transportation to surface	Ore from the underground silo will be extracted from the underside of the silo into skips for transport to surface via the Lehating Shaft.

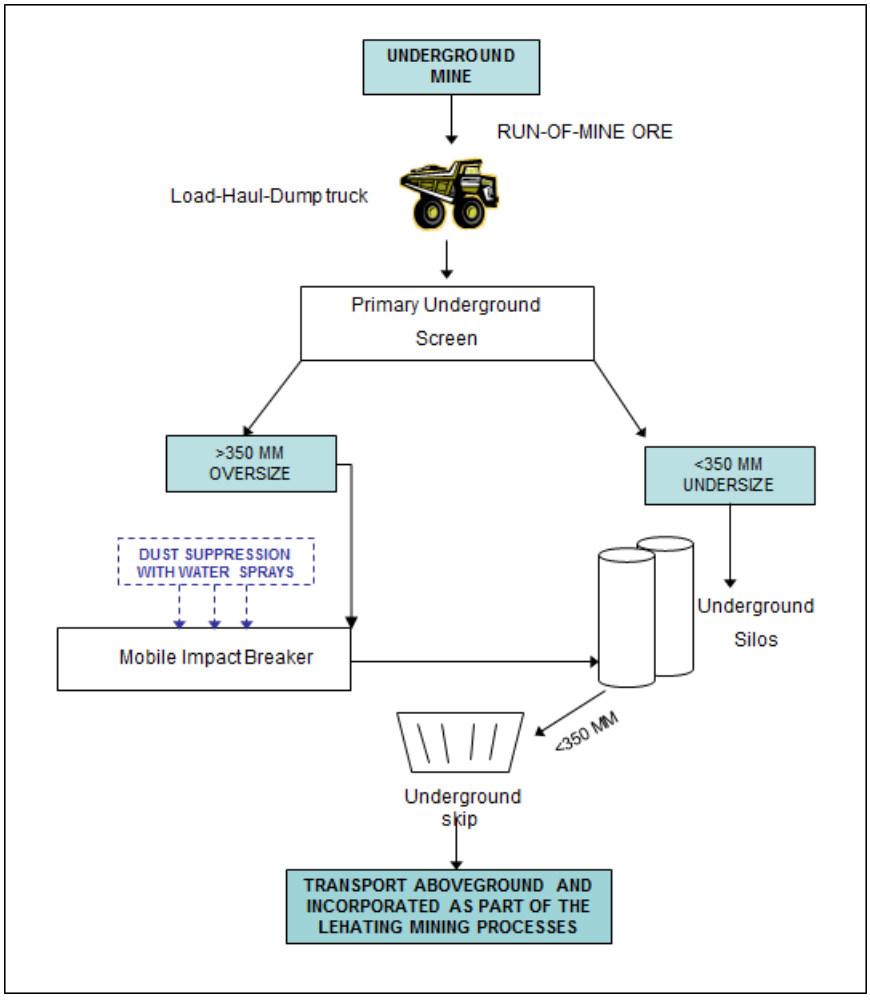


FIGURE 3: CONCEPTUAL PROCESS FLOW DIAGRAMME

SUPPORT SERVICES UTILISED FROM THE LEHATING MINE

Support services for the proposed project will be sourced from the Lehating Mine. Further detail is provided below. Given that the project will not add processing capacity to the Lehating Mine the already approved surface infrastructure on Lehating Mine will be adequate to support the mining associated with the proposed project and no additional capacities or services will be required in the short to medium term.

TRANSPORT SYSTEM

Road

The 10m wide gravel access road that will be constructed from the R380 to the Lehating Mine will be utilised for the proposed project (Figure 2).

This access road will be utilised by the following:

- All employees travelling to and from site
- The transportation of materials, supplies and consumables to and from site
- The transportation of ore from be via trucks

The proposed project will not alter the approved Lehating Mine's transportation system; rather the proposed project will form part of this system.

Pipelines

A series of pipelines associated with the Lehating Mine will be utilised to transport potable, fire water and process water to and from the underground workings.

WATER SUPPLY AND MANAGEMENT

Potable water

Potable water for underground workings will be sourced from the Lehating water supply system. From the potable water tank at the Lehating Mine water will be piped to the underground workings.

Process water

Raw water will be used from process water and sourced from Lehating water supply system. From the process water tank at the Lehating Mine water will be piped to the underground workings. The Khwara project will result in the use of the Lehating water supply system for the planned life of mine

Fire water

A fire water network will be installed underground, which will feed water to hydrants and hose reels. Underground fire water will be sourced directly from the process water tank at the Lehating Mine and will be fitted with both an electrical and diesel engine centrifugal pump. All fire water piping will be dedicated supply pipes not utilized for any purpose other than supplying fire water.

Dewatering

Dewatering is required to make the underground workings safe. All water generated underground will be pumped to underground horizontal settlers from where it is pumped into a water bowser for dust allaying purposes underground. Only once the water inflow exceeds the water demand for dust allaying purposes is water pumped from underground to surface.

GN R704 Compliance

The GN R704 of the NWA regulates the use of water from mining and related activities aimed at the protection of water resources. The GN R704 indicates that no person in control of a mine may carry on any underground activity under a watercourse. In this regard, the proposed Khwara project will include the exploitation of mineral resources under the Kuruman River. It follows that prior to the commencement of any underground mining activities; exemption from GN R704 at a depth of 2050 to 350m will be required from the DWS.

POWER SUPPLY AND USE

Power will be sourced from diesel generators located at the Lehating Mine. Diesel generators at the

Lehating Mine will be used until Eskom is in a position to supply the required power via a dedicated powerline. Thereafter the diesel generators will be retained as a back-up to Eskom power.

MINERALISED WASTE MANAGEMENT

Waste rock

Minimum waste rock is expected to be generated by the proposed project as mining will be carried out on reef via Lehating's underground mine. In the event that waste rock is generated, waste rock will either be loaded into a rear tipper truck and then transported to the waste rock stockpile at the Lehating Mine, or stored underground. The approved Lehating Mine will be able to support any waste rock generated by the proposed project for the short to medium term. It follows that no additional waste rock capacity is required for the proposed project.

Tailings dam

Ore generated by the proposed project will be sent to surface for processing at the Lehating Mine. All -1mm sized material will be pumped for storage at the tailings dam at the Lehating Mine. The approved Lehating Mine's tailings dam will be able to support the proposed project for the short to medium term. It follows that no additional capacity is required as part of the proposed project.

NON-MINERALISED WASTE MANAGEMENT

Hazardous waste

Hazardous and non-hazardous wastes generated by the proposed project will be temporarily handled and stored at the Lehating Mine in the waste management facility before being removed for recycling by suppliers, reuse by scrap dealers or final disposal at appropriately licensed waste disposal facilities.

Sewage

All sewage generated from the proposed project will be treated at the Lehating Mine sewage treatment plant. The sewage treatment plant will have the capacity to treat approximately 16 000 l/day. Treated product will likely be used to enhance the potential of topsoil used at Lehating if authorised. If not the other alternative is to transport the sludge off site to a sewage plant in one of the towns in the region. No additional sewage treatment capacity is required, as the proposed project will not require an increase in employee numbers as discussed in the section below.

EMPLOYMENT AND HOUSING

Employees from the Lehating Mine will be utilised. The Khwara project will allow for the continuation of employment. No new employment opportunities envisaged. No housing will be provided during the operational phase. Operational workers will be accommodated in nearby towns, such as Black Rock, Hotazel, Kathu and Kuruman.

OPERATING HOURS

Underground mining activities will take place 24 hours a day, seven days a week. These operating times will coincide with the Lehating Mine operating times.

LIFE OF MINE

Subject to departmental approval, underground activities will commence in 1st quarter of 2018 with mining activities reaching full production in 2022. The planned life of mine is approximately 10 years.

2.2.2.2 DECOMMISSIONING AND CLOSURE

Decommissioning and closure activities associated with the proposed project will form part of the overall Lehating Mine decommissioning and closure related activities. Decommissioning related activities specific to the proposed project however will include providing underground support. Closure specific activities may include the monitoring of groundwater to manage any latent dewatering risks.

3 POLICY AND LEGISLATIVE CONTEXT

Table 5 below provides a summary of the legislative context and policy applicable to the project.

TABLE 5: LEGAL FRAMEWORK

Applicable legislation and guidelines used to compile the report	Reference where applied	How does this development comply with and respond to the policy and legislative context
Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA) and Regulations	As outlined in Table 6	This applies for a mining right in terms of the MPRDA.
National Environmental Management Act No. 107 of 1998 (NEMA)	As outlined in Table 6	An application for an environmental authorisation in accordance to NEMA has been applied for. The NEMA application was submitted to the Department of Mineral Resources on 12 May 2017. A copy of the application form is attached in Appendix E.
Regulation 984 (Listing Notice 2)	As outlined in Section 2.2.1	
National Water Act No. 36 of 1998 (NWA)	Section 6.8	This applies for the need to obtain a water use license.
Regulation 704 (GN R704) of 1999 in terms of the NWA	Section 2.2.2.1 and 6.8	This applies as exemption in terms of these regulations is required for mining under
Important Bird Areas (2015)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
National Environmental Management: Biodiversity Act No. 10 of 2004 (NEM:BA)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
National Threatened Ecosystems (2011)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
Mining and Biodiversity Guideline (DEA *et al*, 2013)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
National Freshwater Ecosystem Priority Areas 2011 (NFEPA)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
National Biodiversity Assessment (2011)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
National Protected Areas Expansion Strategy 2008 (NPAES)	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA)	Section 6.4.1.5 and 6.3	Biodiversity has been taken into account as part of project planning.
South African National Botanical Institute (SANBI) Integrated Biodiversity Information	Section 6.4.1.5	Biodiversity has been taken into account as part of project planning.
South African Heritage Resources Agency, APM Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports	Section 7.3.1.4	Heritage has been taken into account as part of the project planning.
Northern Cape Planning and Development Act, 1998 (Act No 7 of 1998) or the Spatial Planning and Land Use Management Act No. 16 of 2013,	Section 6.8	Re-zoning application needs to be submitted.
Joe Morolong Local Municipality Integrated Development Plan	Sections 6.4.1.12	Socio-economic conditions have been taken into account as part of project planning.
Joe Morolong Spatial Development Framework	Section 4 and 6.4.1.12	Socio-economic conditions have been taken into account as part of project planning.
John Taolo Gaetsewe District Municipality Integrated Development Plan	Sections 6.4.1.12	Socio-economic conditions have been taken into account as part of project planning.

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 National Environmental Management Act (NEMA) (Act 107 of 1998). The relevant criteria are indicated in Table 6.

TABLE 6: SCOPING REPORT REQUIREMENTS

Scoping report requirement as per the DMR template	Scoping report requirements as per the 2014 NEMA regulations	Reference in the scoping report
The EAP who prepared the report	Details of the EAP who prepared the report.	Section 1.1
Expertise of the EAP	Details of the expertise of the EAP, including curriculum vitae.	Section 1.2 and Appendix A and Appendix B
Description of the property	The location of the activity, including - the 21 digit Surveyor General code of each cadastral land parcel. Where available the physical address and farm name. Where the required information is not available, the coordinates of the boundary of the property or properties.	Section 2.1
Locality plan	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken or on land where the property has not been defined, the coordinates within which the activity is to be undertaken	Section 2.1
Description of the scope of the proposed overall activity, including listed and specified activities	A description of the scope of the proposed activity, including all listed and specified activities triggered.	Section 2.2.1
Description of the activities to be undertaken	A description of the scope of the proposed activity, including a description of the activities to be undertaken, including associated structures and infrastructure.	Section 2.2.2
Policy and legislative context	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Section 3
Need and desirability of the proposed activity	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.	Section 4
Period for which the environmental authorisation is required	-	Section 5
Description of the process followed to reach the proposed preferred site.	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including	Section 6
Details of the alternatives considered	Details of all the alternatives considered.	Section 6.1
Details of the public participation process followed	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs.	Section 6.2

Scoping report requirement as per the DMR template	Scoping report requirements as per the 2014 NEMA regulations	Reference in the scoping report
Summary of issues raised by IAPs	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.	Section 6.3
Environmental attributes associated with the sites	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.	Section 6.4
Impacts identified	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 can be reversed, may cause irreplaceable loss of resources and can be avoided, managed and mitigated.	Section 6.5
Methodology used in determining the significance of environmental impacts	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.	Section 6.6
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.	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.	Section 6.7
The possible mitigation measures that could be applied and the level of risk	The possible mitigation measures that could be applied and level of residual risk.	Section 6.8
The outcome of the site selection matrix. Final site layout plan	The outcome of the site selection matrix.	Section 6.9
Motivation where no alternative sites were considered	If no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such.	Section 6.10
Statement motivating the preferred site.	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 6.11
Plan of study for the environmental impact assess process	A plan of study for undertaking the environmental impact assessment process to be undertaken.	Section 7
Description of alternatives to be considered including the option of not going ahead with the activity	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.	Section 7.1
A description of the aspects to be assessed as part of the environmental impact assessment process.	A description of the aspects to be assessed as part of the environmental impact assessment process.	Section 7.2
Description of aspects to be assessed by specialists.	Aspects to be assessed by specialists.	Section 7.3
Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives	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.	Section 7.4
Proposed method of assessing duration significance	A description of the proposed method of assessing duration and significance.	Section 7.5

Scoping report requirement as per the DMR template	Scoping report requirements as per the 2014 NEMA regulations	Reference in the scoping report
The stages at which the competent authority will be consulted	An indication of the stages at which the competent authority will be consulted.	Section 7.6
Particulars of the public participation process with regard to the impact assessment process that will be conducted.	Particulars of the public participation process that will be conducted during the environmental impact assessment process.	Section 7.7
Description of the tasks that will be undertaken during the environmental impact assessment process	A description of the tasks that will be undertaken as part of the environmental impact assessment process.	Section 7.8
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.	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.	Section 7.9
Other information required by the competent authority	Where applicable, any specific information required by the competent authority.	Section 7.10
Other matter required in terms of section 24(4)(a) and (b) of the Act.	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	Section 8
Undertaking regarding correctness of information	An undertaking under oath or affirmation by the EAP in relation to the correctness of the information provided in the report, the inclusion of comments and inputs from stakeholders and interested and affected parties and 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.	Section 9
Undertaking regarding level of agreement	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.	Section 10

4 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

The proposed project site has been based on the presence of an economically mineable resource.

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 (JMLM, September 2012) 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 proposed mine will gain skills in the operation of a mine in keeping with the skills upgrading and development which contributes to the building of the nation. The proposed development will also ensure local economic development through implementation of projects identified in the social and labour plan.

In addition to this, the proposed project 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 proposed project will be provided in the EIA and EMP report.

5 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The life of mine is 10 years.

6 PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

6.1 ALTERNATIVES CONSIDERED

6.1.1 LAND USE OR DEVELOPMENT ALTERNATIVES

Given that no surface infrastructure will be established as part of the proposed project, no layout alternatives are being considered. No mining method alternatives are being considered due to the depth of the ore body. In addition to this, no service/technology alternatives are being considered as approved facilities at the Lehating mine will be utilised. It follows that no alternatives, apart from the "no-go" option, will be considered as part of the proposed project.

6.1.2 THE "NO-GO" ALTERNATIVE

The assessment of this option requires a comparison between the options of proceeding with the proposed project with that of not proceeding with the proposed project. Proceeding with the proposed project attracts potential economic benefits and potential negative environmental and social impacts. Not proceeding with the proposed project leaves the status quo.

6.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

The public consultation process is in accordance with the requirements of Chapter 6 of the EIA Regulations, 2014 and is outlined in Table 7 below. This section describes the information provided to landowners, adjacent landowners, land users, commenting authorities and other interested and affected parties (IAPs) to inform them in sufficient detail of what the proposed project will entail on the land, in order for them to assess what impact the operation will have on them or the use of the land. Details of the public consultation process undertaken for the proposed project are included in Table 7 below.

TABLE 7: PUBLIC CONSULTATION PROCESS

Task	Description
Notification - commenting authorities and IAPs	
DMR pre-application meeting	A pre-application meeting was held with the DMR on 15 November 2016. The purpose of the pre-application meeting was as follows: • To provide an overview of the proposed project • To provide an overview of the environmental assessment process being followed • To provide an overview of the existing status of the environment • To outline and obtain input on impacts identified for the proposed project • To outline the public participation process proposed for the project • To record any comments and issues raised • To obtain clarity regarding technical reporting aspects for the proposed project. A copy of the pre-application meeting minutes is included in Appendix E.
Notification of the land claims commissioner	The land claims commissioner was consulted in order to verify if any land claims have been lodged on portion 2 of the farm Wessels 227 and the remaining extent, portion 3 and 4 of the farm Dibiaghomo 226. A copy of the land claims letter is included in Appendix E.

Task	Description
Social scan	A desktop social scan of areas surrounding the proposed project area was conducted by SLR. The purpose of the social scan was as follows: • To identify relevant surrounding landowners, land occupiers, relevant ward councillor, municipalities, organs of state, commenting authorities and other interested and affected parties • To obtain contact details for IAPs • To identify appropriate communication structures • To inform IAPs of the proposed project, upcoming public consultation process and associated scoping and EIA and EMP process.
Database	The proposed project's public involvement database was developed by sourcing IAPs details relating to landowners and adjacent landowners by means of a deed search. This information was verified during a social scan including a site visit in the surrounding area, 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 E. The database will be updated on an on-going basis throughout the environmental process.
Distribution of background information document (BID)	A Background Information Document (BID) was produced for the proposed project. The purpose of the BID was to inform IAPs and authorities about the proposed project, the environmental assessment process, environmental attributes, possible environmental impacts and means of inputting into the environmental assessment process. A registration and response form was attached to the BID, which provided IAPs with an opportunity to submit their names, contact details and comments on the proposed project. The BID was made available in English and Afrikaans. Copies of the BID and proof of distribution are included in Appendix E.
Site notices	Laminated A2 site notices were placed at key conspicuous positions by SLR in and around the proposed project area on 16 January 2017. A copy of the site notice and the photographic record are included in Appendix E.
Newspaper advertisements	Block advertisements were placed in the Kathu Gazette on 14 January 2017 and the Kalahari Bulletin on 19 January 2017. Copies of the advertisements are included in Appendix E.
Scoping stage meetings	
Public scoping meeting	A general public scoping meeting was held on 27 January 2017. The purpose of the general public scoping meeting was as follows: • To provide an overview of the proposed project • To provide an overview of the environmental assessment process that will be undertaken for the proposed 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 proposed 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 • Agree on the way forward and the logistics for report distribution. A copy of the meeting minutes and associated attendance registers is included in Appendix E.
Commenting authority scoping meeting	A commenting authorities meeting was held on 27 January 2017. The purpose of the meeting was as follows: • To provide an overview of the proposed project • To provide an overview of the environmental assessment process that will be undertaken for the proposed 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 proposed 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 • Agree on the way forward and the logistics for report distribution. A copy of the meeting minutes and associated attendance register is included in

Task	Description
	Appendix E.
Review of scoping report	
Public review of scoping report	The scoping report will be made available for public review (for 30 days) and comment from 18 May 2017 to 19 June 2017 at the following venues agreed to at the scoping meeting: • Joe Morolong Local Municipality • John Taolo Gaetsewe District Municipality • Hotazel, Black Rock and Kathu public libraries • SLR's offices in Johannesburg. Summaries of the scoping report will be made available to all IAPs registered on the public involvement database via email, post and hand delivery (if required). In addition, IAPs will be notified when the scoping report will be available for review via SMS. Electronic copies (CD's) of the scoping report will be made available on request. A full copy of the scoping report will also be made available on the SLR website.
Commenting authority review of scoping report	The scoping report will be made available for review by commenting authorities registered on the IAP database for a period of 30 days from 18 May 2017 to 19 June 2017. Following the review period, the scoping report will be updated to include any comments received from IAPs and commenting authorities during the review of the scoping report. This final scoping report will be submitted for review to the DMR.
Review of EIA and EMP report	
Public review of the EIA and EMP report	Copies of the EIA and EMP report will be made available for public review (for 30 days) at the following venues: • Joe Morolong Local Municipality • John Taolo Gaetsewe District Municipality • Hotazel, Black Rock and Kathu public libraries • SLR's offices in Johannesburg. In addition to this, summaries of the EIA and EMP report will be made available to all IAPs registered on the public involvement database via email, post and hand delivery (if required). In addition, IAPs will be notified when the EIA and EMP report will be available for review via SMS. Electronic copies of the EIA and EMP report will be made available on request. A full copy of the EIA and EMP report will also be made available on the SLR website.
Public feedback meeting (if required)	A public feedback meeting may be held if this is requested by IAPs. The purpose of the public feedback meeting would be to provide IAPs with the opportunity to raise queries on the EIA and EMP report issues in a meeting situation.
Commenting authority review of the EIA and EMP report	Copies of the EIA and EMP report will be made available for review by commenting authorities registered on the IAP database for a period of 30 days. The EIA and EMP report will be updated to include any comments received from IAPs and commenting authorities during the review of the EIA and EMP report. This final EIA and EMP report will be submitted for review to the DMR for decision making purposes. A decision is expected within 107 days.

The relevant commenting authorities, agencies and institutions responsible for the various aspects of the environment, land and infrastructure that may be affected by the proposed project and that are involved in this process are listed below:

- Commenting authorities:
  - Department of Mineral Resources (DMR)
  - Department of Water and Sanitation (DWS)
  - Department of Environment and Conservation (DENC)

- South African Heritage Resource Agency (SAHRA)
- Department of Agriculture and Land Affairs (DALA)
- Department of Agriculture, Forestry and Fisheries (DAFF)
- Department of Rural Development and Land Reform (DRDLR)
- Department of Public Works, Roads and Transport (DPWRT)
- John Taolo Gaetsewe District Municipality
- Joe Morolong Local Municipality
- Ward councillor (Ward 4).

- Parastatals:
  - Telkom
  - Transnet
  - Eskom
- Non-government organisation
  - Tshiping Water Use Association
  - Kalagadi Water User Forum
- Others:
  - Landowners and land users
  - Surrounding mines

6.3 SUMMARY OF ISSUES RAISED BY IAPS

A summary of the issues and concerns raised by IAPs and commenting authorities is provided in Table 8 below. Refer to Appendix E for a copy of the comments received from IAPs and commenting authorities.

TABLE 8: SUMMARY OF ISSUES RAISED BY IAPS AND COMMENTING AUTHORITIES

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
Affected parties				
Landowners or lawful occupiers on adjacent properties				
Ryno van Schalkwyk – Adjacent landower	X	Comments raised at public meeting held on 27 January 2017	Will dust be generated?	It is unlikely that the Khwara project will generate dust. Dust generation will however take place at the Lehating Mine. It is however important to note that the approved Lehating Mine EMP makes provision for the management of dust.
			If you mine under the river bed, won't it damage our groundwater?	As part of the proposed project, an independent groundwater specialist has been appointed to assess the impact that the proposed project will have on groundwater. The related terms of reference are included in Section 7.3.1.3.
			The Kuruman River actually flowed last year upstream from here. It flowed for around 2 weeks.	This had been noted
Sylvia Makoele - Hotazel Manganese Mines (Pty) Ltd – adjacent mine	X	Comments raised at public meeting held on 27 January 2017	Tarring the R380 as part of the social and labour plan should be considered.	Thank you for your input. This will be considered by Khwara as part of project planning.
			What is the relationship between Lehating and Khwara?	Lehating and Tshipi (Currently known as Khwara) are separate mining companies. The intension is to form a joint mining venture that will result in one entity known as Khwara Manganese Mining (Pty) Ltd.
			Will you be operating under two mining rights?	Initially yes. Until the two mines are joined, each mine will have to obtain their own authorisations.
			Are there existing boreholes on the property that will be utilised?	Yes, for monitoring purposes.
			Will you need access to neighbouring farms to access the boreholes?	Yes, access to private property will be required to monitor the groundwater level.
			Will the property boundaries be the same on the surface as it is underground? The Wessels Mine is located to the south of the Khwara project area. Will mining extend towards the southern boundary of the project area near the Wessels Mine?	No, the ore body does not extend to the far south of the Khwara project area.
Organs of state (Commenting authorities)				
South African Heritage Resources Agency				

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
Natasha Higgitt	X	Comments received on 16 January 2017 via the SAHRIS website	Thank you for notifying SAHRA of the proposed Mining Right Application on portion 2 of the farm Wessels 227 and the remaining extent and portion 3 and 4 of the farm Dibiaghomo 226, north of Black Rock in the Northern Cape Province. In terms of the National Heritage Resources Act, no 25 of 1999 (NHRA), heritage resources, including archaeological or palaeontological sites over 100 years old, graves older than 60 years, structures older than 60 years are protected. They may not be disturbed without a permit from the relevant heritage resources authority. This means that before such sites are disturbed by development it is incumbent on the developer to ensure that a Heritage Impact Assessment (HIA) is done as per Section 38(8) of the NHRA. This must include the archaeological component (Phase 1) any other applicable heritage components. The HIA must be conducted as part of the Environmental Impact Assessment (EIA) phase of the Environmental Authorisation Application in terms of the National Environmental Management Act, No 107 of 1998 (NEMA) and the NEMA EIA Regulations 2014 for activities that trigger the Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA)(As amended). The quickest process to follow for the archaeological component would be to contract a specialist (see www.asapa.org.za) to provide a Phase 1 Archaeological Impact Assessment Report. The Phase 1 Impact Assessment Report will identify the archaeological sites and assess their significance. It should also make recommendations (as indicated in section 38 of the NHRA) about the process to be followed. For example, there may need to be a mitigation phase (Phase 2) where the specialist will collect or excavate material and date the site. At the	A desktop palaeontological assessment will be undertaken for the proposed project. The related terms of reference is included in Section 7.3.1.4. The proposed Khwara project will not require the establishment of any surface infrastructure as the underground resource will be accessed via the neighbouring Lehating Mine shaft. It follows that a HIA was not identified as a specialist investigation required for the project as there will be no surface disturbance associated with the Khwara Mine.

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			end of the process the heritage authority may give permission for destruction of the sites. If the property is very small or disturbed and there is no significant site the specialist may choose to send a letter to the heritage authority to indicate that there is no necessity for any further assessment. Where bedrock is to be affected, or where there are coastal sediments, or marine or river terraces and in potentially fossiliferous superficial deposits, a Palaeontological Desk Top study must be undertaken to assess whether or not the development will impact upon palaeontological resources - or at least a letter of exemption from a Palaeontologist is needed to indicate that this is unnecessary. If the area is deemed sensitive, a full Phase 1 Palaeontological Impact Assessment will be required and if necessary a Phase 2 rescue operation might be necessary (see www.palaeontologicalsocitey.co.za for qualified paleontologists). Any other heritage resources that may be impacted such as built structures over 60 years old, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict, and cultural landscapes or viewscapes must also be assessed. Please note that all Environmental Reports (Scoping Report and EIA) with all appendices must be submitted to the SAHRIS Case file in order for an informed comment to be issued.	
Department of Agriculture, Forestry and Fisheries				
Jacoline Mans	X	Comments received on 19 January 2017 via email.	Please register the Department of Forestry as a commenting authority and provide copies of the EIA document to this office. Kindly note that documents cannot be downloaded via dropbox links. Please send the reports by CD or email (maximum size of 4MB per mail).	The Department of Agriculture, Forestry and Fisheries, has been registered as an interested and affected party and is included on the project database. SLR will send you a copy of the scoping report and EIA and EMP report via CD.
			Consideration should be given to the potential impacts on protected trees (if any). Dust and	As part of the proposed project an independent biodiversity specialist has been appointed to

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			dewatering may affect the long term survival and health of deep – rooted tree species such as the Camel thorn (*Vachellia erioloba)* or Shephard's trees (*Boscia albitrunca).*	determine the impact that the proposed project will have towards the floral environment. The related terms of reference for the biodiversity study is included in Section 7.3.1.1.
			The Northern Cape Nature Conservation Act, Act 9 of 2009 (NCNCA) administered by the provincial Department of Environmental and Nature Conservation must also be consulted, to assess potential impacts on provincially protected plant and animal species, which may not be disturbed without a valid Fauna or Flora permit.	The proposed project will not require the establishment of any surface infrastructure. It follows that it is unlikely that permits will be required for the disturbance of plant and animal species. This will however be verified with input from the independent biodiversity specialist.
Jacoline Mans	X	Comments raised at commenting authorities meeting held on 27 January 2017	Are Lehating Mining (Pty) Ltd (Lehating) and Tshipi é Ntle Manganese Mining (Pty) (Tshipi) Ltd owned by the same people?	No, Lehating and Tshipi (currently known was Khwara) are separate mining companies. A joint mining venture agreement has been drawn up and agreed upon between the two parties. The conditions precedents have not been met as yet.
			We are concerned that the presentation indicates that there will not be an impact on terrestrial plant and animal life. We acknowledge that emphasis is made to the impact on deep rooted trees as a result of dewatering; however a loss in the condition of these trees such as the Camel Thorn will impact on other plant species and animals dependant on these trees for survival.	As part of the proposed project an independent biodiversity specialist has been appointed to determine the impact that the proposed project will have towards the floral environment. The related terms of reference for the biodiversity study is included in Section 7.3.2. Further information will be provided in the EIA and EMP report.
			It is suggested that a monitoring system is put in place to monitor the condition of the deep rooted trees when mining commences. The particular area of concern will be the cone of depression zone, however if it is possible to extend the monitoring area further than the cone of depression zone this would be ideal. Please can these monitoring reports be made available to the Department of Agriculture, Forestry and Fisheries and the Department of Environment and Nature Conservation on an annual basis?	The implementation of a monitoring system will be considered as part of the independent biodiversity impacts assessment. The related terms of reference for the biodiversity study is included in Section 7.3.2. Further information will be provided in the EIA and EMP report.
			In the event that dewatering activities will impact on the deep rooted plants, Tshipi (currently known as Khwara) could consider watering the plants.	The implementation of project management measures will be considered as part of the independent biodiversity impacts assessment. The related terms of reference for the biodiversity study

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
				is included in Section 7.3.2. Further information will be provided in the EIA and EMP report.
			It is recommended that the biodiversity specialists needs to undertake an aquifer dependant ecosystem investigation. This is of particular concern as the project is located in the Kathu Bushveld. A similar study was undertaken for the United Manganese of Kalahari (UMK) Mine by Natalie Birch. It is suggested that you contact her to obtain a copy of the report that was compiled for UMK.	Thank you. SLR has worked with Natalie Birch and we will contact her to obtain a copy of the aquifer dependant ecosystem report compiled for UMK.
			Please ensure that we receive electronic copies of the scoping and EIA and EMP reports.	This will be done.
			The presentation indicates that the lower manganese body will be targeted. How deep is this ore body?	The lower manganese ore body ranges in depth between 250 to 350m below ground level.
Department of Environment and Nature Conservation				
Samantha Fontaine	X	Comments raised at commenting authorities meeting held on 27 January 2017	Please ensure that we receive electronic copies of the scoping and EIA and EMP reports.	This will be done.
Ward Committee – Ward 4				
Joe Masela	X	Comments raised at commenting authorities meeting held on 27 January 2017	You said that the venues for report viewing will also be confirmed this afternoon with input from the general public? Is there another meeting this afternoon and how does it differ from this meeting?	A general public meeting was held at the recreational Hotazel club at 16h00 on 27 January 2017. The same information was presented at both the commenting authorities and the public meetings. The reason for holding a commenting authorities meeting in the morning is to accommodate officials who need to drive from Upington and Kimberly. The general public meeting is held much later in the day to accommodate working people and farmers who can only attend meetings after work. At the general public meeting, IAPs were given the opportunity to agree on the suggested venues for the placement of the scoping and EIA and EMP reports for public review and to suggest additional venues if needed.
			This project concerns me. There are no employment	Your concern has been noted. It is important to

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			opportunities.	note that while this is the case for the proposed project, the Lehating Mine still needs to be established. When this mine is established, job opportunities will become available. The benefit of the Khwara project is that it will allow for the continuation of jobs at the Lehating mine.
			The project is underground, how does the sand not fall in?	The shaft at the Lehating Mine will be constructed by qualified engineers that will ensure that material from surface does not fall into the shaft. It is also important to note that sand will be stripped and stockpiled away from the shaft area.
Lennox Ketong			How will the community benefit from the Khwara project if there are no job opportunities?	A social and labour plan has been compiled for the proposed project. The social and labour plan makes provision for community benefits and upliftment.
Other interested and affected parties				
Chris Schutte from Telkom	X	Comments received via email on 26 January 2017	I hereby inform you that our Client (Telkom SA SOC Ltd) approves the proposed work indicated on your drawings in terms of Section 23 of the Electronic Communication Act No. 36 of 2005 as amended. No infrastructure of our Client (Telkom SA SOC Ltd) will be affected by this proposal. We did our utmost to ensure that we indicated our route as accurate as possible and should you discover any of our cables that is not on the sketch please stop and contact us immediately to arrange a site meeting. Please make use of pilot holes in order not too damage our infrastructure. Although we are not affected by this proposal, Mr Petrus Fourie must be contacted at 081 363 5213 from our Network Field Services before commencement of work. Approval of the proposed route is valid for six months. If construction has not yet commenced within this	The proposed project will not require the establishment of any surface infrastructure and as such any existing Telkom lines will not be disturbed. With reference to Section 6.8, possible mitigation measures identified for the proposed project include: • Notify Telkom of project commencement and completion of the project. • Even though no surface infrastructure will be established as part of the proposed project, in the unlikely event that any Telkom infrastructure is damaged, Telkom will be notified immediately and any damage costs will be handled by Khwara**.**

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			period, then the file must be resubmitted for approval. Any changes/deviations from the original planning during or prior to construction must immediately be communicated to this office. On completion of this project, please certify that all requirements as stipulated in this letter have been met. Please note that should any of our Client (Telkom SA SOC Ltd) infrastructure has to be relocated or altered as a result of your activities the cost for such alteration or relocation will be for your account in terms of Section 25 of the Electronic Communication Act. Please notify our office and forward an as built plan, within 30 days of completion of construction. Should our Client (Telkom SA SOC Ltd) infrastructure be damaged while work is undertaken, kindly call the Toll Free number – 0800203957 – immediately.	
Eben Anthonissen – Agri Kuruman and Kgalagadi Water Users Forum	X	Comments raised at public meeting held on 27 January 2017	What type of substation is being built? Transmission or distribution substation?	A distribution substation will be established at the Lehating Mine.
			From Agri Kuruman and Kglalagadi Water Users Forum's point of view, there should be no negative impacts on anyone if the project goes ahead. The Kuruman river is the border between the Lehating Mine and the Khwara Mine. To the east there is the Ga-Magara River. Why is it necessary to dewater the mine and recycle the water within the system when this water could be pumped back underground to recharge the aquifers? From a sustainability perspective, water upstream from the mine should be abstracted and re-introduced to the aquifers downstream of the project area. This would eliminate the need for mines to dewater.	Thank you. Your comment has been noted and will be taken into consideration as part of project planning by Khwara.
			Since this project only allows for the extension of the life of the Lehating Mine, with no more job opportunities, why does the mine need to be developed?	The project is economically viable.

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			Has the cumulative effects of the surrounding mines been taken into account?	As part of the proposed project, an independent groundwater specialist has been appointed to assess the impact that the proposed project will have on groundwater. The related terms of reference are included in Section 7.3.4. It is however important to note that a hydrocensus was undertaken for the proposed project to characterise the existing groundwater quality and quantity prior to the commencement of the project. From a cumulative perspective, the hydrocensus characterises the current baseline condition taking into account the effects that existing mining operations have had towards groundwater quality and quantity. Further to this, the groundwater model that will be developed for the proposed project, will take into consideration the impacts associated with the approved Lehating Mine.
			The R380 near the project area is currently a gravel road. As part of the Lehating Mine, what is the intention around possible upgrades of this road?	The approved EIA and EMP report for the Lehating Mine makes provision for the establishment of an intersection from the R380 for both a tarred and gravel scenario. It is however understood that the decision to tar the R380 sits with the Northern Cape Department of Roads and Public Works. The approved EIA and EMP report for the Lehating Mine does not commit the mine to tar the R380.
			Are Lehating Mining (Pty) Ltd (Lehating) and Tshipi é Ntle Manganese Mining (Pty) (Tshipi) Ltd managed by the same company?	Lehating and Tshipi (Currently known as Khwara) are separate mining companies. The intension is to form a joint mining venture that will result in one entity known as Khwara Manganese Mining (Pty) Ltd.
			How can two mining companies operate as a joint venture with existing authorisation under different companies?	All existing authorisations will need to be consolidated under Khwara Manganese Mining (Pty) Ltd. This may require amendment processes to be undertaken.
Verlaine Kakedeffo – United Manganese of Kalahari (Pty) Ltd	X	Comments raised at public meeting held on 27 January 2017	How far is the Lehating Mine from here?	It is about 30km from the town Hotazel.
			No alternatives were considered. Is that due to the current economic situation? What was the reason underground mining was considered instead of open	The cost of stripping the waste material makes open cast mining very expensive and not feasible to the project. The stripping ratio would be about

Interested and affected parties		Date comments received	Issues raised	EAPS response to issues (as amended for the purposes of the scoping report)
			pit?	1:50.
			What is the slope of the ore body?	The gradient is less than 13 degrees.
			Where will the waste rock be stored?	Mining will take place on reef and as such, it is unlikely that the Khwara component will generate waste rock. Waste rock will be generated during the establishment of the Lehating Mine. This waste rock will be stored on surface at the Lehating Mine in line with Lehating's approved EMP.
Gert Theart – Surrounding landowner	X	Comments raised at public meeting held on 27 January 2017	The removal of ore from the mine, how will that take place?	Once the ore has been removed from underground, it will form part of the Lehating Mine operations, and will be removed from the mine in the same way as the ore from the Lehating Mine operations will be removed, which is a combination between road and rail.
			This is essentially an extension of the Lehating mine, so most of the environmental aspects listed in the BID are not applicable. This should be one project.	Environmental attributes that are typically influenced by mining in general was provided in the BID for completeness purposes. It is however important to note that not all the environmental attributes discussed in the BID will be impacted by the Khwara project. The BID outlined the possible impacts associated with the Khwara project. For a discussion around potential impacts associated with the proposed project, refer to Section 6.7. In terms of the process being followed, this was requested by the DMR.
			Groundwater level is high, but the recharge is slow.	As part of the proposed project, an independent groundwater specialist has been appointed to assess the impact that the proposed project will have on groundwater. The related terms of reference are included in Section 7.3.1.3.

X = indicates IAPs that were consulted

6.4 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITE

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.

It is important to note that for completeness purposes, all environmental attributes are discussed in the section below even though it is unlikely that all environmental attributes will be influenced by the proposed project given that no surface infrastructure will be established. Where environmental attributes are unlikely to change this has been indicated in the section below.

6.4.1 TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED 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 paleontological resources in the rock strata
- The potential for contaminant generation.

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

Groundwater aspects are discussed in section 6.4.1.7 and paleontological resources in section 6.4.1.11.

DATA SOURCES

Information in this section was sourced from the mine works programme for the proposed project.

RESULTS

Regional geology

The proposed project site is located in the Kalahari Basin which is a Manganese Hotazel Iron formation. The Kalahari Formation is approximately 80m thick and overlies the Dwyka Formation. The Dwyka Formation is approximately 200m thick and overlies the Hotazel Formation. The manganese ore body is located within the Hotazel Formation. The Hotazel Formation is approximately 20m metres thick in the area of investigation and overlies the Ongeluk Formation. There are also two distinct topographic highs formed by the rocks of the Olifantshoek Supergroup outcrop approximately 30km southwest of the mine and the rocks of the Asbestos Hill Subgroup outcropping approximately 20km towards to the east of the proposed site location (SLR, September 2013).

Local geology

The Kalahari Formation consists of various units and constitutes the most extensive body of terrestrial sediments from the Cenozoic age in Southern Africa. Throughout the area the thickest parts of the Kalahari Formation appear to coincide with the occurrence of rocks of the Dwyka Group. The presence of faulting and graben formation in pre-Kalahari rocks also has a strong influence on the distribution of the Kalahari sediments. The overall lithology and main stratigraphic units of the Kalahari Formation are represented in Figure 4. With reference to Figure 4 the following applies:

- The Wessels Formation forms the base of the Kalahari formation and is characterized by clayey gravel. Thicker and better-developed clayey gravel of this formation is located in deeper palaeo-valleys and doesn't occur extensively where the Kalahari formation is at its thickest.
- The Budin Formation consists mostly of red and brown calcareous clays, which were possibly deposited in shallow saline lakes. It may also consist of thin pebble layers near its base.
- The Eden formation consists mainly of red, brown or yellowish sandstone with thin pebble layers. This formation becomes more disaggregated and calcified towards the top and was probably deposited from braided streams.
- The Mokalanen Formation can be divided into a sandy limestone and overlying conglomerate with a calcareous mixture. This formation reflects more arid depositional conditions than the underlying fluvial conditions.
- The Obobogorop Formation is characterized by pebble and boulder clasts consisting of calcrete. These clasts are derived from the weathering of Dwyka tillites.
- The Gordonia Formation consists of red aeolian sands (windblown sands / dunes) and rounded quartz grains coloured by a thin coating of hematite. The hematite is absent in river bottom areas subject to hydromorphic influences, where the sand is white in colour. The Gordonia Formation rests directly on pre-Kalahari bedrock, namely Karoo sediments. The Gordonia Formation originates from local sources with some additional material transported into the basin over short distances. Aeolian overprinting of sands originally deposited by streams and sheet wash is evident in some areas. Linear dunes, stabilized by vegetation, characterize the Gordonia Formation.

6.4.1.2 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
- 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 through the establishment of infrastructure can alter all of the above-mentioned aspects of the environment. It is however important to note, that since the proposed project will not require the establishment of any surface infrastructure, the current topographical baseline environment will remain unchanged. This section however does provide a brief description of the site topography for completeness purposes.

DATA SOURCES

Information in this section was sourced from the project team and topographical maps.

RESULTS

The general area surrounding the proposed project area is characterised with relatively flat with gentle slopes with the Koranna Berg mountain range located to the south west of the proposed project area respectively (Figure 11). Isolated wetlands are scattered to the south and north of the proposed project area (Figure 1).

The proposed project area is located in a relatively flat area with gentle slopes to the North East. The elevation on site varies from 990 m to 1107 m above mean sea level (mamsl).The Kuruman River is located on the north-eastern boundary of the proposed project site (Figure 2).

6.4.1.3 CLIMATE

INTRODUCTION

Climate can influence the potential for environmental impacts and related design associated with mining project 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.

The proposed project will not require the establishment of any surface infrastructure. It follows that specific issues that are usually associated with mining operations is not applicable for the proposed project. This section however does provide a brief description of the existing climatic environment for completeness purposes.

DATA SOURCES

Information in this section was sourced from the EIA and EMP report for the Lehating mine prepared by SLR (SLR, September 2013).

RESULTS

Regional climate

The proposed 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 (SLR, September 2013).

Rainfall

The mean annual precipitation (MAP) for the site is more than 300 mm/year. The mean annual rainfall measured at the nearby Winton (40km away) and Milner (17km away) weather stations ranges between 330mm and 362mm respectively. 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 9 below (SLR, September 2013).

TABLE 9: SUMMARY OF MONTHLY RAINFALL FOR THE PROPOSED PROJECT SITE (SLR, FEBRUARY 2013)

Month	Rainfall (mm)	
	Winton - 392148 w	Milner - 393083 w
January	62.1	66.1
February	61.2	61.4
March	58.0	66.4
April	31.8	35.5
May	13.9	16.1
June	4.2	6.0
July	2.5	1.9
August	4.9	4.2
September	6.2	6.2
October	16.2	19.0
November	25.7	32.0
December	43.3	46.8
Annual	330.1	361.6

Evaporation

The WR2005 (2009) shows a range in annual evaporation for the site of greater than 2118mm (A-Pan estimate). A correction factor of approximately 0.65 (based upon the annual average for monthly correction factors) allows for the translation of the A-Pan estimate to the evaporation estimate for a very shallow body of water (Lake), equivalent to 1375mm. A summary of the adopted evaporation data for the proposed project area is provided in Table 10 below which indicates that the proposed project area is characterised by high evaporation rates (SLR, September 2013).

TABLE 10: SUMMARY OF EVAPORATION DATA (SLR, FEBRUARY 2013)

Months	Mean monthly a-pan evaporation (mm)	Mean monthly lake evaporation (mm)
January	259.0	169.7
February	208.4	144.9
March	161.3	112.1
April	122.3	83.9
May	113.2	76.8
June	82.5	56.1
July	99.1	63.3
August	131.2	81.8
September	188.5	109.9
October	236.3	135.9
November	243.6	157.8
December	272.7	183.3
Total	**2118.1**	**1375.7**

Temperature

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 (SLR, September 2013).

Wind

The prevailing wind direction at the proposed project site is in a north easterly direction with significant winds also blowing from the south east. The strongest winds are in excess of 7m/s primarily during the autumn. During the summer, autumn and winter months, winds from the north-easterly sector dominates. Calm conditions occur the most during summer and autumn months. In spring, wind flow is predominant from the south-south-easterly and southerly sectors, with an increase in frequencies of occurrence of winds greater than 5 m/s being evident. During autumn, the winds blow less frequently from the westerly and south-westerly sectors than in summer and spring (SLR, September 2013).

6.4.1.4 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
- 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. The land capability of an area is based on the soil properties and related potential to support various land use activities.

Soil resources are vulnerable to pollution, erosion and compaction. It is however important to note, that since the proposed project will not require the establishment of any surface infrastructure, the current soil and land capability baseline environment will remain unchanged. This section however does provide a brief description of the site soil and land capability for completeness purposes.

DATA SOURCES

Information in this section was sourced from the soil study undertaken by ARC-Institute for Soil, Climate and Water (ARC-ISCW, May 2013) for the approved Lehating Mine EIA and EMP report (SLR, September 2015).

RESULTS

Soil forms

The soil forms located within the proposed project area include Hutton and Clovelly. These soil types are structureless, deep (>1 200 mm) sandy loamy soils that are characterised by high infiltration rates and low clay content which means that these soils are susceptible to both wind and water erosion.

Land use capability

The Hutton and Clovelly soil forms are classified as having a grazing land use capability in terms of the Soil, Climate and Water Land Capability Classification System for South Africa (Schoeman et al, 2000).

6.4.1.5 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.

Project-related activities, in particular dewatering, have the potential to result in a loss of habitat through a lowering of water levels, thereby reducing the occurrence of fauna and flora on site and in the surrounding areas.

The baseline information on biodiversity in the proposed project area will be used to identify sensitive areas, and to guide the project planning to determine how best to conserve the fauna and flora in the area. A brief description of fauna and flora located within the proposed project area is provided below. More detailed information will be provided in the EIA and EMP report.

DATA SOURCE

Information in this section was sourced from the biodiversity study being undertaken for the proposed

project by Scientific Aquatic Services CC (SAS, October 2016) and the biodiversity study undertaken for the Lehating Mine (EMS, July 2013).

RESULTS

Flora (Natural plant life)

The southern portion of the proposed project area is situated within the Kathu Bushveld vegetation type, while the northern portion is within the Southern Kalahari Mekgacha and a small area in the east is within the Gordonia Duneveld vegetation types. The distribution of the various vegetation types is illustrated in Figure 5 (SAS, October 2016).

The tree species occurring in the proposed project area that are protected in terms of the National Forests Act of 1998 (Act 84 of 1998) are *Vachellia erioloba* (Camel Thorn), and *Vachellia haematoxylon* (Grey Camel Thorn) (EMS, July 2013).

According to Pretoria Computer Information Systems (PRECIS) there are no floral species of conservation concern within the QDS 2722BB, thus it is expected that no floral species of conservation concern will occur within the proposed project area. However, based on the threatened or protected floral species list provided by the National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA, 2015), several species of conservation concern are expected to occur within the larger provincial region (Table 11) (SAS, October 2016).

TABLE 11: SPECIES OF CONCERN EXPECTED TO OCCUR WITHIN THE NORTHERN CAPE (SAS, OCTOBER 2016)

Scientific Name	Habitat	Growth Form	Threat Status
Cheiridopsis peculiaris	Gravels and shale derived from metamorphic rocks of the Namaqualand Complex	Succulent	CR
Conophytum herreanthus subsp. Herreanthus	Quartz patches	Succulent	CR
Aloidendron pillansii	Succulent Karoo shrubland on dry, rocky dolomite and gneiss hillsides.	Succulent, Tree	EN
Haemanthus granitcus	Namaqualand Klipkoppe Shrubland or Namaqualand Granite Renosterveld.	Geophyte	EN
Lithops dorotheae	Fine-grained, sheared, feldspathic quartzite	Succulent	EN
Aloidendron dichotomum	On north-facing rocky slopes (particularly dolomite) in the south of its range. Any slopes and sandy flats in the central and northern parts of range.	Succulent, Tree	VU
Brunsvigia herrei	Succulent Karoo Shrubland, granitic soils on flats and sometimes in deposits of fairly large stones.	Geophyte	VU
Conophytum bachelorum	Rocky outcrops	Succulent	VU
Conophytum ratum	Spongy quartz soil.	Succulent	VU
Gethyllis grandiflora	Sandy and or stony soils in arid karroid shrubland.	Geophyte	VU
Gethyllis namaquensis	Coastal dunes and gravelly mountain slopes in succulent karoo shrubland.	Geophyte	VU
Brunsvigia josephinae	Heavy clay soils.	Geophyte	VU

Scientific Name	Habitat	Growth Form	Threat Status
Aloe krapohliana	Occurs in the extremely arid northern regions of the Succulent Karoo, on clay, stony (mostly quarzitic) and sandy soils on flats and slopes.	Herb, Succulent	P
Cyrtanthus herrei	Deeply shaded rock ledges on south-facing rocky slopes.	Bulb	P
Sceletium tortuosum	Quartz patches and is usually found growing under shrubs in partial shade.	Succulent	P
Harpagophytum procumbens	Well drained sandy habitats in open savanna and woodlands.	Herb	P

CR= Critically Endangered, EN= Endangered, VU= Vulnerable, P= Protected.

Fauna (Natural animal life)

Farming practises, prospecting and mining activities within and surrounding the proposed project area, have disturbed the local faunal population. Table 12 below indicates the faunal species of concern that are expected to occur within the Northern Cape Province as a whole, based on NEMBA (2013) (SAS, October 2016).

TABLE 12: SPECIES OF CONCERN EXPECTED TO OCCUR WITHIN THE NORTHERN CAPE (SAS, OCTOBER 2016)

Scientific Name	Common Name	Threat Status
Chrysoritis thysbe schloszae	Schlosz's Opal Butterfly	CR
Trimenia malagrida	Scarce Mountain Copper Butterfly	CR
Trimenia wallengrenii	Wallengren's Silver-spotted Copper Butterfly	CR
Bitis schneideri	Namaqua Dwarf Adder	P
Bitis xeropaga	Desert Mountain Adder	P
Bitis caudalis	Horned Adder	P
Lamprophis fiski	Fisk's House Snake	P
Neophron percnopterus	Egyptian Vulture	CR
Neotis ludwigii	Ludwig's Bustard	EN
Ardeotis kori	Kori Bustard	P
Bunolagus monticularis	Riverine Rabbit	CR
Pelea capreolus	Grey Rhebok	P

CR= Critically Endangered, EN=Endangered, P=Protected

Aquatic environment

Two natural wetland features are present within the northern and southern portion of the proposed mining right area in accordance with the National Freshwater Ecosystem Priority Area (NFEPA) (Figure 6). The wetland features are classified by NFEPA to be a floodplain wetland (north) and a flat (south). The wetland feature in the northern portion of the proposed project area is considered by NFEPA to be in an AB wetland condition, hence it is in a good condition, and the wetland feature in the south is heavily modified (Class Z1) (SAS, October 2016).

The Kuruman River is located along the northern portion of the proposed mining right area. According to the NFEPA Database the Kuruman River is considered to be in a largely natural condition (River

Condition and Present Ecological Sate Class B) (SAS, October 2016).

Terrestrial site sensitivity

The section below provides information on the sensitivity of the proposed project area based on existing national and provincial databases. In this regard, Table 13 summaries the sensitivity of the proposed project site (SAS, October 2016).

TABLE 13: SITE SENSITIVITY (SAS, OCTOBER 2016)

Provincial and/or National database	Details
National Biodiversity Assessment (2011)	The latest National Biodiversity Assessment (2011) provides an assessment of South Africa's biodiversity and ecosystems, including headline indicators and national maps for the terrestrial, freshwater, estuarine and marine environments. The NBA 2011 includes a summary of spatial biodiversity priority areas that have been identified through systematic biodiversity plans at national, provincial and local levels (SANBI BGIS). According to the National Biodiversity Assessment, the northern portion of the proposed project area falls within a moderately protected area, whereas the southern portion falls within an area that is currently not protected as indicated in Figure 7.
National Threatened Ecosystems (2011)	The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEMBA) provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable or protected. Threatened ecosystems are listed in order to reduce the rate of ecosystem and species extinction by preventing further degradation and loss of structure, function and composition of threatened ecosystems. The purpose of listing threatened ecosystems is primarily to conserve sites of exceptionally high conservation value (SANBI, BGIS). According to the National Threatened Ecosystems listing, the proposed project area falls within an area that is least threatened.
National Protected Area Expansion Strategy (2009) and the South African Protected Area Database (2016)	The goal of the National Protected Area Expansion Strategy (NPAES) is to achieve cost effective protected area expansion for ecological sustainability and adaptation to climate change. The NPAES sets targets for protected area expansion, provides maps of the most important areas for protected area expansion, and makes recommendations on mechanisms for protected area expansion. According to the NPAES, the proposed project area is not located within or near any protected area within a 5km radius.
Important Bird Areas (2015)	According to Birdlife South Africa, the proposed project area does not fall within or near any Important Bird Areas (IBA), which has been highlighted as important conservation areas within South Africa.
Mining and Biodiversity guidelines (2013)	The Mining Biodiversity Guideline (2012) provides explicit direction in terms of where mining-related impacts are legally prohibited, where biodiversity priority areas may present high risks for mining projects, and where biodiversity may limit the potential for mining. An area in the northern portion of the proposed project area along the Kuruman River is considered to be of Highest Biodiversity Importance according to the Mining and Biodiversity Guidelines as illustrated in Figure 8.
Griqualand West Centre of Endemism	The proposed MRA is situated within the Griqualand West Centre of Endemism which is an area with a high concentration of plant species with very restricted distribution. The Griqualand West Centre of Endemism is one of the 85 centres of endemism and one of 14 centres in southern Africa, and these centres are of global conservation significance. The Griqualand West Centre of Endemism is considered a priority in the Northern Cape, as the number of threats to the area is increasing

Provincial and/or National database	Details
	rapidly and it has been little researched and is poorly understood. Furthermore, this centre of endemism is extremely poorly conserved, and is a national conservation priority. Centres of endemism are important because it is these areas which if conserved would safeguard the greatest number of plant species. Refer to Figure 9.

6.4.1.6 SURFACE WATER

INTRODUCTION

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Included in this are wetland resources. Further detail pertaining to wetland resources is included in Section 6.4.1.5. Project related activities have a potential to alter the sub-surface flow of surface water resources through dewatering activities. Given that no infrastructure will be established as part of the proposed project, loss of run-off contribution to the Kuruman River is not expected.

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 that could be affected by the project and the status of surface water resources in the project area. More detailed information will be provided in the EIA and EMP report.

DATA SOURCES

Information in this section was sourced from the approved EIA and EMP report for the Lehating Mine (SLR, September 2013).

RESULTS

Regional hydrology

The proposed project area falls within the quaternary catchment D41M which has a gross total catchment area of 2 623 km^2, with a net MAR of 2.05 million cubic meters (mcm).

Local hydrology

The Kuruman River is located on the north eastern boundary of the proposed project area. The Kuruman River is ephemeral in nature and as such will only flow during heavy rain events and can be associated with a perched water table.

Surface water quality

No water sampling within the proposed project site has been conducted because there are no permanent surface water features. Given this, no surface water quality data is available.

Surface water users

Due to the ephemeral nature of the Kuruman River, there is no third party reliance on surface water.

6.4.1.7 GROUNDWATER

INTRODUCTION

Groundwater is a valuable resource and is defined as water which is located beneath the surface in rock pore spaces and in the fractures of lithologic formations. Understanding the geology of the area (See Section 6.4.1.1) provides a basis from which to understand the occurrence of groundwater resources. Mining activities such as the development of underground mining areas have the potential to impact on groundwater resources, both to the environment and third party users, through dewatering. It is important to note that given that no surface infrastructure will be established as part of the proposed project, limited groundwater pollution sources exist for the project.

As a baseline, this section provides a brief description of the pre-mining groundwater conditions. More detailed information will be provided in the EIA and EMP report.

DATA SOURCES

Information in this section was sourced from the approved EIA and EMP report for the Lehating Mine (SLR, September 2013).

RESULTS

Presence of groundwater

The proposed project area is underlain by deeply weathered sedimentary rocks (i.e. mainly sandstones). The sedimentary deposit can be classified as an 'intergranular aquifer' system. The primary porosity of the rocks provides the storage capacity with limited groundwater movements while secondary features such as fractures/faults and bedding planes enhance the groundwater flow.

Regionally an unconfined water table aquifer is expected while isolated occurrences of silts and clay units may confine the groundwater flow locally.

Based on the aquifer classification map (Parsons and Conrad, 1998) the majority of study area is regarded as a "poor aquifer" while the aquifer adjacent (west) to the proposed project is regarded as "minor". A summary of the classification scheme is provided in Table 14. It must be noted that within any aquifer, isolated higher yielding zones can be present.

TABLE 14: AQUIFER CLASSIFICATION SCHEME (PARSONS, 1995; PARSONS AND CONRAD, 1998).

Sole source aquifer	An aquifer used to supply 50% or more of urban domestic water for a given area, for which there are no reasonably available alternative sources, should this aquifer be impacted upon or depleted.
Major aquifer region	High-yielding aquifer of acceptable quality water.
Minor aquifer region	Moderately yielding aquifer of acceptable quality or high yielding aquifer of poor quality water.
Poor aquifer region	Insignificantly yielding aquifer of good quality or moderately yielding aquifer of poor quality, or aquifer that will never be utilised for water supply and that will not contaminate other aquifers.

Special aquifer region	An aquifer designated as such by the Minister of Water

Based on the 1:500 000 hydrogeological map sheet, the proposed project area is located on an aquifer classed as a poor aquifer with potential groundwater yields between 0.1L/s and 2L/s.

Groundwater flow

Localised groundwater flow within and around the project area shows a dominant groundwater flow in a north-western direction with slight localised groundwater flow towards the Kuruman River.

Groundwater quality and levels

A hydrocensus was undertaken in September 2016. The hydrocensus indicated that the groundwater levels within and surrounding the proposed project area range from 20 to 70 m below ground level. Refer to Figure 10 for the location of the hydrocensus boreholes. Groundwater quality within and surrounding the proposed project area shows elevated concentrations of electrical conductivity, total dissolved solids, chloride, fluoride, nitrate, manganese and selenium when compared to the South African National Standards 241 of 2015. Further detail on groundwater quality and quantity will be provided in the EIA and EMP report.

Groundwater use

Boreholes in the proposed project area are utilised for domestic purposes or livestock watering.

6.4.1.8 AIR QUALITY

INTRODUCTION

A change in ambient air quality due to mining activities can result in a range of impacts, which in turn, may cause a disturbance to any nearby receptors. It is however important to note, that since the proposed project will not require the establishment of any surface infrastructure the air quality baseline environment will remain unchanged. This section does however provide a brief description of air quality conditions in the area for completeness purposes.

DATA SOURCES

Information in this section was sourced from the EIA and EMP report for the Lehating mine prepared by SLR (SLR, September 2013).

RESULTS

Regional and local air quality

The following sources of emissions were identified as existing contributors to air quality:

- Dust emissions from mining and mineral processing operations
- Vehicle tailpipe emissions-significant primary pollutants emitted by motor vehicles include CO2, CO, hydrocarbons (HCs), NO_x, SO2, particulate matter and lead

- Vehicle entrained dust from paved and unpaved roads
- Household fuel combustion by means of coal and wood
- Biomass and veld burning
- Various miscellaneous fugitive dust sources, including: agricultural activities and wind erosion of open areas.

6.4.1.9 NOISE

INTRODUCTION

Mining projects may cause an increase in ambient noise levels in and around a project site. This may cause a disturbance to any nearby potential receptors. It is however important to note, that since the proposed project will not involve any new surface activities the ambient noise levels within and surrounding the proposed project site will remain unchanged. As a baseline, this section does however provide a brief description of the existing baseline noise environment for completeness purposes.

DATA SOURCE

Information in this section was sourced from the EIA and EMP report for the Lehating mine prepared by SLR (SLR, September 2013). In this regard, data was sourced from previous EIAs compiled by Metago Environmental Engineers (Pty) Ltd, for manganese mines within the area as well as from observations made in the field.

RESULTS

Based on previous noise investigations in the region, the South African National Standards (SANS 10103, 2008) day-time noise rating of 40 dBA and night-time noise rating of 35 dBA for rural areas is expected to be relevant. Site observation and surrounding land uses confirm the rural nature of the area. It should however be noted that levels of noise generated by specific distant sources, such as mines, prospecting and traffic roads, vary by a considerable margin with a change in wind direction and temperature profiles in the lower atmosphere.

6.4.1.10 VISUAL ASPECTS

INTRODUCTION

Mining projects have the potential to alter the landscape character of a site and the surrounding area through the establishment of both temporary and permanent infrastructure. It is however important to note, that since the proposed project will not require the establishment of any surface infrastructure the landscape character will remain unchanged. As a baseline, this section does however provide an understanding of the existing visual character of the project area.

DATA SOURCE

Information in this section was sourced through observations made during site visits.

RESULTS

The project area lies in a flat, open area characterised by semi-arid vegetation and ephemeral drainage lines. Livestock and game farms and associated isolated farmsteads are typical of the region. Mining, prospecting activities and infrastructure are also evident in the region.

Central to the visual character of an area are the concepts of sense of place and scenic quality. Sense of place is informed by the spatial form and character of the natural landscape taken together with the cultural transformations and traditions associated with the historic use and habitation of the area which lend that area its uniqueness and distinctiveness. The scenic quality of the proposed project site and surrounding area is linked to the type of landscapes that occur within an area. In this regard, scenic quality can range from high to low as follows:

- High – these include the natural features such as mountains and koppies and drainage systems
- Moderate – these include agricultural activities, smallholdings, and recreational areas
- Low – these include towns, communities, roads, railway line, industries and existing mines.

Although numerous mining related structures dominate the landscape to the south of the proposed project area and the R380 and a regional powerline traverse the proposed project site, the overall scene is characterised by the Kuruman River and open views of the bushveld. The result is a landscape with a moderate sense of place and a moderate scenic quality.

6.4.1.11 HERITAGE/CULTURAL AND PALAEONTOLOGICAL RESOURCES

INTRODUCTION

This section describes the existing status of the heritage and cultural environment located within the proposed project area. 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. It is however important to note, that since the proposed project will not require the establishment of any surface infrastructure heritage/cultural resources located within the proposed project area will not be affected.

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 publicized (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 SOURCE

Information was sourced from a heritage/cultural and paleontological study undertaken for the farm Wessels 277 and portions 1 and 2 and the remaining extent of the farm Dibiaghomo 226 (PGS, May 2013 and Gideon Groenewald, April 2013).

RESULTS

Heritage resources within the project area include cemeteries and graves, historical farmsteads and structures, and sites dating back to Middle and Late Stone Age, concentrated near the edges of the Kuruman River (PGS, May 2013).

Based on the findings of desktop palaeontological reviews (Gideon Groenewald, April 2013), the palaeontological sensitivity of the proposed project area is found to be low, however there is a possibility that the Hotazel Formation manganese ore body could contain stromatolites. Taking this into consideration it is possible that fossil resources may be found at the proposed project site. 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.

6.4.1.12 SOCIO-ECONOMIC

INTRODUCTION

Mining 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 national, local and regional economies by strengthening the national economy and 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
- A change to the social structure and way of life.

In terms of positive socio-economic contributions, the proposed project will allow for the continuation of positive impacts such as employment.

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

DATA SOURCE

Information in this section was sourced from the Social and Labour Plan, January 2017. As part of the

SLP, socio-economic profile data was sourced from the Joe Morolong Local Municipality (JMLM) Integrated Development Plans, 2016 and the StatsSA community survey 2016.

RESULTS

Population

The average population within the John Taolo Gaetsewe District Municipality (JTGDM) is approximately 242 264 people while the average population within the JMLM is approximately 84 201.

Dwellings

The most dominant type of dwelling utilized within both the JTGDM and the JMLM is a formally constructed house or brick structure. This consists of 86% within the JTGDM and 82% within the JMLM. Traditional dwellings (e.g. hut) are the second highest used dwelling type in the JMLM, while informal dwellings (eg. Shacks) are the second highest used dwelling type in the JTGDM.

Basic services

Despite the relatively formalized housing infrastructure within both the JTGDM and the JMLM, basic services infrastructure appears to be far less formalized. Access to electricity within the JTGDM and the JMLM has increased slightly over the years, from 88% in 2011 to 91% 2016 in the JTGDM and from 83% in 2011 to 90% in 2016 in the JMLM.

The StatSA community survey of 2016 endeavoured to survey the perceptions people have of the quality of basic services delivered to them. In this regard, the rating of the main source of drinking water is rated low given the poor access to water. One of the key challenges for the JMLM and the JTGDM is to bring piped water to every individual house in the area. The JMLM water supply is mostly below average as water is not yet pumped to a high proportion of individual stands. In this regard, 39% of the JTGDM and 8% of the JMLM water supply is above average.

Other challenging areas' pertaining to basic services includes refuse removal, local police services and the quality of local clinics as per the perception of people. In this regard, the following was noted according to the StatSA community survey of 2016;

- Overall quality of refuse removal: 51% of the JTGDM and the JMLM was below average
- Overall quality of local public clinics: 35% of the JTGDM and 37% of the JMLM was below average
- Overall quality of local public hospitals: 47% of the JTGDM and the JMLM was below average
- Overall quality of the local police services: 33% of the JTGDM and 40% of the JMLM was below average.

Education

Overall statistics throughout the JTGDM and JMLM show poor educational profiles which results in a shortage of educated labour. Significant numbers of the population at these levels have received either

no schooling (17.60% of JTGDM and 22.05% of JMLM) or only limited secondary education (15.10% of JTGDM and 8.08% of JMLM).

6.4.2 CURRENT LAND USES

INTRODUCTION

Mining activities have the potential to affect land uses both within the proposed project area and in the surrounding areas. This can be caused by physical land transformation and through direct or secondary impacts. Given that no surface infrastructure will be established as part of the proposed project, no direct impact on land transformation will take place; however, existing land uses may be influenced through 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 report.

DATA SOURCE

Information in this section was sourced from on-site observations and through the review of topographical maps and satellite imagery.

RESULTS

The discussion below should be considered with reference to Figure 11 and Figure 12.

Prospecting Right

Tshipi é Ntle Manganese Mining (Pty) Ltd held a prospecting right (NC30/5/1/1/2/1251PR) for manganese on portion 2 of the farm Wessels 227 and the remaining extent and portion 3 and 4 of the farm Dibiaghomo 226. As part of a Section 11 process in terms of the Mineral and Petroleum Resources Development Act 28 of 2002, the prospecting right was transferred to Khwara Manganese (Pty) Ltd (Khwara) (NC30/5/1/1/2/1251/10837PR) on 23 January 2017.

Land owners within the proposed project area

Landowners located within the proposed project area are outlined in Table 15 below.

TABLE 15: LANDOWNERS LOCATED WITHIN THE PROPOSED PROJECT AREA

Relevant farms	Relevant portion	Landowner
Wessels 227	Portion 2	Ntsimbintle Mining Pty Ltd
Dibiaghomo 226	Portion 3	Ntsimbintle Mining Pty Ltd
	Portion 4	Ntsimbintle Mining Pty Ltd
	Remaining extent	Magdalena Aletta van der Walt

Mining companies

Mining companies with existing and/or proposed operations surrounding the proposed project area include (Figure 11 and Figure 12):

- South 32 (Wessels Mine) – Located approximately 1km south from the boundary of the proposed project area
- Assmang (Pty) Ltd (Nchwaning Mine) – Located approximately 3.4km south from the boundary of the proposed project area
- Assmang (Pty) Ltd (Black Rock Mine) – Located approximately 3.29km south west from the boundary of the proposed project area
- Assmang (Pty) Ltd (Gloria Mine) – Located approximately 6.2km south east from the boundary of the proposed project area
- Kalagadi Manganese (Pty) Ltd (Kalagadi Mine) – Located approximately 10km south east from the boundary of the proposed project area
- Kudumane Manganese (Pty) Ltd (Kudumane Mine) – Located approximately 14km south east from the boundary of the proposed project area
- Sebilo Resources (Pty) Ltd (Sebilo Mine) – Located approximately 21.45km south east from the boundary of the proposed project area
- United Manganese of Kalahari (Pty) Ltd (United Manganese of Kalahari Mine) – Located approximately 22km south east from the boundary of the proposed project area
- Tshipi é Ntle Manganese (Pty) Ltd (Tshipi Borwa Mine) – Located approximately 30km south southeast from the boundary of the proposed project area
- South 32 (Mamatwan Mine) - Located approximately 29km south east from the boundary of the proposed project area

Numerous dormant/closed mines are also located within the area surrounding the proposed project area. These include the following (Figure 11 and Figure 12):

- The old Hotazel Mine located approximately 13km south east from the boundary of the proposed project site
- The old Black Rock Mine located approximately 3.2km north west from the boundary of the proposed project site
- The old Devon Mine located approximately 17km south east from the boundary of the proposed project site
- The old York Mine located approximately 15km south southeast from the boundary of the proposed project area
- The old Middelplaats Mine located approximately 27.95km south southeast from the boundary of the proposed project site.

Solar plant

The Adams Solar Plant (Adams Solar PV Project Two (Pty) Ltd) owned by Enel Green Power (Pty) Ltd is situated approximately 30km south east from the proposed project area and is located on the farm Adams 328. The Adams Solar Plant will aid the new renewable generation capacity of the national grid and contribute to the 42% share targeted by the Department of Energy for renewable energy (Integrated

Resource Plan, 2010-2030). According to the strategy, 8.4 GW of new generation capacity in South Africa will be obtained from the Adams Solar Plant over the next twenty years.

Livestock and game grazing

Livestock grazing currently takes place within the proposed project area. In this regard, Willem Strauss currently leases land on portion 2 of the farm Wessels 227 for ad-hoc grazing. Livestock grazing and game farming takes place surrounding the proposed project area. A farm employee resides in an old farm house on the farm employed by Willem Strauss.

Communities/towns and isolated farmsteads

With reference to Figure 11 and Figure 12 the nearest residential areas include the following:

- The Black Rock community located approximately 2.5km south from the boundary of the proposed project area
- Gloria Mine village located approximately 7km south east from the boundary of the proposed project area
- The Hotazel town situated approximately 12km south east from the boundary of the proposed project area
- Black Rock mine village located approximately 5.4km south from the boundary of the proposed project area
- Isolated farmstead located approximately 2.6km south east from the boundary of the proposed project site on the farm N'chwaneng 267
- Isolated farmstead located approximately 9.4km south west from the boundary of the proposed project site on the farm Olivewood 284
- Isolated farmstead located approximately 10km south from the boundary of the proposed project area on the farm Umtu 281
- Isolated farmstead located approximately 12 km south west from the boundary of the proposed project site on the farm Olivepan 282
- The town Kuruman located approximately 67km to the south east from the boundary of the proposed project area
- The town Kathu located approximately 72km to the south from the boundary of the proposed project area

No informal settlements are located in immediate proximity to the proposed project area.

Regional powerline infrastructure

A regional powerline traverses the western section of the proposed project area (Figure 12).

Regional Telkom line infrastructure

A regional Telkom line runs along the R380 and therefore traverses the western section of the proposed

project site. Given that no surface infrastructure will be established as part of the proposed project, the regional Telkom line will remain undisturbed.

Local Road Network

Existing roads within the vicinity of the proposed project area include:

- The R380 that traverses the proposed project site (refer to Figure 12)
- The tarred closed section of the R31 that runs between Kuruman and Van Zylsrus located approximately 6km south of the proposed project site (Figure 12).

Land claims

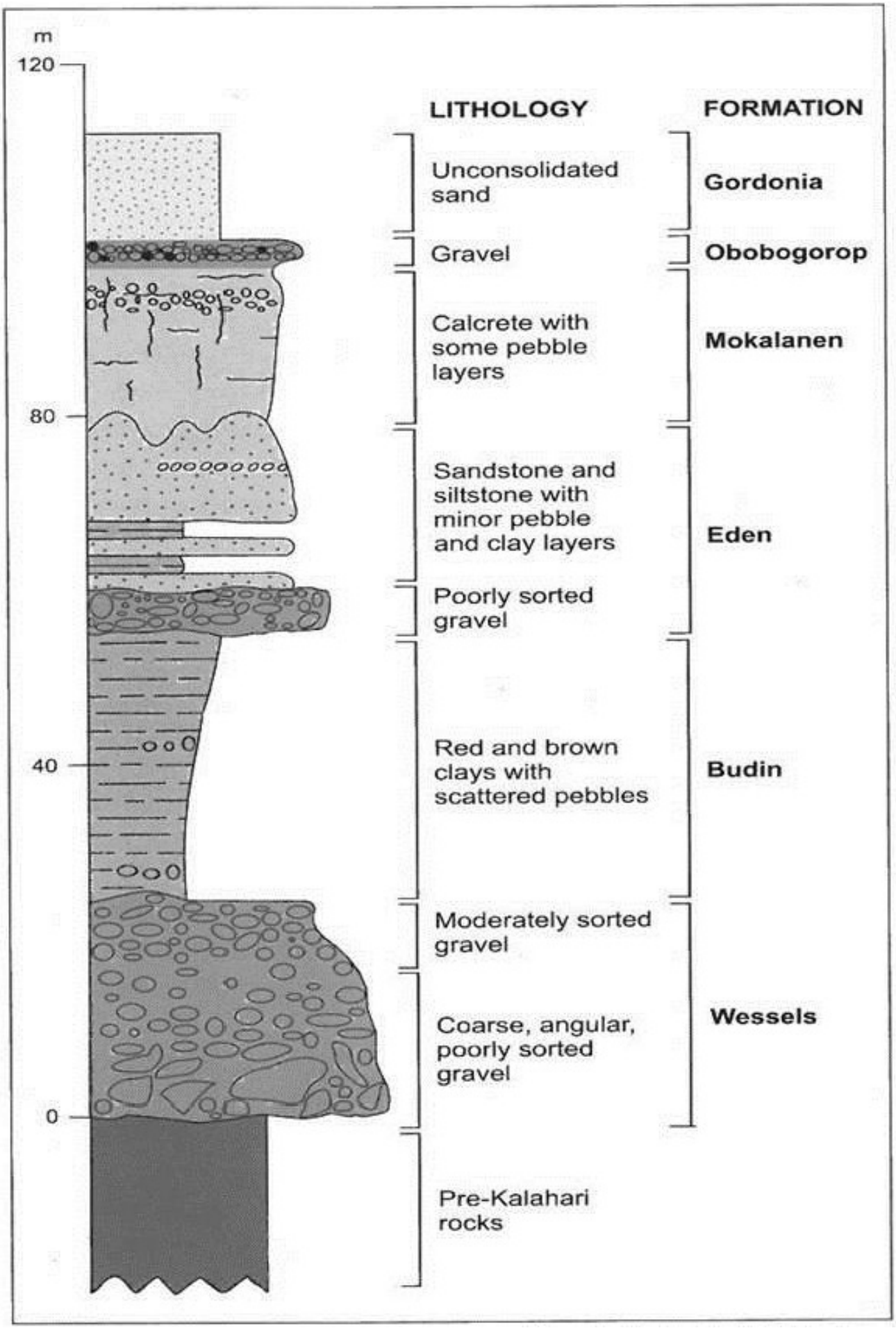
According to the Department of Rural Development and Land Reform: Regional Land Claim Commissioner, no land claims have been lodged on the farms Wessels 227 and Diabiaghomo 226 (Appendix E).

6.4.3 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

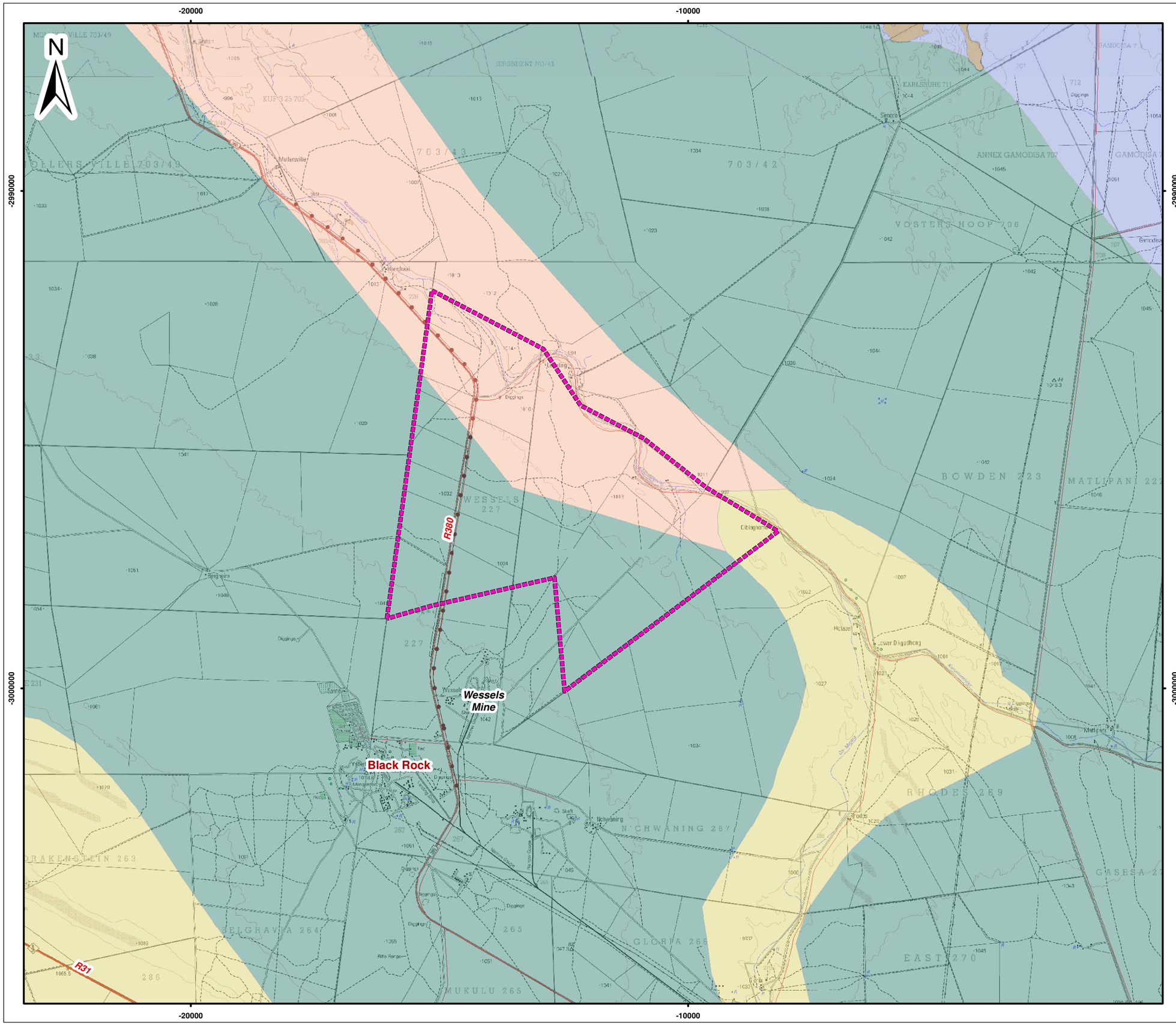
The environmental features in the project area are described in Section 6.4.1 above, however the notable environmental feature is the Kuruman River located on the north-eastern boundary of the proposed project area. The notable infrastructure within the proposed project area is the R380 and Powerline that traverses the proposed project site.

6.4.4 ENVIRONMENT AND CURRENT LAND USE MAP

Environmental maps are shown in Figure 4 to Figure 9. A conceptual map showing topographical information as well as land uses on and immediately surrounding the proposed project area is provided in Figure 11 and Figure 12. This may be refined during the EIA and EMP report Phase.



GENERALIZED STRATIGRAPHIC OF THE KALAHARI FORMATION)	01/2017 720.12015.00004	FIGURE 4



Legend

- Proposed Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines

Vegetation Types

- Gordonia Duneveld
- Kathu Bushveld
- Kuruman Thornveld
- Southern Kalahari Mekgacha
- Southern Kalahari Salt Pans

0 1 2 Kilometers

Scale: 1 : 74 000 @ A3
Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 5

Vegetation Types (SAS, October 2016)

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

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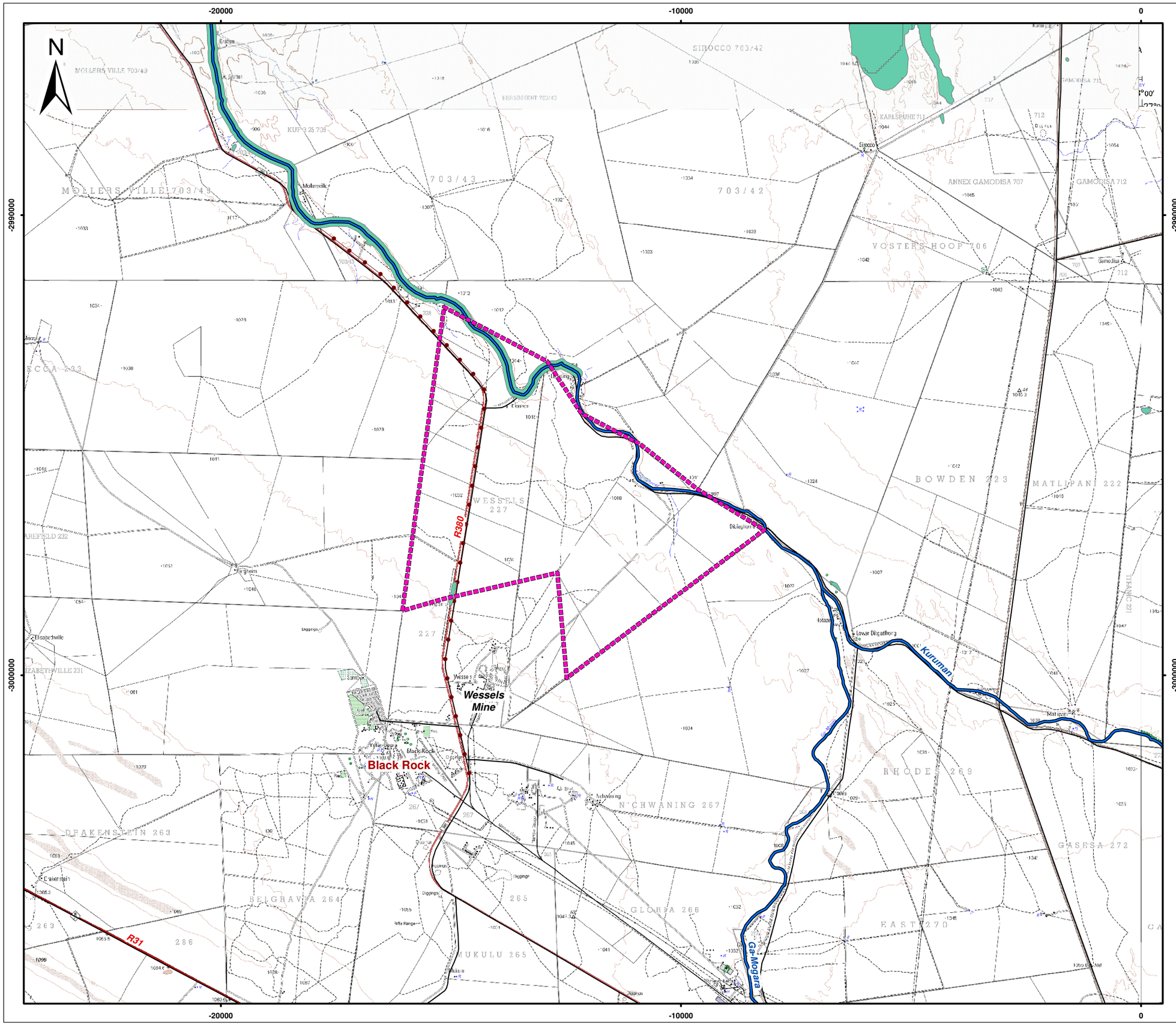

Khwara Manganese (Pty) Ltd

Figure 6

NFEPA Rivers and Wetlands

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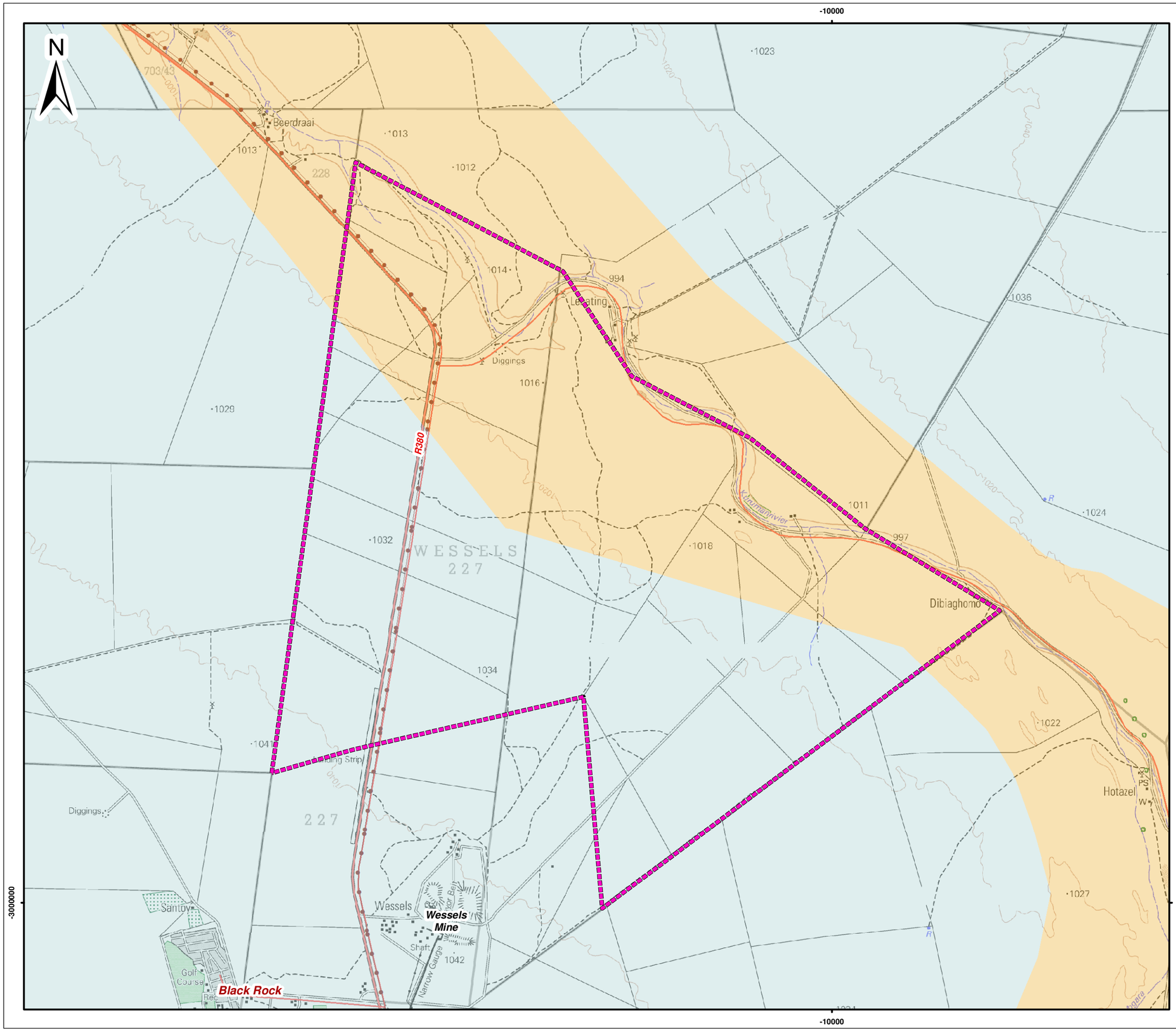

Legend

- Proposed Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines

Protection Level

- Moderately Protected
- Not Protected

0 1 Kilometers

Scale: 1 : 40 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 7

National Biodiversity Assessment (SAS, October 2016)

SLR Consulting (Africa) (Pty) Ltd
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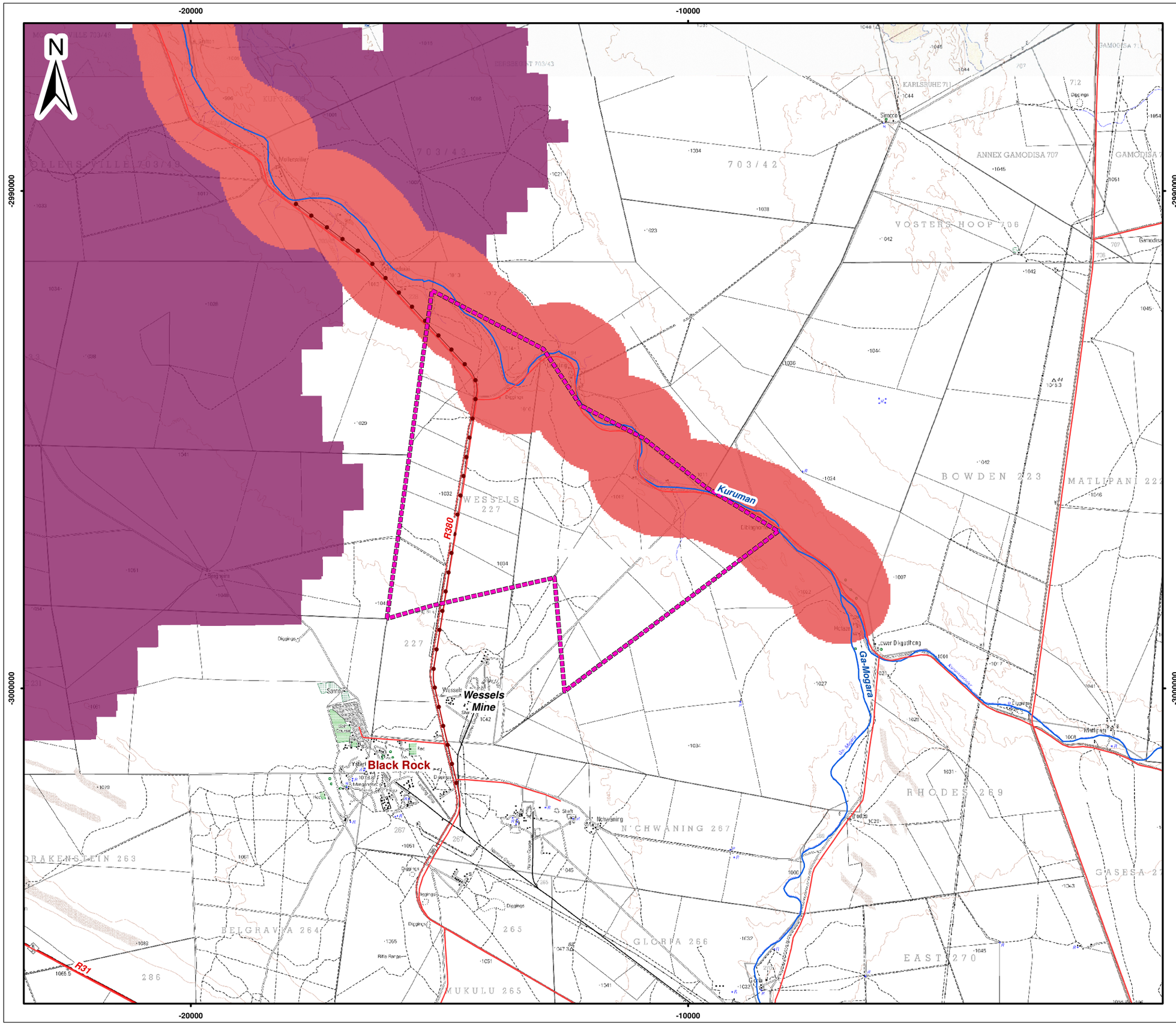
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

720.12015.00004 | January 2017



Legend

- Proposed Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines

Mining Biodiversity Guidelines

- B. HIGHEST BIODIVERSITY IMPORTANCE - Highest Risk for Mining
- D. MODERATE BIODIVERSITY IMPORTANCE - Moderate Risk for Mining

0 1 2 Kilometers

Scale: 1 : 74 000 @ A3
Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 8

Mining Biodiversity Guidelines

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

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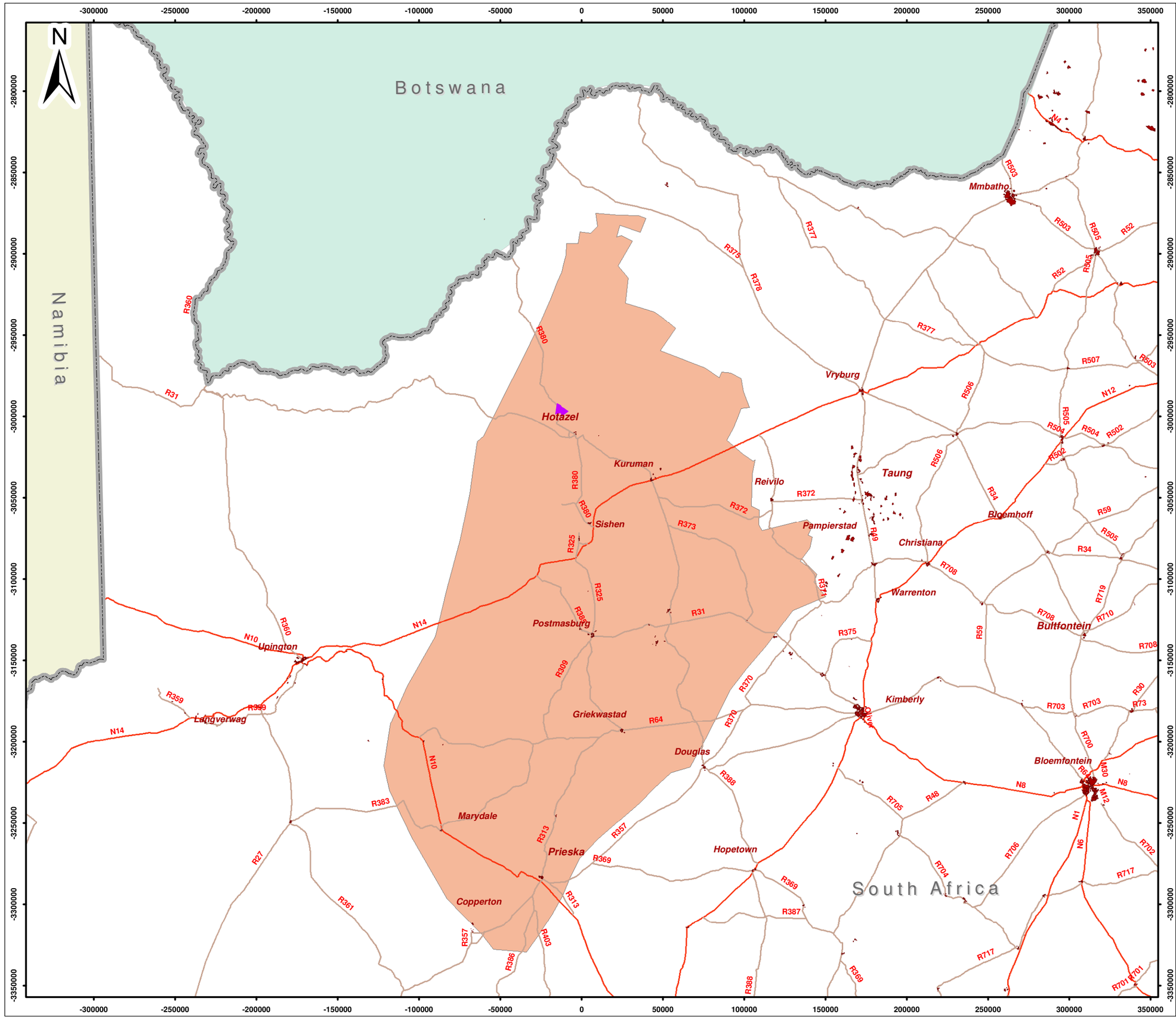

Legend

- Khwara Manganese (Pty) Ltd
- National Boundary
- National Roads
- Route Roads
- Urban Areas
- Griqualand West Center Endemism

0 30 60 Kilometers

Scale: 1 : 2 250 000 @ A3

Projection: Transverse Mercator

Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 9

Griqualand West Center of Endemism (EMS, June 2014)

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

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January 2017

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N

MOLLERS VILLE 703/49

703/43 703/42 KUP 3 25 709

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BOER 07 BOER 06 BOER 06 ALT

VDM 01 DW 10 ELIZ 01

Kuruman R380

Black Rock Wessels Mine

MOLLERS VILLE 703/49 · MECCA 233 · HAREFIELD 232 · ELIZABETHVILLE 231 · WESSELS 227 · N'CHWANING 267 · DRAKENSTEIN 263

Legend

- Proposed Mining Right Area
- Approved Lehateng Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Hydrocensus Boreholes

0 0.5 1 2 Kilometers

Scale: 1 : 59 500 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Khwara Manganese (Pty) Ltd

Figure 10

Hydrocensus Boreholes

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

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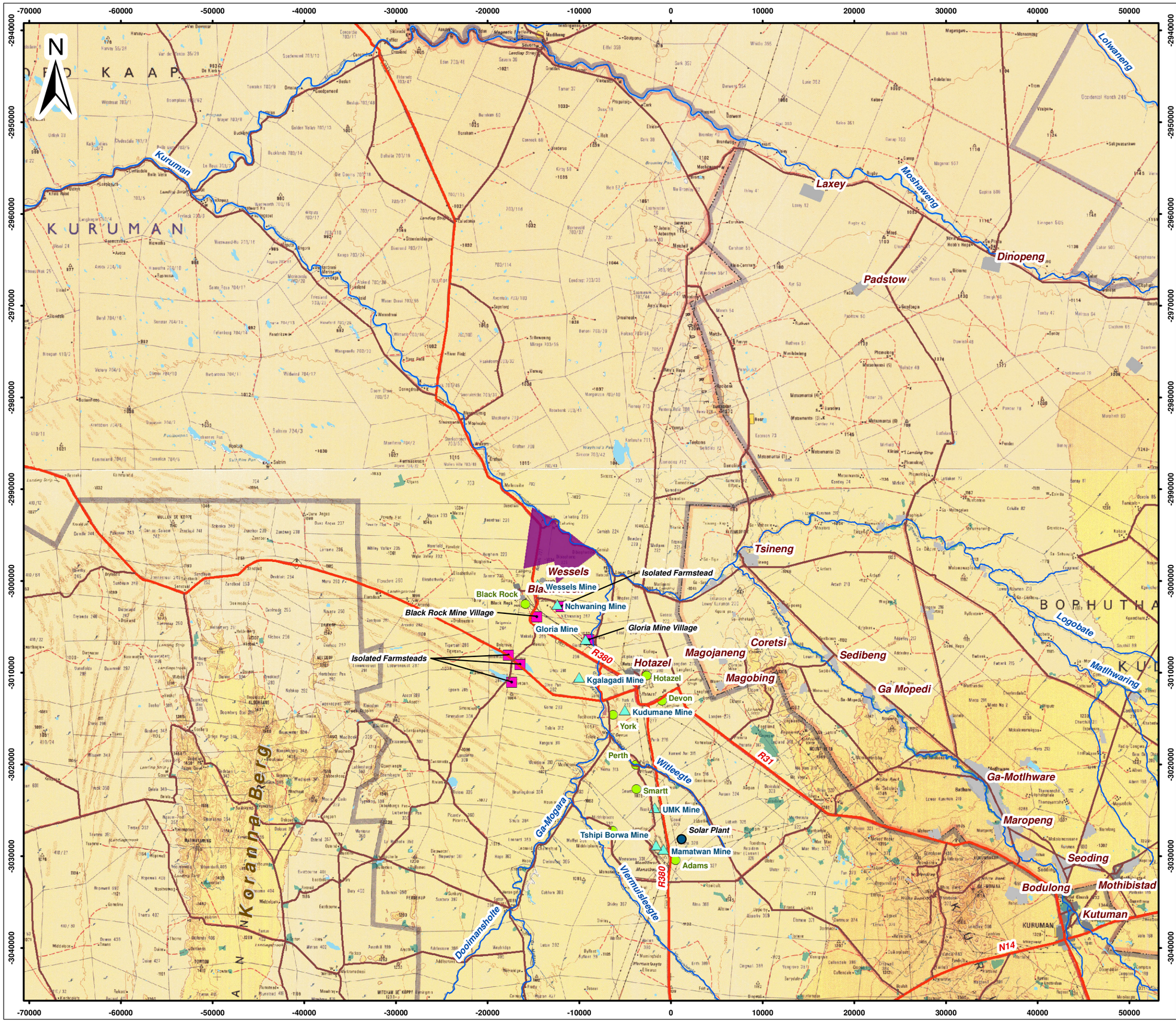

Legend

- Proposed Mining Right Area
- Main Roads
- Secondary Roads
- Power Line
- Rivers and Streams
- 20m Contour Lines
- Receptors
- Operating Manganese Mines
- Closed/Dormant Mines
- High Urban Density
- Low Urban Density
- Cultivated Land
- Wetlands

Khwara Manganese (Pty) Ltd

Figure 11

Regional Land Use

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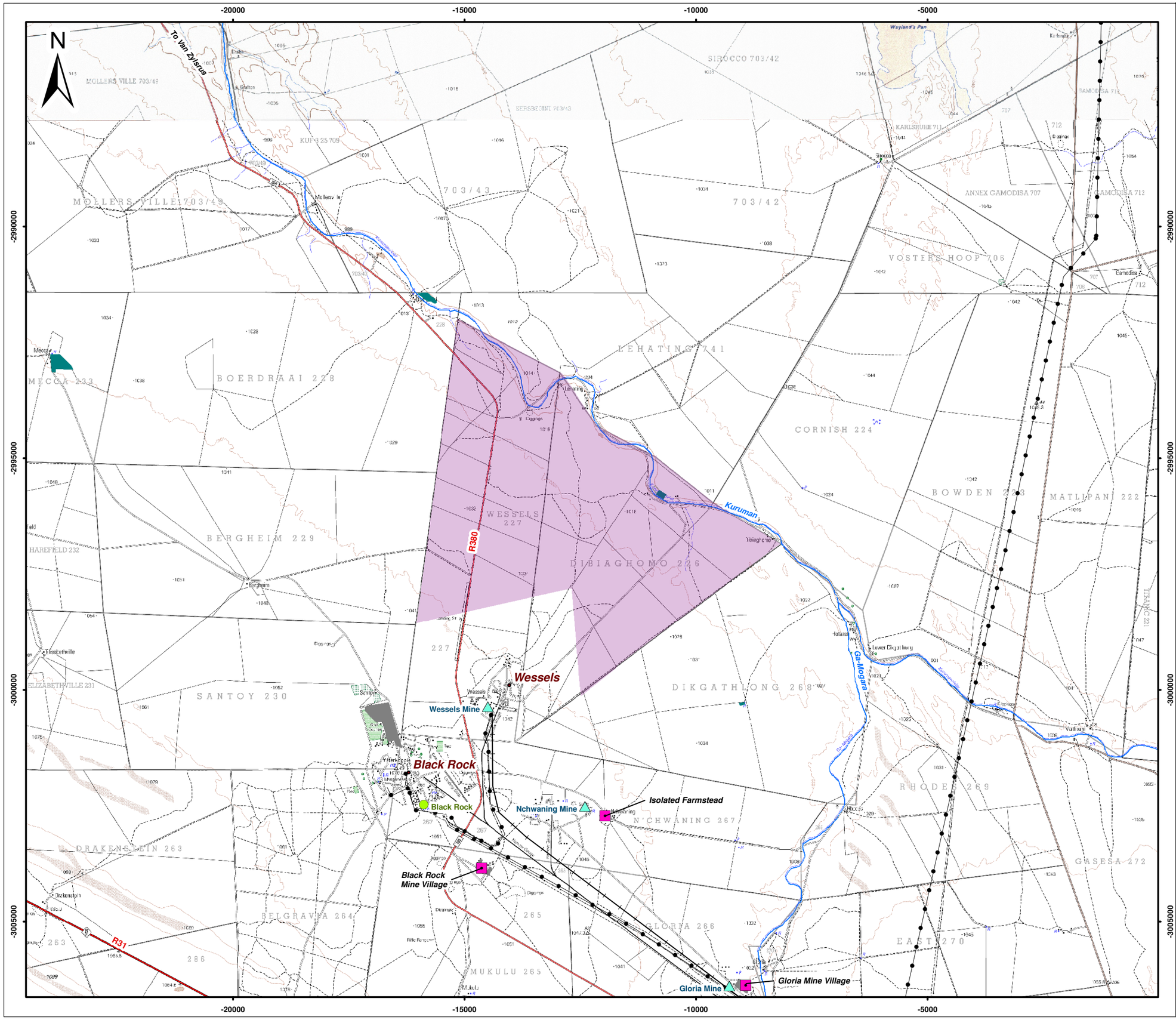
Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

720.12015.00004 | January 2017



Legend

- Proposed Mining Rights Area
- Closed/Dormant Mines
- Operating Manganese Mines
- Receptors
- High Urban Density
- Cultivated Land
- Rivers
- Powerline
- Railway
- Roads

0 2 4 Km

Scale: 1:80 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

Khwara Manganese (Pty) Ltd

Figure 12

Local Land Use Map

SLR Consulting (Africa) (Pty) Ltd
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Tel: +27 (11) 467-0945 Fax: +27 (11) 467-0978

720.12015.00004 | January 2017

6.5 IMPACTS IDENTIFIED

This section focusses on 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 3). 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 new 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. Further to this, an assessment of project alternatives is not applicable to this section as no project alternatives are being considered for the proposed project (Section 6.1).

TABLE 6-16: PRELIMINARY LIST OF POTENTIAL UNMITIGATED IMPACTS IDENTIFIED FOR THE PROPOSED PROJECT

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 report 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	Unmitigated					Degree to which impact can:		
				Consequence			Probability	Significance	be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
				Severity	Duration	Spatial scale					
Loss of mineral resources	Underground mining	N/A	Operation	H	H	H	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Biodiversity (Indirect loss and/or disturbance of terrestrial ecology through a lowering of groundwater levels)	Dewatering of underground workings	N/A	Operation Decommissioning Closure	H	H	M	H	H	Partially	Possible	Can be managed/mitigated to acceptable levels
Biodiversity (Alteration of sub-surface flow affecting aquatic ecosystems)	Dewatering of underground workings	N/A	Operation Decommissioning Closure	H	H	M	H	H	Partially	Possible	Can be managed/mitigated to acceptable levels
Groundwater (Lowering of groundwater levels and availability to third party users)	Dewatering of underground workings	N/A	Operation Decommissioning Closure	H	M	M	M	M	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of Palaeontological Resources	Underground mining	N/A	Operation	L	L	L	L	L	Partially	Possible	Can be managed/mitigated to acceptable levels
Positive socio-economic: Economic impact	Underground mining Dewatering of underground workings Use of Lehating's approved infrastructure and services within	N/A	Operation Decommissioning Closure	H +	M	H	H	H +	Not applicable	Not applicable	Can be managed/mitigated to acceptable levels

Potential impact	Activity	Alternative	Project phases	Unmitigated					Degree to which impact can:		
				Consequence			Probability	Significance	be reversed	cause irreplaceable loss of resources	be avoided/ Managed/ Mitigated
				Severity	Duration	Spatial scale					
	approved capacities										
Negative socio-economic: Inward migration and associated social ills	Underground mining Dewatering of underground workings Use of Lehating's approved infrastructure and services within approved capacities	N/A	Operation Decommissioning Closure	H	H	M	L	M	Partially	Not applicable	Can be managed/mitigated to acceptable levels
Change in land use (secondary impacts) related to surface and groundwater use	Dewatering of underground workings	N/A	Operation Decommissioning Closure	H	H	M	M	H	Fully	Possible	Can be managed/mitigated to acceptable levels

6.6 METHODOLOGY USED IN DETERMINING THE SIGNIFICANCE OF ENVIRONMENTAL IMPACTS

The proposed method for the assessment of environmental issues is set out in the table below. 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 17: CRITERIA FOR ASSESSING IMPACTS

Note: Part A provides the definition for determining impact consequence (combining severity, 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	Fairly widespread	Widespread

			Within site boundary Site	Beyond site boundary Local	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 PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) 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. It is important to note that given that no surface infrastructure will be established as part of the proposed project, numerous environmental attributes that would typically be influenced by mining projects will remain unchanged. It follows that the section below only focuses on potential impacts associated with the proposed project.

The potential impacts associated with the project phases (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**.

In accordance with the new DMR report template this section requires a discussion of the potential impacts taking into consideration all project related alternatives. With reference to Section 6.1, no project alternatives are being assessed for the proposed project. It follows that no reference to project alternatives will be made in the following section.

6.7.1 GEOLOGY

ISSUE: LOSS OF MINERAL RESOURCES

Project phase/s in which impact could occur

Operational	Decommissioning	Closure
	N/A	N/A

Discussion

By the nature of mining projects the geology is exploited for the target minerals therefore the impact on the geology is anticipated.

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 extend beyond the life of mine. The physical impact is linked to the spatial extent of the proposed project area. This is a localised spatial extent, however when one considers the economic nature of the impact, it will extend beyond the project area into the broader economy. The significance of the impact is high in the unmitigated scenario and could be reduced to low with mitigation.

The additional work required to address this issue is outlined in section 7.3.2.1 of this scoping report.

6.7.2 BIODIVERSITY

ISSUE: INDIRECT LOSS AND/OR DISTURBANCE OF TERRESTRIAL ECOLOGY THROUGH A LOWERING OF GROUNDWATER LEVELS

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

The proposed project has the potential to indirectly disturb vegetation, vertebrates and invertebrates during the operation, decommissioning and closure phases.

It is possible that species with deep root systems such as the *Vachellia haematoxylon* (Grey Camel Thorn), and *Vachellia karroo* (Camel Thorn) source water from groundwater aquifers. A mine related drop in groundwater levels can effectively place these trees in a situation where they are unable to reach water, particularly with larger trees as they are less adaptable to a change in groundwater levels than smaller trees. This may indirectly influence fauna and flora species dependant on these deep rooted trees for survival. Although very limited information is known regarding how deep rooted plants access water and at what depths, lowering of groundwater levels associated with the proposed project may indirectly result in a loss of trees and as such is assessed as a precautionary approach. Similarly, a change in the sub-surface flow (Section below) of the Kuruman River may indirectly influence faunal

aquatic communities' dependant of sub surface flow. This is a high severity in the unmitigated scenario and can be reduced to medium in the mitigated scenario with measures focussed on monitoring 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 life of mine. With mitigation the impacts should be limited to the life of the project or less. Biodiversity processes are not confined to the proposed project area and as such the spatial scale of impacts could extend beyond the site boundary in the unmitigated scenario. With mitigation the impact could be localised within the site boundary. In the unmitigated scenario, the significance of this potential impact is high as the probability is definite given the precautionary approach of the assessment. 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 7.3.1.1 of this scoping report.

ISSUE: ALTERATION OF SUB-SURFACE FLOW AFFECTING AQUATIC ECOSYSTEMS

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

Discussion

The Kuruman River is located along the north eastern boundary of the proposed project site. A section of this river is identified as a natural wetland system. The proposed project will require underground mining activities to take place beneath the Kuruman River. In the event that underlying aquifers contribute towards sub-surface flow, a lowering of groundwater levels from dewatering may alter the existing sub-surface flow of the Kuruman River. In the absence of quantitative data at this stage of the process, this impact has been assessed as a precautionary approach. In the event that this impact materialises affecting the aquatic environment, this is considered a high severity in the unmitigated scenario which would require mitigation to reduce to low. In the unmitigated scenario, the impact is long term because this impact is likely to exist beyond the life of mine. With mitigation the impacts should be limited to the life of the project once dewatering stops and groundwater levels rebound. In the mitigated and unmitigated scenarios the impact could extend beyond the site boundary as an alteration of sub-surface flow could extend downstream of the project site. The significance of the impact is high in the unmitigated scenario as the probability is definite. The significance in the unmitigated scenario is medium until closure when it is expected to reduce to low with a reduction in probability.

The additional work required to address this issue is described in Section 7.3.1.3 of this scoping report.

6.7.3 GROUNDWATER

ISSUE: REDUCING GROUNDWATER LEVELS AND AVAILABILITY TO THIRD PARTY USERS

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

Discussion

Groundwater levels could be reduced through dewatering. If dewatering within the proposed 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 proposed project. If the reduction of groundwater levels influences third party users the impact could extend beyond the site boundary depending on the extent of the dewatering cone and drawdown. Post mining, groundwater levels are expected to rebound. In the unmitigated scenario the significance of this impact is medium as the probability is possible and can be reduced to low with mitigation.

The additional work required to address this issue is described in Section 7.3.1.3 of this scoping report.

6.7.4 HERITAGE/CULTURAL AND PALEONTOLOGICAL RESOURCES

ISSUE: LOSS OF PALEONTOLOGICAL RESOURCES

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

There is a low possibility that the Hotazel Formation manganese ore body could contain stromatolites and this should be taken into account during the planning and development phases of the proposed project. The potential impact on palaeontological resources is therefore not assessed further however the mitigation measures cover the steps to be taken should there be any chance finds.

The additional work required to address this issue is described in Section 7.3.1.4 of this scoping report.

6.7.5 SOCIO-ECONOMIC ISSUES

ISSUE: ECONOMIC IMPACT (POSITIVE SOCIO-ECONOMIC)

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

Discussion

The proposed project will have positive socio-economic impacts in all phases. The proposed project will have a positive economic impact on the local, regional and national economies. Direct benefits will be derived from continued wages, taxes and profits associated with the Lehating Mine. Indirect benefits through the continued procurement of goods and services, and the continued increased spending power

of employees. The severity in both the unmitigated and mitigated scenario is a high positive. The positive economic impacts described above will be limited to the life of mine. After closure there may still be some positive impacts through maintenance and aftercare activities. In both the mitigated and unmitigated scenarios, the spatial scale of the impact is high because it will extend far beyond the proposed 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 Section 7.3.1.5 of this scoping report.

ISSUE: INWARD MIGRATION AND ASSOCIATED SOCIAL ILLS (NEGATIVE SOCIO-ECONOMIC)

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

Discussion

The proposed project may have negative socio-economic impacts in the operational, decommissioning and closure phases. The proposed project could contribute to the continuation of the following negative impacts associated with the Lehating Mine:

- 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 this impact by managing expectations with regard to employment through communication structures. In the normal course of events, 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 7.3.2.2 of this scoping report.

6.7.6 LAND USE

ISSUE: CHANGE IN LAND USE (SECONDARY IMPACTS) RELATED TO SURFACE AND GROUNDWATER USE

Project phase/s in which impact could occur

Operational	Decommissioning	Closure

Discussion

The proposed project may have a secondary impact on land uses within and surrounding the proposed project area in the operational, decommissioning and closure phases.

Khwara currently undertakes prospecting related activities on portion 2 of the farm Wessels 226 and portion 3 and 4 and the remaining extent of the farm Dibiaghomo 227. These farms are currently zoned as agriculture in terms of the Joe Morolong Local Municipality. It follows that although no on-site third party land use will be physically impacted, the current zoning requires amendment. Other land uses within the proposed project area include: agriculture (Ad-hoc livestock grazing) and infrastructure (road network and a regional powerline). Land uses surrounding the proposed project area include: residential, mining and agriculture (Ad-hoc livestock grazing and game).

Given that the proposed project will not require the establishment of any surface infrastructure, it is unlikely that the proposed project will directly influence existing infrastructure, residential areas or mining activities surrounding the proposed project area. It is however important to note that the indirect loss and/or disturbance of terrestrial ecology (as discussed in Section 6.7.2) may influence ad-hoc grazing activities within and surrounding the proposed project area.

In the unmitigated scenario, and taking a precautionary approach, the severity is high and can be reduced to medium/low with mitigation that is focussed on prevention and/or controls. 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 is linked to the dewatering cone of depression which could extend beyond the proposed project area in both the unmitigated and mitigated scenarios. The unmitigated significance is high where environmental impacts are uncontrolled; the probability that land uses will be indirectly impacted by mining is possible. With mitigation the significance reduces to medium prior to closure and to low post closure.

No specific additional work will be undertaken for the secondary impact on land use, rather findings outlined in the groundwater assessment (Section 7.3.1.3) and biodiversity assessment (Section 7.3.1.1) will support the assessment of this impact.

6.8 THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF 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 phase with specialist input as appropriate.

TABLE 18: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK

Activity Whether listed or not listed	Potential impact	Possible mitigation	Potential for residual risk
Underground mining	Loss of a mineral resources	• Mine design to maximise mineable resource	Low
	Loss of palaeontological resources	• Contact SAHRA in the event of a chance find	Low
	Positive socio-economic: Economic impact Negative socio-economic: Inward migration and associated social ills	• Continuation of plans and policies associated with socio-economic aspects	Medium
Dewatering of underground workings	Biodiversity (Indirect loss and/or disturbance of terrestrial ecology through a lowering of groundwater levels)	• Biodiversity monitoring specific to vegetation and an aquatic environment (if required)	Medium
	Biodiversity (Alteration of sub-surface flow affecting aquatic ecosystems)		Medium to low
	Groundwater (Lowering of groundwater levels and availability to third party users)	• Groundwater monitoring and compensation for loss if there is third party reliance on groundwater resources and loss as a result of dewatering • Prior to dewatering related activities the necessary approvals need to be obtained from the DWS in terms of Section 21 water uses of the NWA. • Prior to mining underneath the Kuruman River, the relevant exemption in terms of GN R704 needs to be obtained from the DWS.	Medium
	Positive socio-economic: Economic impact Negative socio-economic: Inward migration and associated social ills	• Continuation of plans and policies associated with socio-economic aspects	Medium
	Change in land use (secondary impacts) related to surface and groundwater use	• Submission of a re-zoning application to the Joe Morolong Local Municipality in terms of the Northern Cape Planning and Development Act, 1998 (Act No 7 of 1998) or the Spatial Planning and Land Use Management Act No. 16 of 2013, whichever is applicable at the time of submitting the re-zoning application. • Notify Telkom of project commencement and completion of the project. Even though no surface infrastructure will be established as part of the proposed project, in the unlikely event that any Telkom infrastructure is damaged, Telkom will be notified immediately and any damage costs will be handled by Khwara.	Medium to Low

Activity Whether listed or not listed	Potential impact	Possible mitigation	Potential for residual risk
		• Implementation of the biodiversity vegetation monitoring programme.	
Use of Lehating's approved infrastructure and services within approved capacities	No additional impacts as no additional facilities or capacities needed.	Not applicable as these mitigation measures are already approved in the Lehating EIA and EMP.	Not applicable

6.9 THE OUTCOME OF THE SITE SELECTION MATRIX

With reference to Section 6.1 no project alternatives were considered for the proposed project and as such this section is not applicable.

6.10 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Given that no surface infrastructure will be established as part of the proposed project, no layout alternatives are being considered. No mining method alternatives are being considered due to the depth of the ore body. In addition to this, no service/technology alternatives are being considered as approved facilities at the Lehating mine will be utilised.

6.11 STATEMENT MOTIVATING THE PREFERRED SITE

Refer to Section 6.9.

7 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

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

As outlined in Section 6.1, no alternatives are being considered for the proposed project. During the EIA and EMP report phase, a comparison between the options of proceeding with the proposed project with that of not proceeding with the proposed project will be considered.

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

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 report phase. The potential impacts are presented for each of the project phases in tabular format (Table 19).

TABLE 19: LIST OF POTENTIAL IMPACTS AS THEY RELATE TO PROJECT ACTIONS / ACTIVITIES / PROCESSES

Main activity/process	Phase	Impacts (unmitigated)
Underground mining	Operation	Loss and sterilisation of mineral resources Loss of palaeontological resources Positive socio-economic: Economic impact Negative socio-economic: Inward migration and associated social ills
Dewatering of underground workings	Operation Decommissioning Closure	Biodiversity (Indirect loss and/or disturbance of terrestrial ecology through a lowering of groundwater levels) Biodiversity (Alteration of sub-surface flow affecting aquatic ecosystems) Groundwater (Lowering of groundwater levels and availability to third party users) Positive socio-economic: Economic impact Negative socio-economic: Inward migration and associated social ills Change in land use (secondary impact)
Use of Lehating's approved infrastructure and services within approved capacities	Operation Decommissioning Closure	No additional impacts as no additional facilities or capacities needed.

7.3 DESCRIPTION OF ASPECTS TO BE ASSESSED BY SPECIALISTS

This section describes the nature and extent of further investigations required in the Environmental Impact Assessment, including any specialist reports that may be required, and sets out the proposed approach to the EIA and EMP report phase.

7.3.1 FURTHER SPECIALIST INVESTIGATIONS

The proposed terms of reference for further investigations required for the completion of the EIA study are discussed below. It is important to note that were relevant, further investigations will only be undertaken for environmental attributes likely to be impacted by the proposed project. The results of these studies will be collated into a combined EIA and EMP report.

7.3.1.1 BIODIVERSITY (FLORA, FLORA AND AQUATICS)

It is proposed that the biodiversity assessment will be conducted by Scientific Aquatic Services CC (SAS). The assessment has the following objectives:

- Desktop review to determine the conservational status of the proposed project area in relation to existing national and provincial databases.
- Identify potential impacts on flora, fauna and the aquatic environment. This includes an aquifer dependant ecosystem investigation.
- To have input, together with SLR, into project management measures and monitoring programmes going forward.

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

7.3.1.2 WATER BALANCE

It is proposed that a conceptual wet and dry season water balance will be compiled by SLR for the proposed project. The exercise will have the following objectives:

- To update the wet and dry season water balance compiled for the Lehating Mine to include dewatering volumes associated with the proposed project.
- To have input, together with the SLR EIA team into water management measures going forward.

The updated water balance will form part of the EIA and EMP report.

7.3.1.3 GROUNDWATER

It is proposed that a specialist groundwater investigation will be conducted by SLR. The study will have the following objectives:

- A hydrocensus of a 5km radius to determine the baseline condition of groundwater quality and quantity of the proposed project area
- Develop a conceptual groundwater model for the proposed site
- Model the dewatering impacts of the proposed project taking into consideration dewatering activities and volumes associated with the Lehating Mine
- Assess the significance of dewatering impacts
- To have input, together with the SLR EIA team and 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 groundwater assessment report will be provided in the EIA and EMP report.

7.3.1.4 PALAEONTOLOGICAL RESOURCES

A palaeontological specialist assessment was undertaken on the farms Wessels 226 and Dibiaghomo 227 in May 2013 (PGS, May 2013) and April 2013 (Gideon Groenewald, April 2013) as part of prospecting related activities. The study included the following objectives:

- Identify and map (through literature review) all paleontological resources in the proposed project area
- Assess the significance of the identified resources
- Assess the impact of the proposed project on the paleontological resources
- Provide input, together with SLR into management measures going forward.

As part of the proposed project, this study will be updated to be project specific in order to meet the SAHRA standards, May 2007 requirements. A copy of this report will be included in the EIA and EMP report.

7.3.1.5 ECONOMIC AND SUSTAINABILITY ANALYSIS

It is proposed that an economic and sustainability land use analysis will be undertaken by Mercury Financial Consultants (Pty) Ltd. This study has the following objectives:

- A preliminary analysis to identify economic conditions in order to profile baseline conditions
- Quantify the impact on the socio-economic conditions of directly affected persons by determining the potential impact, in financial terms, of the loss in property value or infrastructure assets and determining the economic loss, in terms of net present value or as a result of the proposed mining activity
- Comparative assessment of the identified land use and development alternatives and their potential environment, social and cultural impacts in view of generally accepted sustainable development principles which considers the costs and benefits of social, environmental and economic factors
- Provide input, together with SLR into management measures going forward.

A copy of the economic specialist report will be provided in the EIA and EMP report.

7.3.1.6 FINANCIAL PROVISION

It is proposed that a financial provision assessment be undertaken by SLR in accordance with the NEMA Regulations (1147 of 2015) pertaining to the financial provision for mining operations. The NEMA Regulations (1147 of 2015) requires a detailed itemisation of all activities and costs calculated based on actual costs of implementation of measures required for:

- Annual rehabilitation, as reflected in an annual rehabilitation plan
- Final rehabilitation, decommissioning and closure of the mining operations at the end of the life of operations, as reflected in a final rehabilitation, decommissioning and mine closure plan

- Remediation of latent or residual environmental impacts which may become known in the future, as reflected in an environmental risk assessment report.

A copy of the financial provision will be included in the EIA and EMP report.

7.3.2 FURTHER QUALITATIVE INVESTIGATIONS

7.3.2.1 GEOLOGY

It is proposed that no further specialist investigations are required. The impacts will be assessed qualitatively and detailed management measures will be provided in the EIA and EMP report by SLR.

7.3.2.2 SOCIO-ECONOMIC ISSUES

It is proposed that no further specialist investigations are required. The impacts will be assessed qualitatively and detailed management measures will be provided in the EIA and EMP report by SLR.

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

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

Proposed consultation meetings for the EIA phase include:

- A site visit and meeting with DENC, DWS, DMR, DAFF and DRDLR (if requested)
- A general authorities meeting at the end of the EIA phase to present the main findings of the EIA prior to submission of the EIA and EMP report for during the review of the EIA and EMP report if requested.

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

7.7.1 STEPS TO BE TAKEN TO NOTIFY INTERESTED AND AFFECTED PARTIES

IAPs 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, post and bulk SMS and hand deliveries (if required). IAPs will similarly be invited to attend a public feedback meeting during the EIA phase (if requested).

7.7.2 DETAILS OF THE ENGAGEMENT PROCESS TO BE FOLLOWED

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

- Circulation of the EIA and EMP report for public review. This report will include any issues and concerns raised by IAPs and commenting authorities including responses from the project team
- Public and/or stakeholder meeting/s to give feedback on the findings of the EIA (if requested)
- Notification of IAPs on the database on the DMR decision.

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 report which will be made available for public review:

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

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

The description of the tasks that will be undertaken during the EIA phase is provided below in Table 20 below.

TABLE 20: EIA AND EMP ACTIVITIES AND TIMING

Objectives	Corresponding activities and estimated dates
Further investigations (January 2017 to June 2017)	
• Describe the affected environment • Define potential impacts • Give management and monitoring recommendations	• Investigations by technical project team, specialists (where relevant) and SLR of issues identified during the scoping stage.

Objectives	Corresponding activities and estimated dates
EIA and EMP report phase (January 2017 to November 2017)	
• Assessment of potential environmental impacts • Design requirements and management and mitigation measures • Receive feedback on application	• Compilation of the EIA and EMP report (June 2017) • Distribute the EIA and EMP report to IAPs, DMR and other commenting authorities for review (August 2017). • Public feedback meetings with IAPs (if requested) (August 2017). • Record comments (September 2017). • Submit final report to DMR for decision making (September 2017) • Circulate record of decision to all registered IAPs (January 2018).

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

Refer to Table 18 for a list of measures to reverse, mitigate or manage identified impacts including the residual risks that need to be managed and monitored. It should be noted that this table has been compiled with the preliminary available information and will be refined during the EIA 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 and will be investigated further during the EIA Phase as outlined in Section 7.

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

No impact is expected. This will however be confirmed during the EIA and EMP report phase of the proposed project.

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, Natasha Smyth, 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: 15/05/2017

15/05/2017

BRANDON IAN STOBART
EX OFFICIO
COMMISSIONER OF OATHS
NON-PRACTISING ATTORNEY
REPUBLIC OF SOUTH AFRICA
UNIT 7, FOURWAYS MANOR OFFICE PARK
FOURWAYS

10 UNDERTAKING REGARDING LEVEL OF AGREEMENT

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

Signature of the EAP

Date: 15/05/2017

BRANDON IAN STOBART
EX OFFICIO
COMMISSIONER OF OATHS
NON-PRACTISING ATTORNEY
REPUBLIC OF SOUTH AFRICA
UNIT 7, FOURWAYS MANOR OFFICE PARK
FOURWAYS
15/05/2017

11 REFERENCES

Joe Morolong Spatial Development Framework, September 2012.

PGS, Heritage Impact Assessment Prospecting on Remaining extent of the farm Wessels 227 and Portions 1 and 2 and the remaining extent of the farm Dibiaghomo 226, near Black Rock in the Northern Cape Province, May 2013

Scientific Aquatic Services CC, Desktop Ecological Assessment and Site Sensitivity Report as Part of the Environmental Assessment and Authorisation Process for Mining Activities on the Farms Wessels 227 and Dibiaghomo 228, North of Black Rock, Northern Cape Province.

Social and Labour Plan for the Proposed Tshipi é Ntle Manganese Mining (Pty) Ltd, January 2017.

SLR Consulting (Africa) (Pty) Ltd, Environmental Impact Assessment and Environmental Management Programme Report for the Proposed Lehating Mine, September 2013.

South African Heritage Resources Agency, APM Guidelines: Minimum Standards for the Archaeological and Palaeontological Components of Impact Assessment Reports, May 2007.

APPENDIX A: PROOF OF EAP REGISTRATION

APPENDIX B: CURRICULUM VITAE

APPENDIX C: LOCAL AND REGIONAL SETTING

APPENDIX D: SITE PLAN (NOT APPLICABLE)

APPENDIX E: INFORMATION SHARING WITH IAPS AND COMMENTING AUTHORITIES

- NEMA application form
- Proof of submission of the notice of intent to submit a water use license application to the DWS
- Database
- Background information document in English and Afrikaans and proof of distribution
- Site notices in English and photos of the site notices
- Advertisements placed in the Kalahari Bulletin and Kathu Gazette
- Formal invitations sent to IAPs to notify them of the project, EIA process and public meeting
- Formal invitations sent to commenting authorities to notify them of the project, EIA process and commenting authorities meeting
- Minutes of the public meeting held on 27 January 2017 including the attendance register
- Minutes of the commenting authorities meeting held on 27 January 2017 including the attendance register
- Correspondence from the Land Claims Commissioner
- Comments received from commenting authorities and IAPs

RECORD OF REPORT DISTRIBUTION

Project Number:	720.01015.00004
Title:	Scoping report for the development of the proposed underground Khwara Manganese Mine
Report Number:	1
Proponent:	Khwara Manganese (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Raisebe Sekepane	Department of Mineral Resources	1	May 2017	N Smyth
Jeff Leader	Khwara Manganese (Pty) Ltd	2	May 2017	N Smyth
Jacoline Mans	Department of Agriculture, Forestry and Fisheries	Electronic	May 2017	N Smyth
Joe Masela	Ward Committee Secretary	Electronic	May 2017	N Smyth
Julie Katong	Ward Councillor – Ward 4	Electronic	May 2017	N Smyth
Carol Kenyon	SLR Consulting (South Africa) (Pty) Ltd	3	May 2017	N Smyth
Moses Ramakulukusha	Department of Environment and Nature Conservation	Electronic	May 2017	N Smyth
Esther Makungo	Department of Water and Sanitation	Electronic	May 2017	N Smyth
Philip Hine	South African Heritage Resource Agency	Electronic	May 2017	N Smyth
Viljoen Mothibi	Department of Agriculture and Land Affairs	Electronic	May 2017	N Smyth
Ryan Oliver	The Northern Cape Department of Rural Development and Land Reform	Electronic	May 2017	N Smyth
Jaco Roelofse	Department of Public Works, Roads and Transport	Electronic	May 2017	N Smyth
Klaas Teise	John Taolo Gaetsene District Municipality	4	May 2017	N Smyth
Seneo Seleka	Joe Morolong Local Municipality	5	May 2017	N Smyth
Librarian	Kathu Library	6	May 2017	N Smyth
Librarian	Hotazel Library	7	May 2017	N Smyth
Librarian	Black Rock Library	8	May 2017	N Smyth
Librarian	Kuruman Library	9	May 2017	N Smyth
Librarian	Kathu Library	10	May 2017	N Smyth