SCOPING REPORT FOR THE DEVELOPMENT OF THE PROPOSED MOKALA MANGANESE MINE

JULY 2015

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)

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SCOPING REPORT FOR THE DEVELOPMENT OF THE PROPOSED MOKALA MANGANESE MINE

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ACRONYMS AND ABBREVIATIONS

Acronyms / Abbreviations	Definition
ADE	Aquifer Dependent Ecosystems
BID	Background information document
CBA	Critical Biodiversity Area
DALA	Department of Agriculture and Land Affairs
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
EIA	Environmental impact assessment
EMP	Environmental management programme
IAPs	Interested and/or affected parties
IUCN	International Union for Conservation of Nature
JMLM	Joe Morolong Local Municipality
JTGDM	John Taolo Gaetsewe District Municipality
mcm	million cubic meters
MPRDA	Mineral and Petroleum Resources Development Act No. 28 of 2002
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
NWA	National Water Act No. 36 of 1998
ROM	Run-of-mine
SAHRA	South African Heritage Resources Agency
SANBI	South African National Botanical Institute
SANS	South African National Standards
SLR	SLR Consulting (South Africa) (Pty) Ltd
Mokala	Mokala Manganese (Pty) Ltd

INTRODUCTION

INTRODUCTION TO THE PROPOSED PROJECT

Mokala Manganese (Pty) Ltd (Mokala) is a South African company of which Ntsimbintle Mining (Pty) Ltd owns 51%, with the remaining 49% owned by Blue Flacon 222 Trading (Pty) Ltd.

Mokala is proposing to establish a new opencast manganese mine on the remaining extent of the farm Gloria 266, located 4 km north-west of the town Hotazel in the Joe Morolong Local Municipality, Northern Cape Province. Refer to Figure 1 and Figure 2 for the regional and local settings respectively.

In broad terms the proposed Mokala Manganese project will comprise open cast activities, a dry crushing and screening plant, overburden rock dumps, product and run-of mine stockpiles, topsoil stockpiles, mine related facilities such as workshops, stores and various support infrastructure and services. Further to this, the proposed project will require:

- The realignment of the R380 road on the farm Kipling 271 and across the remaining extent of the farm of Gloria 266 as this road currently bisects the proposed mining project site
- Upgrading of the intersection to the proposed mine on portion 1 of the farm Gloria 266 and also serving the existing Gloria Mine
- The realignment of a section of the Ga-Mogara drainage channel within the existing river channel. This realignment will extend onto the farm Umtu 281.

The EIA process comprises two phases: a scoping phase and an environmental impact assessment phase combined 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 Mokala 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 several listed environmental activities. An application was submitted by Mokala to the DMR on 03 July 2015. The applicable list of activities is provided in Section 4.1. 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 Mokala to the DMR on 03 July 2015. A single scoping

report and EIA and EMP report supporting the new mining right application and associated infrastructure will be submitted to the DMR for decision making.

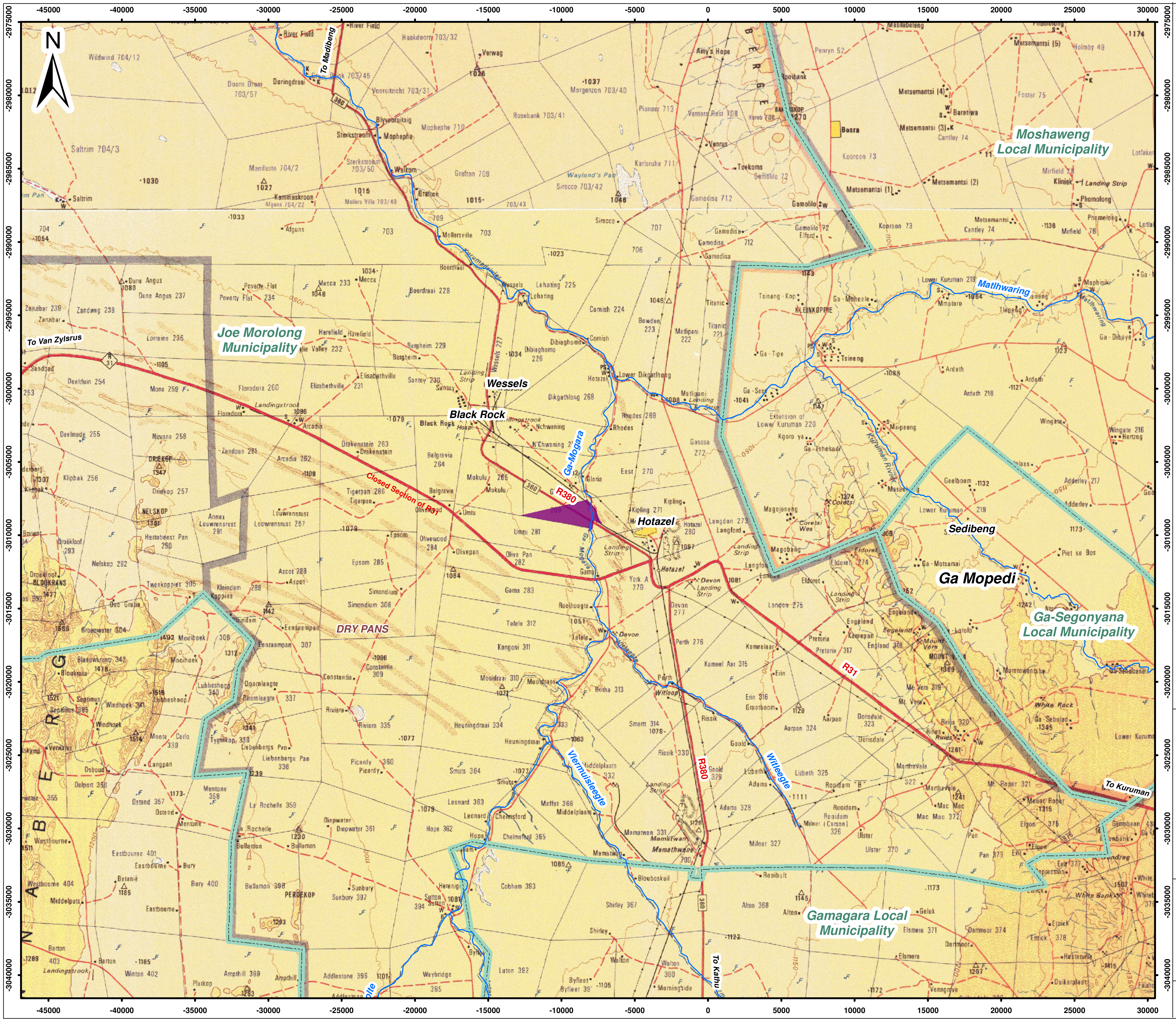
- A water use license from the Department of Water and Sanitation (DWS) in terms of the National Water Act No. 36 of 1998 (NWA). The applicable water uses in terms of Section 21 of the NWA include (a), (b), (c), (g), (i) and (j).
- A waste management license from the DMR in terms of the National Environmental Management: Waste Act No. 59 of 2008 (NEM:WA). The applicable list of activities as currently set out in the legislation (and which is possibly subject to change) is provided in Section 4.1.

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 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 Project Area
- Local Municipalities
- Rivers
- Roads

0 4 8 Kilometers

Scale: 1:250 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeesthoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Figure 1

Regional Map

SLR

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April 2015

-10000

N

Gonveyor Belt

Ga-Mogara

Diggings
To Van Zylsrus

Gloria 266

Existing Intersection
to Gloria Mine

1040

22 54' 58.93"E
27 10' 48.65"S

Diggings
271

Kipling 271

266

1012

Diggings

1041

271

Conceptual
River
Re-Alignment

22 55' 34.93"E
27 11' 39.73"S

Topsoil Berm

Narrow Gauge

R380

22 55' 11.32"E
27 11' 48.79"S

22 55' 6.67"E
27 11' 48.3"S

22 55' 4.68"E
27 11' 55.71"S

1

1046

Umtu 281

Umntu

1051

Hotazel 280

-3010000

-10000

Legend

- Proposed Infrastructure
- Proposed Road Re-Alignment of R380
- Proposed Open Pit Area
- Farm Boundaries
- Powerlines
- Railway
- Rivers
- Tracks/Paths
- Historical Borrow Pits
- Roads

0 400 800 Meters

Scale: 1:18 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Figure 2

Local Setting

SLR Consulting (Africa) (Pty) Ltd
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710.0912.00001

April 2015

1 CONTACT PERSON AND CORRESPONDENCE ADDRESS

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 Daly	Brandon Stobart
Tel No.:	011 467 0945	011 467 0945
Fax No.:	011 467 0978	011 467 0978
E-mail address	ndaly@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 Daly has approximately 6 years of relevant experience (Curriculum Vitae attached in Appendix B). Brandon Stobart has over 17 years of relevant experience (Curriculum Vitae attached in Appendix B) and is registered as an environmental assessment practitioner with the interim certification board. The proof of this registration is attached in Appendix A. Both Natasha Daly and Brandon Stobart have been involved in several impact assessments for large scale mining development in Southern Africa.

2 DESCRIPTION OF THE PROPERTY

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	• Remaining extent and portion 1 of the farm Gloria 266 • The farm Kipling 271 • The farm Umtu 281
Application area (Ha)	Approximately 148ha will be disturbed as part of the proposed project.
Magisterial district	Located within the Kuruman Magisterial District and in the John Taolo Gaetsene District Municipality
Local municipality	Joe Morolong Local Municipality
Distance and direction from nearest town	Located approximately 4 km north-west of the town Hotazel
21 digit Surveyor General Code for each farm portion	Remaining extent of the farm Gloria 266: CO4100000000026600000 Portion 1 of the farm Gloria 266: CO4100000000026600001 The farm Umtu 281: CO4100000000028100000 The farm Kipling 271: CO4100000000027100000
Co-ordinates (Also illustrated on Figure 2)	Western point: 22° 52’ 24.53’’ E and 27° 11’ 21.34’’ S Northern point: 22° 54’ 58.93’’ E and 27° 10’ 48.65’’ S Eastern point: 22° 55’ 34.93’’ E and 27° 11’ 39.73’’ S Southern point: 22° 55’ 11.32’’ E and 27° 11’ 48.79’’ S Southern point (River realignment): 22° 55’ 6.67’’ E and 27° 11’ 48.3’’ S and 22° 55’ 4.68’’ E and 27° 11’ 55.71’’ S

3 LOCALITY MAP

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.

4 DESCRIPTION OF THE SCOPE OF THE PROPOSED PROJECT

4.1 LISTED AND SPECIFIED ACTIVITIES

The activities and infrastructure associated with the proposed project are listed in Table 3 below and are illustrated in Figure 4 (where relevant). In each case the relevant NEMA and/or possible NEM:WA listed activities which will be triggered by the proposed project for the various activities and infrastructure has been provided in Table 3. A description of each of the listed activities identified is provided in Table 4.

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

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
Site preparation		
Selective clearing of vegetation in areas designated for surface infrastructure	Approximately 148 ha	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Earthworks		
Stripping and stockpiling topsoil and sub-soil and the establishment of a topsoil stockpile area and berm	• Topsoil stockpile (Approximately 5 ha) • Topsoil berm located along the R380 realignment route (Approximately 8.3 ha) • Topsoil berm located on the southern edge of the open pit (Approximately 1.7 ha)	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Cleaning, grubbing and bulldozing activities	This forms part of the overall 148 ha of disturbance.	As above
Digging trenches and foundations.		
Establishing storm water controls (channels, berms) as per storm water management plan		
Bulk earthworks including shaping and lining of pond walls and building safety berms		
Civil works		
General building activities and erection of structures	This forms part of the overall 148 ha of disturbance.	As above
Foundation excavations and compaction		
Mixing of concrete and concrete work		
Steel work (including grinding, welding and erection)		
Open pit mining		
Open cast mining	Approximately 86 ha	GNR. 983 (Activity 12) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Backfilling the open pit with overburden rock		GNR. 984 (Activity 6) GNR. 984 (Activity 17)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
		GNR. 984 (Activity 15)
Blasting and drilling	Within the open pit as discussed above	GNR. 983 (Activity 12) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Processing plant		
Plant area: • Primary crusher • Secondary crusher and • Screening plant	Plant area: • Primary crusher (approximately 0.41 ha) • Secondary crusher (approximately 0.10 ha) • Screening plant (approximately 0.04 ha)	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 21) GNR. 985 (Activity 12)
Truck loading facility	Approximately 0.5 ha	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 985 (Activity 12) GNR. 984 (Activity 17)
Transportation		
Internal haul roads, turning circle and upgrading the intersection to Gloria Mine	Internal haul roads (approximately 4.6 ha), turning circle (approximately 0.18 ha) and upgrading intersection at Gloria Mine (approximately 0.96 ha)	GNR. 983 (Activity 24) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Widening of existing gravel roads	Approximately 2 ha	GNR. 983 (Activity 28) GNR. 983 (Activity 56) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Realignment of the R380	Approximately 3.7 ha	GNR. 983 (Activity 24) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 984 (Activity 27)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
		GNR. 985 (Activity 12)
Loading, hauling and transportation of ROM, product and materials	Within transport and material handling infrastructure discussed above	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Conveyors and weighbridge	Conveyors (approximately 0.06 ha) and weighbridge (approximately 0.101 ha)	GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Mineralised waste		
Temporary overburden rock stockpiles and berms	• Temporary Overburden rock stockpiles (Approximately 16 ha) • Overburden rock berm located along the river realignment (Approximately 2.3 ha) • Backfilled open pit	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 6) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12) GNR. 921 (Category B 4(7)) GNR. 921 (Category B 4(8)) GNR. 921 Category B 4(10)
Product stockpiles: • Fine stockpiles • Supplementary fines stockpile • Product stockpile • Supplementary product stockpile	• Fines stockpiles (approximately 1 ha) • Supplementary fines stockpile (approximately 1ha) • Product stockpile (approximately 1 ha) • Supplementary product stockpile (approximately 1 ha)	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 6) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
ROM stockpile: Low grade and high grade	Low grade (approximately 1.03 ha) and high grade stockpile (approximately 1 ha).	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 6) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
Sewage treatment plant	Approximately 0.02 ha.	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Non-mineralised waste (General and hazardous waste)		
Temporary disposal of general waste (building rubble, domestic waste, cleared vegetation, construction material (electrical/wood/steel) off cuts, wood chips and fencing at waste yard	Waste yard (approximately 0.01 ha)	Not applicable
Temporary disposal of hazardous waste (light bulbs, lubricants, paint and explosive packaging and empty cement bags at waste yard		
Disposal and/or treatment of contaminated soils		
Removal of waste by contractor for recycling, re-use and/or final disposal at permitted waste disposal facilities	Not applicable	
Water supply, use and management		
Establishment of water supply boreholes	Approximately 0.01 ha	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Realignment of the Ga-Mogara drainage channel	Approximately 2.47 ha	GNR. 983 (Activity 12) GNR. 983 (Activity 19) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Establishment of a water treatment plant	Approximately 0.04 ha	GNR. 983 (Activity 10) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
Establishment of stormwater controls: • Main tower tank • Recycle water pond 1 • Recycle water pond 2 • Recycle water pond 3 • Recycle water pond 4 • Fire water tank • Elevated potable and process water tanks	• Main tower tank (approximately 0.01 ha) • Recycle water pond 1 (approximately 0.41 ha) • Recycle water pond 2 (approximately 0.63 ha) • Recycle water pond 3 (approximately 0.14 ha) • Recycle water pond 4 (approximately 0.16 ha) • Fire water tank (approximately 0.02 ha) • Elevated potable and process water tanks (approximately 0.07 ha)	GNR. 983 (Activity 10) GNR. 983 (Activity 13) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 6) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Power supply and use		
Use of generators	Approximately 0.01 ha	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Mini sub-station	Approximately 0.01 ha	GNR. 983 (Activity 11) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Realignment of a Telkom line that runs parallel to the R380	Approximately 3.7 ha	GNR. 983 (Activity 12) GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)
Support services		
Supporting infrastructure: • Administrative block: Offices, kitchen, canteen, training centre, mustering centre and clinic/emergency room • Flammable store • Change house • Stores	Supporting infrastructure: • Administrative block: Offices, kitchen, canteen, training centre, mustering centre and clinic/emergency room (approximately 0.12 ha) • Flammable store (approximately 0.03 ha ha) • Change house (approximately 0.01 ha)	GNR. 983 (Activity 27) GNR. 983 (Activity 28) GNR. 984 (Activity 15) GNR. 984 (Activity 17) GNR. 985 (Activity 12)

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
• Workshop and washbays • Truck staging areas and truck staging toilet facility • Control room • Security gate and office	• Stores (approximately 0.07 ha) • Workshop and washbays (approximately 0.16 ha) • Truck staging areas and truck staging toilet facility (approximately 1.00 ha) • Control room (approximately 0.004 ha) • Security gate and office (approximately 0.15 ha)	
Establishment of fuel storage facility and refuelling bays	Approximately 0.10 ha.	GNR. 983 (Activity 14) GNR. 983 (Activity 28) GNR. 983 (Activity 27) GNR. 984 (Activity 15) GNR. 985 (Activity 12) GNR. 984 (Activity 17)
General site management		
Appointment of contractors	Not applicable	Not applicable
Site management (monitoring, inspections, maintenance, security, access control)		
Environmental awareness training and emergency response		
On-going rehabilitation of facilities/disturbed areas		
Implementing and maintaining management plans		
Demolition		
Dismantling and demolition of infrastructure and equipment.	Within the project footprint described above	Not applicable
Utilisation of site supporting services (access control and security, portable toilets at digging sites and open cast pits, diesel bowsers (re-fuelling equipment))		
Rehabilitation		
Backfill and profiling of all pits and voids with provision for preventing surface subsidence	Approximately 86 ha	GNR. 921 (Category B 4(7)) GNR. 921 (Category B 4(8))
Replacing soil resources	Approximately 141 (Road realignment and river realignment are permanent)	Not applicable
Slope stabilisation and erosion control		
Landscaping		
Re-vegetation of disturbed areas and where infrastructure was removed		
Removal of alien invasive species from rehabilitated sites		
Restoration of natural drainage patterns as far as practically possible		

DESCRIPTION OF ACTIVITY	AERIAL EXTENT OF THE ACTIVITY (HA)	LISTED ACTIVITY NUMBER AND APPLICABLE LISTING NOTICE
(excludes the realignment of the Ga-Mogara drainage channel)		
Rehabilitation of access roads	Approximately 6.6 ha	
Maintenance and aftercare		
Initiation of aftercare and maintenance program	Approximately 148 ha	Not applicable
Maintenance of rehabilitated areas		

TABLE 4: DESCRIPTION OF THE LISTED ACTIVITIES APPLIED FOR AS PART OF THE PROPOSED PROJECT

ACTIVITY NUMBER	LISTED ACTIVITY
NEMA LISTING NOTICE 1 GNR.983	
10	The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.
11	The development of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
12	The development of- (i) canals exceeding 100 square metres in size (ii) channels exceeding 100 square metres in size (iii) bridges exceeding 100 square metres in size (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or

ACTIVITY NUMBER	LISTED ACTIVITY
	(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding- (aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.
13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.
14	The development of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.
19	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from- (i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.
24	The development of - (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; (ii) a road with a reserve wider than 13.5 metres, or where no reserve exists where the road is wider than 8 metres but excluding – (a) roads which are identified and included in activity 27 of Listing Notice 27 in Notice 2 of 2014; or roads where the entire road falls within an urban area
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 km – (iii) where the existing reserve is wider than 13.5 metres; or (iv) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.

ACTIVITY NUMBER	LISTED ACTIVITY
NEMA LISTING NOTICE 2: GNR.984	
6	The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; or (iii) the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.
15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.
17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).
21	Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.
27	The development of - (i) a national road as defined in section 40 of the South African National Roads Agency Limited and National Roads Act, 1998 (Act No. 7 of 1998); (ii) a road administered by a provincial authority; (iii) a road with a reserve wider than 30 metres; or (iv) a road catering for more than one lane of traffic in both directions; but excluding the development and related operation of a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010, in which case activity 24 in Listing Notice 1 of 2014 applies.
NEMA LISTING NOTICE 3: GNR. 985	
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA 'or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuary, whichever distance is the greater, excluding where such removal will occur behind the development setback line on even in urban areas; or iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.
NEM:WA LISTED ACTIVITIES GNR 921	

ACTIVITY NUMBER	LISTED ACTIVITY
Category B 4(7)	The disposal of any quantities of hazardous waste to land
Category B 4(8)	The disposal of general waste to land covering an area in excess of 200m^2 and with a total capacity exceeding 25 000 tons.
Category B 4(10)	The construction of a facility for a waste management activity listed in Category B of this schedule

4.2 DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

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

In broad terms the proposed Mokala Manganese mining project will comprise open cast activities, a dry crushing and screening plant, temporary overburden rock dumps, product and run-of mine stockpiles, topsoil stockpiles, mine related facilities such as workshops, stores and various support infrastructure and services. The resource to be mined is the manganese ore body of the Kalahari Manganese field. Further to this, the proposed project will require:

- The realignment of the R380 road on the farm Kipling 271 and across the remaining extent of the farm of Gloria 266 as this road currently bisects the proposed mining project site
- Upgrading the intersection to the Gloria Mine on Portion 1 of the farm Gloria 266
- Realigning a section of the Ga-Mogara drainage channel within the existing river channel. This realignment will extend onto the farm Umtu 281.

4.2.1 CONSTRUCTION PHASE

CONSTRUCTION PHASE ACTIVITIES

The key construction activities associated with the proposed project include:

- Site establishment of temporary offices, portable toilets, contractor lay down area; temporary workshop and wash bay and temporary non-mineralised waste storage facilities
- Clearing of vegetation in accordance with the relevant vegetation management procedures
- Stripping and stockpiling of soil resources and earthworks in accordance with the relevant soil conservation procedures
- Sourcing of material for construction
- Establishment of stormwater management facilities such as recycle water ponds and clean water realignment berms
- Installation of main tower tank, potable and process water tanks and the fire water tank
- Realignment of the R380 and establishment of internal haul roads
- Realignment of the Ga-Mogara drainage channel within the existing channel
- Construction of stockpile areas and platforms
- Construction of a crushing, screening and loading plant
- Establishment of access control facilities.

CONSTRUCTION PHASE FACILITIES

The construction phase facilities include:

- Contractor’s laydown areas
- Workshop/maintenance area for servicing and maintaining equipment and vehicles
- Temporary waste collection and storage area

- Store for the storing and handling of fuel, lubricants, solvents, paints and construction substances
- Parking area for cars and equipment
- Mobile site offices
- Portable ablution facilities
- Change houses
- Soil and overburden rock stockpiles
- Water management infrastructure
- Security and access control
- Main access road

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

WATER SUPPLY AND MANAGEMENT

Potable water

During the construction phase, potable water will be made available from on-site boreholes and will be subjected to a reverse osmosis water treatment process prior to use.

POWER SUPPLY AND USE

During the construction phase generators will be used as the primary power supply.

NON-MINERALISED WASTE MANAGEMENT

Domestic and industrial waste

Facilities for the temporary storage of non-mineralised waste associated with the project components will be provided. The types of waste that could be generated during the construction phase: hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants), general industrial waste (such as scrap metal, contaminated wood and building rubble), and domestic waste (such as packaging). These wastes will be temporarily handled and stored on site before being removed for recycling by suppliers and approved waste handling companies, reuse by scrap dealers or final disposal at permitted waste disposal facilities.

Sewage

Construction workers will make use of portable toilets that will be serviced on a regular basis. The sewage will be removed off-site by a certified contractor.

EMPLOYMENT AND HOUSING

The proposed project will allow for the creation of approximately 321 jobs during the construction phase. No contractors will be housed on-site as part of the proposed project. Instead construction workers will be accommodated in nearby towns.

OPERATING HOURS

It is anticipated that the construction phase will consist of 1 shift per day from 06h00 to 18h00 from Monday to Friday and a half day on Saturday, when work will consist of a half shift from 06h00 to 12h00. In cases where emergency action is required critical activities are required, motivation will be made for the extension of these hours within the provisions of the regulations.

CONSTRUCTION PHASE TIMING

It is envisaged that construction phase activities will commence during the first quarter of 2017 and will continue for a period of approximately 16 months.

4.2.2 OPERATIONS PHASE

MINING METHOD

The proposed project will comprise conventional open cast strip mining methods. Following site preparation and initial earthworks, drill and blast methods will be used to loosen the overburden rock and ore. Truck and shovel methods will be used to load and haul the box cut materials to the overburden rock stockpiles and the run-of-mine (ROM) to the relevant delivery point. Topsoil and overburden rock stripped during the mining operations will be used in the on-going rehabilitation processes. It is anticipated that approximately 1 to 1.3 million tons of ore will be mined per year. Table 5 summaries the associated open cast activities and Table 6 summarises the processing plant activities. A simplified conceptual flow diagramme is illustrated in Figure 3.

TABLE 5: SUMMARY OF OPEN CAST ACTIVITIES

ACTIVITY	DESCRIPTION
Topsoil stripping	Topsoil will be stripped and stockpiled separately in accordance with the conservation management procedures.
Drilling and blasting	Once the topsoil and overburden rock material has been removed, the hard overburden rock will be drilled as per a predetermined design. Charges for blasting will be designed to prevent excessive ground vibration, fly rock and air blast.
Removal of overburden rock	The removal of the overburden rock above the ore body will be done by means of dozing / loading and hauling with large equipment. Apart from the overburden rock stockpile that is required for the initial box cut, the overburden rock material will be placed into the previously mined out areas thus ensuring that the rehabilitation is done concurrently to the mining. Some overburden rock will be utilised for the establishment of platforms, internal haul roads and for construction of the fills and pavement layers to the diverted R380 Provincial road.
Removal of ore	The run of mine (ROM) ore will be transported via dump trucks to one of two designated ROM stockpiles (high grade and low grade) prior to being fed into the processing plant.

TABLE 6: SUMMARY OF PROCESSING PLANT ACTIVITIES

ACTIVITY	DESCRIPTION
Primary crushing station	An excavator will be used to load the ore delivered from the ROM stockpile to the primary crushing station (consisting of a jaw crusher) in

ACTIVITY	DESCRIPTION
	order to reduce the material to a size required by the downstream processes.
Screening station	The crushed material from the primary crushing station will be transported via conveyor to a surge bin that will in turn supply the screening station by another conveyor in order to screen out the required product specifications. Oversize material from the screening process will be sent to the secondary crushing station by means of conveyor. Correctly sized material will be fed to a product stockpile from where it will be moved by front end loaders and conveyors to the truck loading facility from where the product will be removed off-site via truck for sale to third parties. Provision has been made for a smaller supplementary product stockpile to accommodate any overflow from the product stockpile. Product from the supplementary product stockpile will be re-circulated back to the product stockpile. The fines screened out from the screening station will feed onto a conveyor that will deliver the fines onto a fines stockpile. Front end loaders will remove the fines from the stockpile and load onto trucks where the fines will be removed off-site via truck for sale to third parties. Provision has been made for a smaller supplementary fines stockpile to accommodate any overflow from the fines stockpile. Product from the supplementary fines stockpile will be re-circulated back to the fines stockpile.
Secondary crushing station	Oversize material from the screening station will be fed to a secondary crushing station (consisting of a cone crusher) in order to reduce any oversize material to the required specifications. The re-crushed material will be recirculated back to the screening station.
Transportation of product	The product will be fed onto the truck loading station by means of front end loaders from where the product will be removed off-site for sale to third parties.
Dust suppression	Dust suppression will be utilised at all material handling transfer points.
Rehabilitation	Rehabilitation will be concurrent with mining. Overburden rock will be used to backfill the open pit. Topsoil will be replaced on the overburden rock to enable vegetation to re-establish. Excess topsoil will be stored in berms and designated stockpile areas in accordance with conservation management procedures immediately adjacent to areas where this topsoil will be used for rehabilitation at the end of the life of mine.

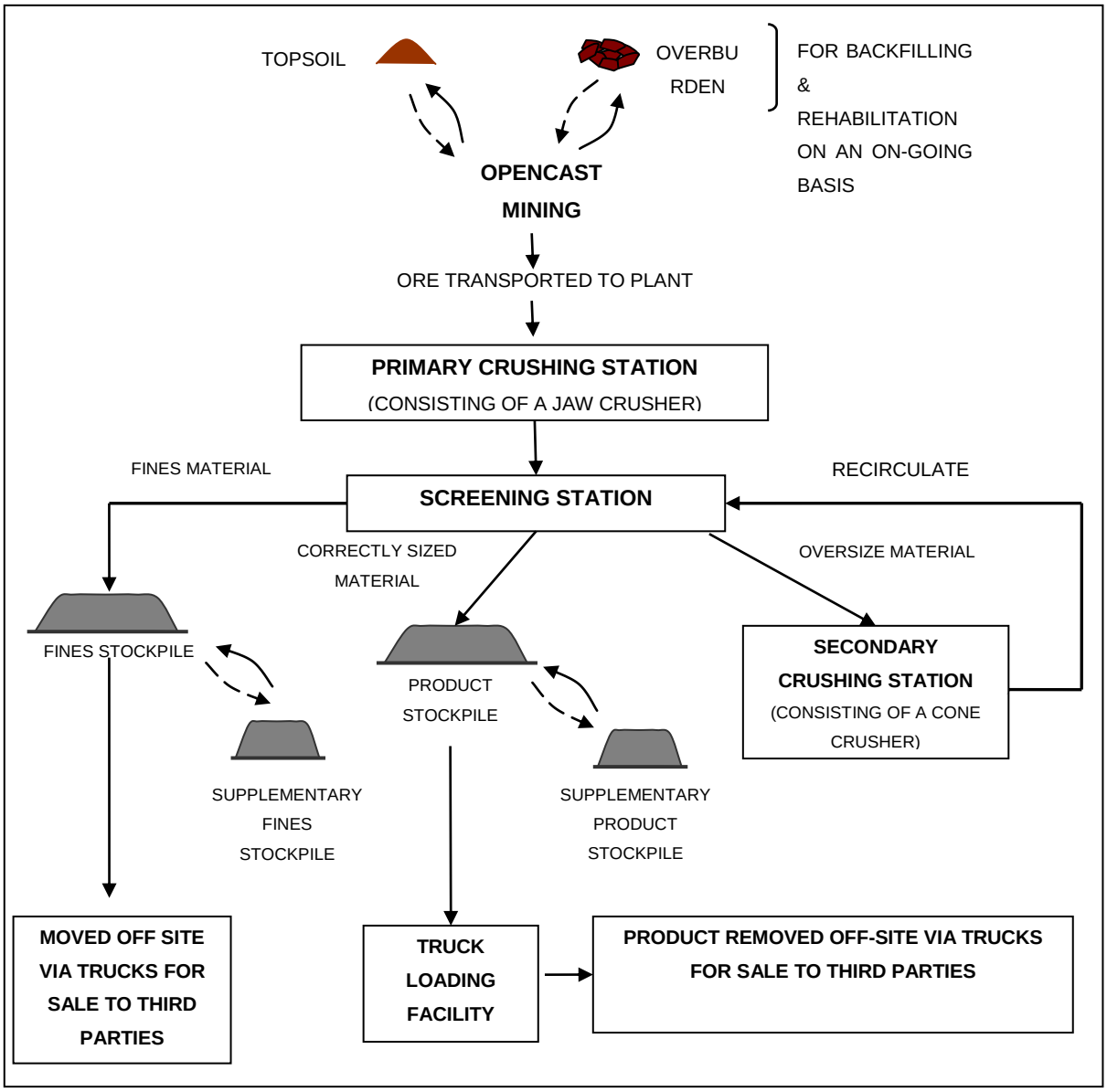


FIGURE 3: CONCEPTUAL PROCESS FLOW DIAGRAMME

SURFACE INFRASTRUCTURE

Operational phase surface infrastructure is listed below and is illustrated in Figure 4**.**

- Open pit area
- Plant area consisting of a Primary crusher, Screening plant and Secondary crushing
- Topsoil stockpiles and berms
- Temporary overburden rock stockpile and berm
- Truck loading facility, truck staging toilet facility and truck staging area
- Fines stockpiles, supplementary fines stockpile, product stockpile, supplementary product stockpile and ROM stockpiles (high grade and low grade)
- Stormwater management facilities such as berms and recycled water ponds (1 to 4)
- Sewage treatment plant

- Water treatment plant
- Water holding facilities (main tower tank, fire water tank and elevated potable and process water tanks)
- Fuel storage area and refuelling bays
- Generators and mini sub-station
- Weighbridge
- Administrative block: Offices, kitchen, canteen, training centre, mustering centre and clinic/emergency room
- Flammable store
- Change house and stores
- Workshop and washbay
- Control room
- Waste yard for the temporary storage of general and hazardous wastes
- Internal haul roads and turning circle
- Security gate and office

TRANSPORT SYSTEM

Roads

Access to the proposed project site will be via an upgrade to the existing intersection that services the Gloria Mine (Figure 4). The transportation of materials to and from the proposed project site will be via the R380. The R380 currently traverses the proposed project site as illustrated in Figure 4. This road will be diverted as part of the proposed project. The position of the road realignment is illustrated in Figure 4.

Within the proposed site boundary haul roads will be established. These haul roads will consist of a combination of widening existing gravel roads as well as the establishment of new haul roads. All haul roads will be within the proposed site boundary will be stabilised using an on-going treatment with a cationic 60% emulsion (or approved similar product).

Conveyors

Conveyors will be established within the proposed plant area to allow for the movement or ore between the primary crusher station, the screening station, the secondary crusher station and the Product Stockpile.

Pipelines

The proposed project will require the establishment of a pipeline network for the transportation of potable water, process water and sewage effluent.

WATER SUPPLY AND MANAGEMENT

Potable Water

Potable Water will be made available from on-site boreholes and will be subjected to a reverse osmosis water treatment process prior to use.

Process water

Process make-up water will be sourced from on-site boreholes, treated sewage effluent and/or water from pit dewatering (if available). In addition to this, re-cycled shower water will also be used as process water. Process water will not be subjected to treatment prior use.

Stormwater management

Water management facilities for the control of stormwater and for pollution prevention will be designed to meet the requirements of Regulation 704 (4 June 1999) for water management on mines. The two main principle sections of Regulation 704 (4 June 1999) that are applicable to the stormwater management of the proposed project include:

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

Clean water will be diverted away from dirty areas by means of channels and earth berms. Dirty water will be collected by means of drains and earth berms and will be contained in a dirty water circuit and will be re-used within the process.

POWER SUPPLY AND USE

Generators will be used as the primary power supply until such time as sufficient Eskom power becomes available in the future. A substation will be established near the plant area in order to supply the process plant with power.

MINERALISED WASTE MANAGEMENT

Overburden rock associated with the proposed project will be temporarily stockpiled and then backfilled into the open pit as part of the on-going rehabilitation initiative. Box cut material will be stored on-site until the final rehabilitation of the open pit void, when the box cut material will be placed back into the pit.

NON-MINERALISED WASTE MANAGEMENT

Domestic and industrial waste

Facilities for the temporary storage of non-mineralised waste associated with the proposed project will be provided. The types of waste that could be generated on site during the operational phase include: hazardous industrial waste (such as packaging for hazardous materials, used oil, lubricants), general

industrial waste (such as scrap metal and building rubble), medical waste (such as swabs, bandages) from the staff medical station, and domestic waste (such as packaging, canteen waste and office waste). These wastes will be temporarily handled and stored on site before being removed for recycling by suppliers, appointed waste contactors or reuse by scrap dealers or final disposal at permitted waste disposal facilities.

Sewage

All sewage will be treated in a package sewage treatment facility to be established on site. The treated sewage effluent will be re-used within the process. It is anticipated that sewage sludge will be removed off-site by a certified contractor for disposal at a licensed facility.

EMPLOYMENT AND HOUSING

The proposed project will allow for the creation of approximately 370 jobs during the operational phase. Nobody will be housed on-site as part of the proposed project. Operational workers will be accommodated in nearby towns.

OPERATING HOURS

At this stage it is expected that the proposed mine will be operational 24 hours a day for 5½ days a week (Monday to Friday and half of Saturday). It is anticipated that there will be three eight hour shifts (06h00 to 14h00, 14h00 to 22h00 and 22h00 to 06h00) per day during the operations phase.

LIFE OF MINE

It is anticipated that mining and processing activities will reach full production in 2018. The anticipated life of mine is approximately 15 years.

-10000

Existing Intersection to Gloria Mine

To Van Zylsrus

Security Gate and Office

Admin Block (Offices, kitchen, canteen, training centre, mustering centre, and clinic/ emergengy room)

Change House

Flammable Store

Stores

Waste Yard

Sewage Treatment Plant

Water Treatment Plant

Elevated Process and Potable Water Tanks

Fire Water Tank

Turning Circle

Weighbridge

Workshop and Washbay

Generators and Mini-Substation

Fuel Storage and Refuelling Bays

Product Stockpile

Supplementary Product Stockpile

Truck Loading Facility

Topsoil Berm

Truck Staging Toilet Facility

Truck Staging Area

Recycle Pond 3

Recycle Pond 4

Overburden Stockpile

Topsoil Stockpile Area

Supplementary Fines Stockpile

Fines Stockpile

Secondary Crushing

Conveyors

Screening Plant

Primary Crusher

Plant Area

Control Room

Main Tower Tank

Recycle Pond 2

Mine Haul Road

Recycle Pond 1

ROM Stockpile High Grade

ROM Stockpile Low Grade

R380

Overburden Berm

Open Pit Area

Conceptual River Re-Alignment

Topsoil Berm

Topsoil Berm

Existing Provincial Road (380)

Proposed Road Re-Alignment of R380

Ga-Mogara

Diggings 271

Kipling 271

1012

Gloria 266

1041

Umtu 281

271

N

-10000

Legend

- Proposed Infrastructure
- Proposed Road Re-Alignment of R380
- Proposed Open Pit Area
- Farm Boundaries
- Rivers
- Powerlines
- Railway
- Tracks/Paths
- Historical Borrow Pits

0 200 400 Meters

Scale: 1:10 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Figure 4

Mine Layout

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

710.0912.00001

April 2015

4.2.3 DECOMMISSIONING AND CLOSURE

The environmental objective for closure is to minimise the impacts associated with the closure and decommissioning of the mine and to restore the land to a useful land use not dissimilar to the pre mining land use. The conceptual closure plan objectives and principles include the following:

- Environmental damage is minimised to the extent that they are acceptable to all parties involved
- The land is rehabilitated to achieve a condition approximating its natural state, or so that the envisaged end use of wilderness and grazing is achieved
- All surface infrastructure, excluding the realignment of the R380 and the realignment of the Ga-Mogara drainage channel, will be removed from site after rehabilitation and the open pit will be completely backfilled.
- Mine closure is achieved efficiently, cost effectively and in compliance with the law.
- The social impacts resulting from mine closure are managed in such a way that negative socio-economic impacts are minimised.

5 POLICY AND LEGISLATIVE CONTEXT

Table 7 below provides a summary of the legislative context and policy applicable to the activity.

TABLE 7: LEGAL FRAMEWORK

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	REFERENCE WHERE APPLIED
Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA) and Regulations	As outlined in Table 8
National Environmental Management Act No. 107 of 1998 (NEMA)	As outlined in Table 8
Regulations 983 (Listing Notice 1), 984 (Listing Notice 2) and 985 (Listing Notice 3) in terms of NEMA	As outlined in 4.1
National Environment Management: Waste Act No. 59 of 2008 (NEM:WA)	Section 4.1
Regulation 921 in terms of NEM:WA	Section 4.1
National Water Act No. 36 of 1998 (NWA)	Section 8.8
Regulation 704 of 1999 in terms of the NWA	Section 8.1.3 and 8.8
National Environmental Management: Biodiversity Act No. 10 of 2004 (NEM:BA)	Section 8.4.1.5
Mining and Biodiversity Guideline (DEA *et al*, 2013)	Section 8.4.1.5
National Freshwater Ecosystem Priority Areas 2011 (NFEPA)	Section 8.4.1.5
National Forest Act No. 84 of 1998	Section 8.8
National Veld and Forest Fire Act No. 101 of 1998	Section 8.4.1.5
International Union for Conservation of Nature (IUCN)	Section 8.4.1.5
Conservation of Agriculture Resources Act No. 43 of 1983	Section 8.4.1.5
Northern Cape Nature Conservation Act No. 9 of 2009	Section 8.4.1.5
National Protected Areas Expansion Strategy 2008 (NPAES)	Section 8.4.1.5
South African National Botanical Institute (SANBI) Integrated Biodiversity Information	Section 8.4.1.5
Joe Morolong Local Municipality Integrated Development Plan	Sections 8.4.1.12
John Taolo Gaetsewe District Municipality Integrated Development Plan	Sections 8.4.1.12
National Heritage Resource Act No. 25 of 1999	Section 8.1.3, 8.4.1.11 and 8.8

This document has been prepared strictly 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 8.

TABLE 8: 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.	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
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 3
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 4.1
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 4.2
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 5
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 6
Period for which the environmental authorisation is required	-	Section 7
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 8
Details of the alternatives considered	Details of all the alternatives considered.	Section 8.1
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 8.2
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 8.3
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 8.4

SCOPING REPORT REQUIREMENT AS PER THE DMR TEMPLATE	SCOPING REPORT REQUIREMENTS AS PER THE 2014 NEMA REGULATIONS	REFERENCE IN THE SCOPING REPORT
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 8.5
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 8.6
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 8.7
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 8.8
The outcome of the site selection matrix. Final site layout plan	The outcome of the site selection matrix.	Section 8.9
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 8.10
Statement motivating the preferred site.	A concluding statement indicating the preferred alternatives, including preferred location of the activity.	Section 8.11
Plan of study for the environmental impact assess process	A plan of study for undertaking the environmental impact assessment process to be undertaken.	Section 9
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 9.1
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 9.2
Description of aspects to be assessed by specialists.	Aspects to be assessed by specialists.	Section 9.3
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 9.4
Proposed method of assessing duration significance	A description of the proposed method of assessing duration and significance.	Section 9.5
The stages at which the competent authority will be consulted	An indication of the stages at which the competent authority will be consulted.	Section 9.6
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 9.7

SCOPING REPORT REQUIREMENT AS PER THE DMR TEMPLATE	SCOPING REPORT REQUIREMENTS AS PER THE 2014 NEMA REGULATIONS	REFERENCE IN THE SCOPING REPORT
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 9.8
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 9.9
Other information required by the competent authority	Where applicable, any specific information required by the competent authority.	Section 9.10
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 10
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 11
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 12

6 NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

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

Development of the mine supports the national SA economy at a macro level by gearing exports that will leverage foreign income to the country. Direct economic benefits will be derived from wages, taxes and profits. Indirect economic benefits will be derived from the procurement of goods and services and the spending power of employees. This is in line with the Joe Morolong Spatial Development Framework (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 construction and 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 area is located in an area, being the Gamogara corridor, which is identified as a mining belt according to the Joe Morolong Spatial Development Framework (JMLM, September 2012). More detail relating to the need and desirability of the proposed project will be provided in the EIA and EMP report.

7 PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The life of mine is expected to be approximately 15 years.

8 DESCRIPTION OF PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED SITE

8.1 DETAILS OF ALL ALTERNATIVES CONSIDERED

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

The main project alternatives to be considered include:

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

8.1.1 PROPERTY OR LOCALITY

The property on which mining related activities takes places is dependent on the location of the ore body. It follows that only the remaining extent of the farm Gloria 266 was considered for the location of the open cast strip mine given that this is where the ore body is located.

8.1.2 TYPE OF ACTIVITY TO BE UNDERTAKEN

Opencast mining activities will be undertaken as part of the proposed project. Underground mining was considered, however due to the shallow nature of the ore body and the lack of a stable roof within the shallow area this option was not considered.

8.1.3 DESIGN OR LAYOUT

In order to reduce the carbon footprint, reduce energy use, limit haulage costs and to optimise mining, infrastructure is placed in close proximity to the ore body. If follows that infrastructure and mining activities will be located in the north eastern section of the proposed project site (Figure 4). Moreover, the placement of infrastructure in close proximity to the ore body allows for the western section of the proposed project area to remain undisturbed.

In terms of the placement of infrastructure in the north eastern section of the proposed project area, two main site layout alternatives were considered (Figure 5). While the open pit position is dictated by the location of the ore body, the aim is to place the remaining infrastructure as close to the open pit so as to limit the overall project footprint. In this regard, Option 1 includes the location of the proposed

infrastructure to the south of the existing R380 (Figure 5). Option 2 includes the realignment of the R380 and the location of the proposed infrastructure to the north and south of the current R380 (Figure 5).

A basic alternative selection matrix was compiled in order to determine the preferred alternative. Table 9 presents the results of the related site selection process. The ranking system is a simple three score relative ranking system. For each criterion, a score of one is allocated to the best option and a score of three to the worst. The option with the lowest total score is the preferred option.

TABLE 9: SITE SELECTION MATRIX FOR THE PROPOSED PLANT AREA

CRITERIA	RELATIVE RANKING		DISCUSSION/NOTES
	OPTION 1	OPTION 2	
Biodiversity (terrestrial and aquatic fauna, flora)	3	3	Both options would be located within sensitive areas (Section 8.4.1.5). Option 1 is located within the sensitive *Vachellia haematoxylon* Savannah and the Mixed *Vachellia* Savannah vegetation types. Option 2 is located within the sensitive *Vachellia haematoxylon* Savannah, the Mixed *Vachellia* Savannah and the riverine vegetation types. Further to this, both options would require the removal of protected species (EMS, March 2015).
Heritage resources	1	1	None of the proposed site layout options would interfere with known existing heritage resources (PGS, May 2013).
Soils and land capability	1	1	Soil type Clovelley is located within both proposed infrastructure option areas. The related land capability is grazing for both proposed infrastructure options (Terra Africa, April 2015).
Ground water regime and impacts on downstream users	1	1	Both site layout options are underlain by two aquifers, namely a shallow unconfined aquifer comprising Kalahari sands and a deeper fractured aquifer within the Dwyka, Mooidraai and Hotazel formation. No notable geological features were documented at either site layout options. The deeper fractured aquifer might show different characteristics due to potential preferred pathways along dykes and geological contacts.
Proximity to surface water resources	1	3	The Ga-Mogara drainage channel is located to the east of the proposed project area. Option 1 will not be located within the 1:100 year floodline or within 100m from the Ga-Mogara drainage channel, thereby complying with Regulation 704 (4 June 1999). Infrastructure associated with option 2 will be located within the 1:100 year floodline and within 100m from the Ga-Mogara drainage channel. It follows that the necessary exemptions will need to be obtained in terms of Regulation 704 (4 June 1999).
Visual impact	1	1	For both site layout options, the proposed plant area is surrounded by existing mining operations to the North, South and South East. It follows that in the context of existing surrounding mining operations both site layout options are not expected to materially influence existing negative visual impacts.
Proximity to residential areas from a dust and noise perspective	1	1	For both options, the sensitive receptors are the same. Given that both options are located to the north eastern section of the proposed project area, the proximity to residential areas does not differ significantly for there to be a preferred option.

CRITERIA	RELATIVE RANKING		DISCUSSION/NOTES
	OPTION 1	OPTION 2	
Sterilization of mineral resources	3	1	Should Mokala wish to mine underground in the future, Option 1 would sterilise a portion of future mineable resources along the orebody that runs northwest towards the Gloria Mine as it would not be possible to blast beneath the R380. Option 2, allows for the realignment of the R380 and as such underground mining in the future may be a viable option.
Interference with surface infrastructure	3	2	Option 2, will require the realignment of the R380 to allow for the establishment of the proposed infrastructure to the north and south of the current position of the R380. In addition to this, the realignment of the R380 will mean that the existing Telkom line that runs adjacent to the R380 will also need to be diverted. These realignments will require additional negotiations with the relevant departments. It is however important to note, that if the R380 and the Telkom line is not diverted, (Option 1) this infrastructure would be within the blast radius. It follows that this would cause major disruption to existing traffic along R380 as this road would need to be closed during blasting and the blasting activities are likely to damage the surface of the R380 as well as the overhead Telkom lines.
Viability of the proposed project	3	1	Approximately 6 million tons of the ore body extends under the existing R380. If the R380 was not diverted (Option 1), the loss of this ore would negatively influence the project viability.
Total	**18**	**15**	**Infrastructure layout option 2 is preferred**

8.1.4 TECHNOLOGY

Given the simplicity of the proposed project, no technology alternatives were considered in terms of ore processing. It follows that no technical alternatives were considered as part of the proposed project.

8.1.5 OPERATIONAL ASPECTS

WATER SUPPLY ALTERNATIVES

Mokala is currently investigating the use of water from on-site boreholes. Depending on the outcome of the investigations, if it is determined that water will not be able to be sourced from on-site boreholes, other alternatives for water supply will be considered. These alternatives include the Vaal Ga-Mogara Water Supply Scheme or sourcing water from neighbouring mines. Further details will be provided in the EIA and EMP report.

TRANSPORT ALTERNATIVES

Numerous road transportation alternatives are currently being considered. These include the transportation of ore from the mine via road to existing railway sidings located at Lohatla, Glossom from where the ore will be transport via rail to Port Elizabeth for sale to third parties. Alternatively the ore could be transported from the mine via road directly to Port Elizabeth, Durban or East London for sale to third parties.

Mokala is also investigating the possibility of transporting ore from the mine via road to existing loadout stations at neighbouring mines in the area, from where the ore will be transported via rail to either Port Elizabeth or Durban for sale to third parties. Neighbouring mines that are currently under consideration include the following:

- Kudumane Mine: The entrance to the mine is located approximately 2km south east of the proposed project area.
- Tshipi Borwa Mine: Located approximately 20km south southeast of the proposed project area
- Kalagadi Mine: Borders the proposed project area to the south.

Further detail regarding the various transportation alternatives that are currently being considered will be provided in the EIA and EMP report.

8.1.6 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.

In addition to the above this assessment also requires a comparison between the options of proceeding with the proposed realignment of the Ga-Mogara drainage channel and the realignment of the R380 to not proceeding with these activities. Proceeding with the proposed river realignment will allow Mokala to access underlying ore. If this ore is not accessed, approximately 2 million tons of ore will be lost and as such the project will not be viable. Similarly, not proceeding with the proposed realignment of the R380 will result in the loss of approximately 6 million tons of ore and as such the project will not be viable. Not proceeding with the proposed river realignment and the realignment of the R380 leaves the status quo.

-10000

N

Diggings

271

Kipling 271

1012

Diggings

104

271

R

Gloria 266

R380

Open Pit Area

1041

Ga-Mogara

Existing Provincial Road (380)

Umtu 281

271

-10000

Legend

- Alternative Site - Option 1
- Alternative Site - Option 2
- Proposed Open Pit Area
- Farm Boundaries
- Tracks/Paths
- Rivers
- Proposed Road Re-Alignment of R380 (Part of Option 2)

0 200 400 Meters

Scale: 1:10 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Figure 5

Infrastructure Site Location Alternatives

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

710.0912.00001

April 2015

8.2 DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

This section describes the information provided to landowners, adjacent landowners, regulatory 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.

8.2.1 DATABASE

The proposed project's public involvement database was developed by sourcing IAPs details relating to immediate landowners and adjacent landowners by means of a deed search. This information was verified during a social scans including site visits 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 meetings. 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.

8.2.2 BACKGROUND INFORMATION DOCUMENT (BID)

A BID was compiled in both English and Afrikaans and distributed by hand (at the scoping meetings), via e-mailed and posted to IAPs and regulatory authorities on the project's public involvement database. The purpose of the BID was to inform IAPs and regulatory authorities about the proposed project, the environmental assessment process, the current status of the environment, possible environmental impacts, and means of providing input into the environmental assessment process. Attached to the BID was a registration and response form, which provided IAPs with an opportunity to submit their names, contact details and comments on the project. A copy of the BID is provided in Appendix E.

8.2.3 REGULATORY AUTHORITIES NOTIFICATIONS

Regulatory authorities were informed in writing of the proposed project. Proof of this notification is provided in Appendix E. The following regulatory authorities were notified:

- 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)
- The Northern Cape Department of Rural Development and Land Reform and (DRDLR)
- Department of Public Works, Roads and Transport (DPWRT)
- John Taolo Gaetsene District Municipality

- Joe Morolong Local Municipality
- Ward councillor (Ward 4).

8.2.4 SITE NOTICES AND ADVERTISEMENTS

Site notices in English and Afrikaans were placed at key conspicuous positions in and around the proposed project site and block advertisements were placed in the Kalahari Bulletin and Kathu Gazette on 12 March 2015 and 14 March 2015, respectively. Photographs of the site notices and copies of the newspaper advertisements are provided in Appendix E.

8.2.5 SCOPING MEETINGS – IAPS AND REGULATORY AUTHORITIES

IAPs were notified of the public meeting in the following manner:

- Formal invitations to the public meeting sent via email, fax and post (Appendix E)
- Advertisements placed in the Kalahari Bulletin and Kathu Gazette (Appendix E)
- Site notices placed in and around the proposed project site (Appendix E).

Regulatory authorities were notified of the regulatory authorities meeting in the following manner:

- Telephonic discussions to notify regulatory authorities of the proposed date for the authorities meeting
- Formal invitations to the regulatory authorities meeting sent via email, fax and post (Appendix E) including telephonic discussions.

The following public scoping and regulatory authority meetings were held for the proposed project:

- One (1) regulatory authorities meeting was held on 15 April 2015 at the Hotazel Recreation Club. Meeting attendance registers and minutes are provided in Appendix E.
- One (1) public scoping meeting was held on 15 April 2015 at the Hotazel Recreation Club. Meeting attendance registers and minutes are provided in Appendix E.
- A pre-application meeting was held with the DMR on 21 April 2015 at the department offices in Kimberley. Meeting attendance registers and minutes are provided in Appendix E.

The purpose of the public scoping and regulatory authorities meetings 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 potential 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

8.2.6 RELEVANT REGULATORY AUTHORITIES AND IAPS

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

- Regulatory 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)
  - The Northern Cape Department of Rural Development and Land Reform (DRDLR)
  - Department of Public Works, Roads and Transport (DPWRT)
  - John Taolo Gaetsene District Municipality
  - Joe Morolong Local Municipality
  - Ward councillor (Ward 4).
- Parastatals:
  - Telkom
  - Transnet
- Non-government organisation
  - Tshiping Water Use Association
  - Kalagadi Water User Forum
- Others:
  - Landowners and land users
  - Surrounding mines

8.2.7 REVIEW OF THE SCOPING REPORT

The scoping report will be made available for public and regulatory authorities review from **10 July to 11 August 2015**. Full copies of the scoping report will be available for public review at the following venues:

- Joe Morolong Local Municipality
- John Taolo Gaetsewe District Municipality
- Hotazel, Black Rock (For both Black Rock and Gloria mine village) community public libraries
- Kuruman and Kathu town libraries
- SLR's offices in Johannesburg
- Electronically on a CD will be made available on request.

Summaries of the scoping report will be sent by post or e-mail to all IAPs and authorities that are registered on the public involvement database. In addition, IAPs will be notified when the draft scoping report is available for review via SMS.

8.3 SUMMARY OF ISSUES RAISED BY IAPS

A summary of the issues and concerns raised by IAPs and regulatory authorities is provided in Table 10 below.

TABLE 10: SUMMARY OF ISSUES RAISED BY IAPS AND REGULATORY 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				
Comment raised by E E Reynecke	X	01 March 2015 during the social scan	I am concerned about groundwater availability.	An independent groundwater specialist has been appointed as part of the proposed project to determine the impact that the project will have on groundwater quality and quantity. The terms of reference for the groundwater investigation are included in Section 9.3.7.
Comment raised by Ryno van Schalkwyk,		01 March 2015 during the social scan	I am concerned about the impact that the project will have towards groundwater availability.	
Comment raised by Lourika Delaport (L van der Merwe)		01 March 2015 during the social scan	My concern about the proposed project is groundwater availability.	
Comment raised by Gert A Noeth		01 March 2015 during the social scan	I am concerned about groundwater availability.	
Comment raised by Jurie Kriek		15 April 2015 at the public scoping meeting	There is a concern that the shallow aquifer is dry. This could be due to the sinkholes upstream at the Kumba Mine. This project will add additional pressure on the existing aquifers which will have an impact on downstream users.	
			I have boreholes in the area and I am concerned about the impacts that the project will have on existing groundwater levels.	
Comment raised by Louis Hauman		15 April 2015 at the public scoping meeting	A major problem in the area is underground water. The river does not flow and aquifers don't get water. In addition, the cumulative impacts by each mine must be calculated. The Kumba Mine is currently the biggest user of groundwater.	
Comment raised by Eben Anthonissen		15 April 2015 at the public scoping meeting	The Ga-Mogara drainage channel has limited surface water run-off. The first aquifer is not replenishing. This has a major impact on users as far as Kathu. The proposed project will only	

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			add additional pressure.	
			Groundwater usage by Mokala will just add more pressure on existing users. More pressure on the Vaal Ga-Mogara pipeline which also affect livestock.	
Comment raised by Gert Theart		15 April 2015 at the public scoping meeting	We would like to know what the cone of depression is for the project taking into account other mines in the area. When considering the other mines in the area, Mokala will cause the existing cone of depression to extend. We are not interested in seeing a site specific cone of depression.	
			The groundwater resources in the area are already under pressure. The existing mining companies shift blame where groundwater shortages are concerned. There needs to be a proper way of managing water usage for each mining company in order to assess the cumulative impacts on groundwater.	
Comment raised by Ryno van Schalkwyk,		01 March 2015 during the social scan	I am concerned about the impact that the proposed project will have on existing transport networks.	An independent traffic specialist has been appointed as part of the proposed project to determine the impact that the project will have towards the existing road network. The terms of reference for the traffic impact assessment are included in Section 9.3.13.
Comment raised by Jurie Kriek		15 April 2015 at the public scoping meeting	If Mokala is intending on mining approximately 1.3 million tonnes of ore per year this means that approximately 300 trucks will be leaving the mine every day. That will require a highway. The existing roads cannot accommodate that number of trucks.	
Comment raised by Ryno van Schalkwyk,		01 March 2015 during the social scan	I am concerned about housing.	No workers will be housed on-site as part of the proposed project. Instead workers will be accommodated in nearby towns.
Comment raised by Gert A Noeth		01 March 2015 during the social	I am concerned that the proposed project will	Mokala is more than willing to be part of

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
		scan	result in an increase in veld fires.	existing forums and initiatives in the area which aid in managing the environment effectively. Mokala will also implement fire breaks around the project area.
Comment raised by Jan Theart	X	15 April 2015 at the public scoping meeting	The area is well known for veld fires. Will Mokala join other mining companies in assisting with veld fires?	
			Has the application for re-zoning of the land been submitted as the current land zoning is agricultural?	Mokala is aware that a re-zoning application needs to be submitted; however this has not been done yet.
			When will blasting take place? The law states that blasting should only take place during the day. Mokala should also be aware that there is an existing forum which assists in notifying people of planned blasts.	The possible management measures outlined in Table 21 indicates that blasting activities should be limited to the day time hours and that scheduled blasts need to be communicated with IAPs. These management measures will be refined as part of the EIA and EMP phase of the project.
			There is a Kalagadi Forum which is in the process of becoming a water use association. We would like Mokala to form part of the association	Mokala is more than willing to be part of existing forums and initiatives in the area which aid in managing the environment effectively.
Comment raised by Jurie Kriek		15 April 2015 at the public scoping meeting	The life of mine, being approximately 15 years is a short period for a project with such anticipated impacts, particularly the realignment of the Ga-Mogara drainage channel. We hope that your plan is not to mine, pack up and leave the area dry.	Your concerns have been noted and will be addressed as part of the EIA and EMP phase. As part of the proposed project, a closure cost report and traffic study will be undertaken. The related terms of reference are included in Section 9.3.15 and 9.3.13 respectively.
			How much will Mokala contribute to road maintenance? Some mining companies in the area have contributed towards upgrading existing roads. The roads in this area are not designed for heavy vehicles especially trucks.	
Comment raised by Louis Hauman		15 April 2015 at the public scoping meeting	Has the mining right been granted?	The mining right application was submitted on 03 July 2015. For the mining right to be granted the DMR needs to approve the EIA

INTERESTED AND AFFECTED PARTIES	DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			and EMP report in support of a mining right application. The environmental assessment process should take approximately 300 days as per legislated timeframes from the date of submission of the mining right application. It is only after these 300 days that the DMR should make a decision as to whether or not to grant the mining right.
		How much manganese do you intend to mine per year?	Approximately 1.3 million tonnes per annum.
		The Ga-Mogara drainage channel is going to flow again in 2025.	This has been noted.
		The wind direction is from the North West not South East; please update this in your documents.	Reference to the wind direction from the north west has been noted in Section 8.4.1.3.
		In your report it needs to be clearly indicated what amount of water is required for dust suppression.	With reference to Section 9.3.6, a hydrological study will be undertaken as part of the proposed project. One of the outputs of this study is the compilation of a water balance which will indicate the volume of water required for dust suppression. The amount of water required for dust suppression will be provided in the EIA and EMP report. In addition to this the hydrology report will be attached as an appendix to the EIA and EMP report.
		The impact that the project will have on the river flow must be calculated.	The total mean annual run-off that will be lost to the overall catchment will be calculated as part of the hydrological study (Section 9.3.6) and the impact of this loss will be assessed as part of the EIA and EMP report. In terms of the river crossing and the re-alignment of the Ga-Mogara drainage channel 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)
				note that the designs allow for the natural flow of the system to continue.
Comment raised by Eben Anthonissen	X	15 April 2015 at the public scoping meeting	Will Mokala wait for a water use license to be issued by the Department of Water and Sanitation before commencing with mining? In our experience, mines operate without a water use license.	Mining will not take place until feedback has been received from the Department of Water and Sanitation.
			How deep is the ore body?	The depth of the ore body ranges between 60m to 130m.
			The financial provision must include the realignment of the Ga-Mogara drainage channel and the realignment of the R380. Will these be returned back to their original positions?	The re-alignment of the R380 and the Ga-Mogara drainage channel within the existing channel will be permanent. It is important to note that once the R380 has been diverted, this road becomes the responsibility of the South African National Roads Agency. It is for this reason that the financial provision will not cater for the relocation of the R380 to its original alignment. Further to this, the design of the Ga-Mogara drainage channel channel re-alignment will be as natural as possible, will allow for the continuation of natural flow (when this occurs) and will also allow for the re-establishment of natural vegetation. It follows that once the Ga-Mogara drainage channel has been realigned within the existing river channel no further rehabilitation is required and will therefore not be catered for in the financial provision.
			What will happen to the treated sewage effluent?	The treated sewage effluent will be re-cycled / re-used within the plant process.
			Where is Mokala planning on disposing of general and hazardous waste? The closest landfill site is in Kuruman and they are not	Mokala will investigate all lawful methods to handle and dispose of both domestic and hazardous waste. The proposal will be

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			accepting additional waste. Due to this, many mining companies resort to dumping their waste next to the roads which poses a major challenge for farmers. If our livestock eat waste material, it can be fatal which results in a loss of income.	detailed in the EIA and EMP.
			What is the depth of the shallow aquifer?	The depth of the shallow aquifer is expected to be between 10 and 50m below ground level.
			Can the quarterly monitoring reports be made available to the public and the farmers' associations? We have existing arrangements with other companies in the area. We are also willing to provide access to our boreholes for monitoring for baseline purposes.	Your request has been noted and will be forwarded to Mokala. A hydrocensus has been undertaken for the project. Farmers in the area were contacted in order to gain access to their boreholes.
Comment raised by Gert Theart			Yes, that is correct. SLR was at my farm and took measurements.	Thank you for this clarification.
Comment raised by Eben Anthonissen			It is important to note, that when it comes to protected plant species, the Tolbos is not taken into consideration.	The *Boophane disticha* (Tolbos) is considered to be declining in terms of the IUCN. With reference to Section 8.4.1.5, the Tolbos was not specifically identified on-site during the site survey undertaken by the biodiversity specialist.
			We are concerned that the opencast mine will produce a significant amount of dust especially during blasting. Hotazel is located North East of the proposed project site. Given that the prevailing wind direction is from the north west, Hotazel will be covered with dust.	An independent air quality specialist has been appointed as part of the proposed project to determine the impact that the project will have towards ambient air quality. The terms of reference for the air quality impact assessment are included in Section 9.3.9.
			What is Mokala's intention regarding the transportation of ore?	With reference to section 8.1.5, transportation alternatives that are being investigated include road and a combination of road and rail. Further detail will be provided in the EIA and EMP report.
			We would prefer if Mokala made use of rail to transport ore as opposed to road.	

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			Will the proposed mine make use of local labour?	Mokala will make use of local labour as far as practically possible.
			We would like a visual impact assessment to be undertaken for the project. Our concern is lighting at night from the mine.	With reference to Section 9.3.10 a qualitative visual assessment will be undertaken given that the proposed project is surrounded by existing mining operations to the north, south and south east and as such the proposed project is not expected to present negative visual views that differ from the current baseline situation. Your concern pertaining to night-time lighting will however be taken into consideration as part of the EIA and EMP.
Comment raised by Bonolo Lekwa	X	15 April 2015 at the public scoping meeting	Please can SLR ensure that copies of the relevant reports are made available at the Black Rock Library?	This will be done.
			Mokala must take note that there are existing plans to expand the capacity of the Vaal Ga-Mogara Pipeline by Sedibeng Water.	Thank you for your comments. These are being considered as part of the related project investigations and planning.
Comment raised by Thivha Tshithavhane			It is strongly advised that Mokala applies to Sedibeng Water to obtain water from the Vaal Ga-Mogara water supply scheme in order to benefit. It was mentioned that one of the water supply alternatives was to source water from neighbouring mines. This will not be possible due to the water shortages in the area.	
Comment raised by Bonolo Lekwa			Assmang undertook a heritage impact assessment during the expansion of the railway bridge. Some stone age tools were found near the Ga-Mogara drainage channel.	With reference to section 8.4.1.11, two stone age heritage sites have been identified on the remaining extent of the farm Gloria 266. Further to this, an independent heritage specialist has been appointed to confirm if any other significant heritage resources are located where infrastructure has been proposed on portion 1 of the farm Gloria, the

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
				farm Kipling 271 and the farm Umtu 281. The related terms of reference is included in Section 9.3.11.
Comment raised by Thivha Tshithavhane		15 April 2015 at the public scoping meeting	Will the reports be made available for review in any of the communities?	Yes.
			I think that it is important that communities receive hard copies of the reports. I will send you a list of which communities should receive reports.	Reports will be placed in the closest communities namely: Hotazel and Black Rock (For both Black Rock and Gloria mine village). In addition, Summaries will be distributed to all IAPs that have registered and electronic copies of the report can be made available on request.
Comment raised by Gert Theart	X	15 April 2015 at the public scoping meeting	There are many mines requesting access to the Ga-Mogara Pipeline from Sedibeng Water. If Mokala also applies for water from this scheme, more pressure will be placed on the pipeline.	With reference to Section 8.1.5, Mokala's preferred means of sourcing water for the proposed operation is from on-site sources. Mokala is currently investigating if this option is feasible or not. Depending on the outcome of the investigations, if it is determined that water will not be able to be sourced from on-site boreholes, other alternatives for water supply will be considered. These alternatives include the Vaal Ga-Mogara Water Supply Scheme or sourcing water from neighbouring mines. Further information will be provided in the EIA and EMP report.
Organs of state				
Issues raised by Raisibe Sekepane from the Department of Mineral Resources	X	21 April 2015 at the pre-application meeting	In terms of the proposed road realignment and the realignment of the Ga-Mogara drainage channel, has SLR consulted with the Department of Roads and Public Works and the Department of Water and Sanitation (DWS) respectively?	Both departments have been notified of the proposed project. In this regard, a background information document was distributed to both departments. In addition to this, both departments were invited to the regulatory authorities meeting. These departments will continue to be involved

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
				throughout the environmental assessment process.
			What is the depth of the ore body?	The depth of the ore body ranges between 60m to 130m.
			The impact assessment needs to focus on the cumulative impacts.	Your comment has been noted and will be addressed as part of the EIA and EMP phase.
			Please can you provide details regarding the grade of the ore and market requirements? We acknowledge that Mokala intends to backfill the open pit, however in our experience with existing mining operations in the area, backfilling does not take place even it if is a commitment in an environmental management programme report. The reason for this is that the grade of the ore and market conditions are poorly understood and mines end up not having the money to backfill open pits.	Mokala will produce a minimum manganese ore grade of 34% with an average grade of 37.5%. This will depend on the price of the manganese at any given stage of the project. Provision for rehabilitation is a legal requirement and is reviewed independently each year and will form part of concurrent backfilling.
			In terms of the water system on-site, will it be a closed loop?	Yes. The intension is to manage all dirty and recycle water on-site in accordance with Regulation 704 (4 June 1999).
Department of Environmental Affairs (Department on Environment and Nature Conservation – Northern Cape)				
Issues raised by Moses Ramakulukusha from the Department of Environment and Nature Conservation	X	15 April 2015 at the regulatory authorities meeting	Please send me a list of specialists that will be undertaking work for the proposed project. I would like to know what specialist studies will be conducted for the project?	Refer to Section 9.3 for the specialist terms of reference.
			Will you determine the carbon footprint of the proposed project? I am aware that it is currently not legislated and thus not mandatory but be aware that it is what the environmental department is moving towards to for future EIA processes.	Provision has been made for a carbon footprint assessment to be undertaken as part of the environmental management programme (Section 8.8). This will be done if the project is approved.

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			It is important that SLR engages in an effective public consultation process. Was the proposed project advertised in newspapers? What other means were used to inform interested and affected parties (IAPs) about the proposed project? I do not think newspapers are an effective means of informing IAPs about a project.	The proposed project was advertised in the Kathu Gazette and the Kalahari Bulletin. Site notices were also placed in and around the proposed project site. A social scan was undertaken to identify IAPs such as landowners, land users, non-government organisations, regulatory authorities and surrounding mining companies. Identified IAPs were notified of the proposed project by means of background information documents and site notices placed within and surrounding the proposed project site. Further detail is provided in Section 8.2.
			What communities have been involved as part of the proposed project? Has the ward councillor been engaged?	The relevant ward councillor has been notified of the proposed project and was invited to the regulatory authorities meeting. A land claim has been lodged on the farm Kipling 271 by the Tsineng Communal Association (CPA). The Tsineng CPA has been notified of the proposed project and was invited to the public scoping meeting. The communities of Black Rock, Hotazel are the two closest communities. People within these communities have both been notified
			Has the environmental authorisation application been submitted to the Department of Mineral Resources (DMR) for listed activities in terms of the NEMA/NEM:WA? Similarly have water use activities been identified, that required authorisation from the Department of Water and Sanitation?	At the time of the public meetings the application had not been submitted. Since then the application was submitted as part of the mining right application process.
			Was the DMR invited to this meeting and have they been to site?	The DMR was invited to this regulatory authorities meeting. The DMR has not been

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
				to site yet as part of the proposed project.
			Are you aware of the Hotazel town expansion project? The town will be expanding towards the direction of the project. The expansion is currently not approved but it is definitely in the pipeline. Black Rock had to adjust their mining plans because of the proposed expansion. Please also note that BHP Billiton owns the land where the town will be expanding.	With reference to Figure 6 the proposed project is not located within the Hotazel town expansion area.
			Will the project rely on the municipal sewage facilities?	No. It is proposed that an on-site sewage treatment plant will be established in order to treat any sewage generated as part the proposed mine.
			Will a geotechnical study be undertaken for the project?	Yes, Mokala is currently busy with the geotechnical study.
			Please assess the post land rehabilitation and potential.	As part of the proposed project a closure cost estimate will be undertaken. The related terms of reference are included in Section 9.3.15.
			Please assess what impact the proposed project will have towards the agricultural potential of the project site?	As part of the proposed project a land capability study will be undertaken to determine the agricultural potential of the proposed project area. The related terms of reference are included in Section 9.3.3.
			Will there be a biodiversity offset.	This will be determined by the biodiversity specialist with input from the relevant authorities and will be outlined in the EIA and EMP report. The related terms of reference are included in Sections 9.3.5.
OTHER INTERESTED AND AFFECTED PARTIES				
Issue raised by Mr Wayne Green from Telkom	X	14 April 2015 via email	Telkom SA SOC Ltd is affected by this proposal. Existing overhead plant is affected between	Mokala is aware that the proposed project will require the realignment of the Telkom line

INTERESTED AND AFFECTED PARTIES		DATE COMMENTS RECEIVED	ISSUES RAISED	EAPS RESPONSE TO ISSUES (AS AMENDED FOR THE PURPOSES OF THE SCOPING REPORT)
			Hotazel and Santoy (Black Rock). If any plant is damaged or must be moved, the cost involved will be repayable. Please note that important overhead route is affected and should be treated as important. On completion of this project, please certify that all requirements as stipulated in this letter have been met. Please note that should any Telkom SA SOC Ltd infrastructure has to be relocated or altered as a result of your activities the cost for such alterations or relocation will be for your account in terms of section 25 of the Electronic Communication Act. This approval is valid for 6 months, after which re-application must be made if the work has not been completed.	that runs parallel to the R380. In this regard, negotiations are underway between Mokala and Telkom.
Comment received from L Ramatladi from Transnet		24 April 2015 via email	No objections as the proposed mine is more than 5km away from Transnet Freight Rail Property at Hotazel Station and no foreseen issues with regards to the project.	Thank you for your comment.
Comment received by Seikaneng Keatlegile		16 March 2015 via email	I am interested in job opportunities.	Your comment has been noted. The proposed project will create approximately 321 construction job opportunities and approximately 370 operational job opportunities.
Comment raised by Errol Motlhatlhedi		15 April 2015 at the public scoping meeting	What is the difference between construction and operational jobs?	Construction jobs are required for a few months at a time while the mine is being established. Operational jobs are required for a longer period of time while the mine is operational, which in the case of the proposed project is approximately 15 years.

X = indicates IAPs that were consulted

8.4 THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE SITES

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.

8.4.1 TYPE OF ENVIRONMENT AFFECTED BY THE PROPOSED ACTIVITY

8.4.1.1 Geology

INTRODUCTION

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

- The type of soils present since the soils can be derived from the parent rock material
- 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. However, a basic description of the regional geology is provided below. More detailed information will be provided in the EIA and EMP.

Soil types are discussed in section 8.4.1.4, groundwater in section 8.4.1.7 and paleontological resources in section 8.4.1.11.

DATA SOURCES

Information in this section was sourced from the project team.

RESULTS/CONCLUSION

Regional geology

The world's largest land based sedimentary manganese deposit is contained in the Kalahari Manganese Field, situated 47 km north-west of Kuruman in the Northern Cape. The Kalahari Manganese Field comprises five erosional, or structurally preserved, relics of the manganese bearing Hotazel Formation of the Paleoproterozoic Transvaal Supergroup. These include the Mamatwan-Wessels deposit (also known as the main Kalahari Basin), the Avontuur and the Leinster deposits, and the Hotazel and Langdon Annex/Devon deposits.

Within the main Kalahari Basin (from which the resources will be mined) is the largest of the five deposits in the Kalahari Manganese Field, comprising a basin with a strike length of approximately 56 km and a width varying between 5 and 20 km. The proposed Mokala project area is located towards the eastern end of the basin.

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

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

DATA SOURCES

Information in this section was sourced from the project team.

RESULTS/CONCLUSION

The proposed project area is located in a relatively flat area with gentle slopes. The elevation on site varies from 1087 m to 1107 m above mean sea level (mamsl). The Ga-Mogara drainage channel is located on the eastern boundary of the proposed project site.

8.4.1.3 Climate

INTRODUCTION

Climate can influence the potential for environmental impacts and related mine design. 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; and
- Wind could influence erosion, the dispersion of potential atmospheric pollutants, and rehabilitation planning.

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

DATA SOURCES

Information in this section was sourced from the surface water study (SLR, February 2015) and the air quality study (Airshed, April 2015) being undertaken as part of the proposed project.

RESULTS/CONCLUSION

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, February 2015).

Rainfall

Rainfall data for the proposed project site was sourced from the South African Weather Station for weather stations Winton and Milner. In addition to this rainfall data was also sourced from the DWS database for the Kuruman weather station including the Water Resources of South Africa manual (WR2005). A summary of the monthly rainfall data from these various stations is included in Table 11 below (SLR, February 2015).

TABLE 11: SUMMARY OF MONTHLY RAINFALL FOR THE PROPOSED PROJECT SITE (SLR, FEBRUARY 2015)

MONTH	RAINFALL (MM)			
	WINTON - 392148 W	MILNER - 393083 W	KURUMAN - D4E004	WR2005
January	56.3	59.8	85.3	63.8
February	63.5	63.0	84.7	52.2
March	62.7	72.3	92.7	53.3
April	34.2	39.9	49.1	29.5
May	16.4	19.2	23.9	10.0
June	5.1	9.1	7.5	4.4
July	3.4	1.3	3.7	2.2
August	5.5	5.4	8.4	3.4
September	6.2	6.4	8.0	8.5
October	14.7	19.2	25.9	26.2
November	24.5	31.5	42.9	40.5
December	42.3	44.5	45.9	50.1
Annual	**335**	**372**	**478**	**344**

Evaporation

Monthly evaporation data was obtained from the Water Resources of South Africa manual, (WR2005, 2009). Below in Table 12 is a summary of the adopted evaporation data for the proposed project area (SLR, February 2015).

TABLE 12: SUMMARY OF EVAPORATION DATA (SLR, FEBRUARY 2015)

MONTHS	SYMONS PAN EVAPORATION (MM)	LAKE EVAPORATION FACTOR	LAKE EVAPORATION (MM)
January	276.9	0.84	232.6
February	209.9	0.88	184.8
March	193.3	0.88	170.1
April	144.1	0.88	126.8
May	114.7	0.87	99.8
June	91.0	0.85	77.3
July	106.0	0.83	88.0
August	153.8	0.81	124.5
September	213.0	0.81	172.5
October	269.7	0.81	218.4
November	248.0	0.82	232.9
December	294.6	0.83	244.5
Total	2351	N/A	1972

Temperature

Monthly mean, maximum and minimum temperatures for the proposed project area are provided in Table 13 below. Temperatures ranged between -0.6 °C and 35 °C. During the day, temperatures increase to reach maximum at around 15:00 in the afternoon. Ambient air temperature decreases to reach a minimum at around 06:00 just before sunrise (Airshed, April 2015).

TABLE 13: MONTHLY TEMPERATURE DATA (AIRSHED, APRIL 2015)

MONTHS	MINIMUM	MAXIMUM	AVERAGE
January	15.3	35.0	26.4
February	14.1	34.1	25.8
March	10.1	32.5	24.5
April	4.4	29.9	18.7
May	2.4	26.9	15.4
June	-0.6	22.3	10.8
July	1.0	21.7	11.4
August	0.4	28.3	13.1
September	2.1	27.8	16.8
October	6.7	32.3	20.5
November	8.8	34.7	23.3
December	11.9	35.0	25.2

Wind

Wind direction within the proposed project area shows considerable differences between the seasons. During summer, autumn and winter the dominant winds are from the east, northeast and south, while in spring, the southerly winds dominate. The strongest winds were also from the east and northeast and occurred mostly during the day (06:00 to 18:00). A distinct increase in winds from the south occurred at night (18:00 to 06:00) (Airshed, April 2015). Wind direction from the North West also occurs within the proposed project area.

8.4.1.4 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. Soil determines the type of land use the area is suitable for, for example, soil with low nutrients may not be able to support unassisted crop farming.

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

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

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

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

DATA SOURCES

Information in this section was sourced from the soils, land use and land capability study being undertaken for the proposed project (Terra Africa, March 2015).

RESULTS/CONCLUSION

Soil forms

The soil forms located within the proposed project area include Clovelley, Brandvlei, Kinkelbos, Molopo and Witbank. These soil types are 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. In the south eastern section of the proposed project area, the soils have been disturbed by historical borrow pit activities (Further information is provided in Section 8.4.2). These disturbed soils (Witbank soil forms) have been so profoundly affected by human disturbance that their natural genetic character (i.e. their link to the natural factors of soil formation) has largely been destroyed.

Land use capability

The Clovelly soil forms have arable land use capability which could have been suitable for dryland crop production should the climate have been more favourable with regards to rainfall. Due to the climate restrictions the land use capability of the Clovelly soil forms within the proposed project area is mainly grazing. The Kinkelbos soil forms are associated with wetland type land use capabilities while the Witbank, Molopo and Brandvlei soil forms are associated with wilderness land use capabilities.

8.4.1.5 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.

The establishment of project infrastructure as well as project-related activities have the potential to result in a loss of habitat through the destruction/disturbance of vegetation and/or contamination of soil and/or water resources, 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, to guide the project planning in order to avoid sensitive areas where possible, to determine how best to conserve the fauna and flora in the area and allow for proper rehabilitation of the site once mining ceases.

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.

DATA SOURCE

Information in this section was sourced from the biodiversity study being undertaken for the proposed project (EMS, March 2014) and on-site observations by the SLR project team.

RESULTS/CONCLUSION

Flora (Natural plant life)

The proposed project area falls within the Kathu Bushveld and the Gordonia Duneveld and consists of five vegetation types. These vegetation types include the Mixed *Vachellia* (previously known as *Acacia*) Savannah, *Senegalia mellifera* Mixed Woodland, *Vachellia haematoxylon* Savannah, *Tarchonanthus camphoratus* Scrub and Riverine Vegetation (EMS, March 2015). Further information pertaining to the various vegetation types is summaries in Table 14.

TABLE 14: VEGETATION TYPES IDENTIFIED WITHIN THE PROPOSED PROJECT AREA (EMS, MARCH 2015)

VEGETATION TYPE	DESCRIPTION
Mixed *Vachellia* Savannah	• Contains a tree layer which is mainly comprised of tall *Vachellia erioloba* (Camel Thorn) trees. • The smaller shrub layer consists of *Vachellia haematoxylon* (Grey Camel Thorn), *V. mellifara* (Black Thorn), *Ziziphus muconata*, and *Grewia flava* are prominent. • There are patches within this vegetation type that seemed to have a higher density of *Vachellia erioloba* (Camel Thorn) trees.
Senegalia mellifera Mixed	• Predominantly consists of the tree species *Senegalia mellifera* (Black thorn). • Characterised by a moderate to high shrub density with a poor to moderate grass coverage (40–60%) in some areas the *Senegalia mellifera* (Black thorn) forms dense thickets.
Vachellia haematoxylon Savannah	• Predominantly consists of the tree species *Vachellia haematoxylon* (Grey Camel Thorn). • The tree layer within this vegetation type is poorly developed with individuals of *Vachellia erioloba* (Camel Thorn) occurring within the community.
Tarchonanthus camphoratus Scrub	• Has a high percentage occurrence of *Tarchonanthus camphoratus* (Camphor bush). Although *Tarchonanthus camphoratus* (Camphor bush) is the dominant shrub, *Lycium hirsutum* (Kriedoring) and *Vachellia mellifera* (Black thorn) are also prominent within this community.
Riverine Vegetation	• Found within the Ga-Mogara non-perennial river. • This vegetation type has a high occurrence of *Vachellia erioloba* (Camel Thorn) trees but is also heavily invaded by *Prosopis grandulosa* (Honey mesquite).

Trees species located within the proposed project area that are protected in terms of the National Forests Act of 1998 (Act 84 of 1998) include the *Vachellia erioloba* (Camel Thorn), *Vachellia haematoxylon* (Grey Camel Thorn). The *Vachellia erioloba* (Camel Thorn) is also listed as declining in terms of the International Union for Conservation of Nature (IUCN). These species are present throughout the proposed project area although their density does vary across the site. The Mixed *Vachellia* Savannah type consists of the highest density of *Vachellia erioloba* (Camel Thorn). The density of the *Vachellia haematoxylon* (Grey Camel Thorn) is higher in the *Senegalia mellifera* woodland and the *Vachellia haematoxylon* Savannah vegetation types (EMS, March 2015).

Other species listed in terms of the Northern Cape Nature Conservation Act No. 9 of 2009 that are likely to occur within the proposed project area include *Harpagophytum procumbens* (Devils Claw), *Moraea longistyla,* (Goldblatt), *Moraea pallida* (Yellow Tulip), and *Babiana hypogaea* (Geelbobbejaantjie) (EMS, March 2015).

Alien and invasive species

Alien and invasive species located within the proposed project area are provided in Table 15 below.

TABLE 15: ALIEN AND INVASIVE SPECIES LOCATED WITHIN THE PROPOSED PROJECT AREA

SCIENTIFIC NAME	COMMON NAME	CATEGORY*
Argemone mexicana	Mexican Poppy	1
Argemone ochroleuca	White Flowered Mexican Poppy	1
Prosopis cf. *glandulosa*	Mesquite	2
Prosopis velutina	Mesquite	2
Datura stramonium	Thorn apple	1

*Conservation of Agricultural Resources Act

According to the Conservation of Agricultural Resources Act No 43 of 1983, Category 1 alien invasive species must be removed and destroyed immediately while those listed under Category 2 may be grown under controlled conditions.

Vegetation sensitivity

The proposed project area falls within the Griqualand West Centre of Endemism which is an area with a high concentration of plant species with very restricted distribution. Centres of endemism are important because it is these areas which if conserved would safeguard the greatest number of plant species.

In terms of the National Protected Areas Expansion Strategy, the proposed project area is not located in any focus areas but is located approximately 7km from an area identified as a potential protected area for the eastern Kalahari Bushveld.

In terms of the mining and biodiversity guideline the proposed project area does not fall into any biodiversity priority areas and is therefore not deemed a risk for mining.

The proposed project area is not considered a threatened ecosystem and does not fall within a National Freshwater Ecosystem Priority Area (NFEPA).

No Critical Biodiversity Areas (CBA's) were identified within the proposed project area in terms of the South African National Botanical Institute (SANBI) database. Aquifer Dependent Ecosystems (ADE) are located within the proposed project area and are possibly associated with *Vachellia Erioloba* and *Vachellia haemotoxylon* although information regarding ADE's is lacking in existing biodiversity databases. ADE's particularly in arid ecosystems provide habitats for an array of species and are

considered important in ecological processes and making resources available to biodiversity in the area that would otherwise not be available. Taking this into consideration ADEs could be considered CBAs although not specifically included on biodiversity databases (EMS, March 2015).

Areas considered to be of a high sensitivity include the areas that contain a high density of the protected trees. The mixed *Vachellia* Savannah and the *Vachellia haematoxylon* Savannah vegetation types and the area of the Ga-Mogara drainage channel are considered to have a high sensitivity. The *Senegalia mellifera* Mixed Woodland vegetation type is considered to have a low sensitivity as this area has been disturbed mostly through overgrazing. The *Tarchonanthus camphoratus* Scrub vegetation type is considered to be moderately sensitive as it contains fewer protected trees and the natural vegetation is in a moderate condition.

Fauna (Natural animal life)

Farming practises and mining activities surrounding the proposed project, have disturbed the local faunal population and as such very few faunal species were identified within the proposed project area. Bird species that were observed on-site include the Diederik Cuckoo, European Bea-Eater, White Throated Swallow, Red Faced Mousebird, Fork tailed Drongo, Ashy Tit, Redeyed Bulbul, and Clapper lark. Evidence of burrowing animals such as Suricate, White-tailed Mongoose and ground squirrels were observed within the proposed project site. Warthogs were also observed on-site by the SLR project team.

Species of conservation concern that are however likely to occur within the proposed project area are listed in Table 16 and Table 17 below.

TABLE 16: BIRD SPECIES OF CONSERVATION CONCERN LIKELY TO OCCUR WITHIN THE PROPOSED PROJECT AREA (EMS, MARCH 2015)

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS*
Martial Eagle	*Polemaetus bellicosus*	Vulnerable
Ludwig's Bustard	*Neotis ludwigii*	Vulnerable
Secretary bird	*Sagittarius serpentarius*	Near threatened
African Whitebacked Vulture	*Gyps africanus*	Vulnerable
Kori Bustard	*Ardeotis kori*	Vulnerable
Black stork	*Ciconia bigra*	Near threatened
Martial Eagle	*Polemaetus bellicosus*	Vulnerable
Lesser Kestrel	*Falco naumanni*	Vulnerable

* IUCN red list

TABLE 17: MAMMAL SPECIES OF CONSERVATION CONCERN POTENTIALLY AND/OR OCCURRING IN THE PROJECT AREA (EMS, MARCH 2015)

COMMON NAME	SCIENTIFIC NAME	CONSERVATION STATUS*
Dent's Horseshoe Bat	*Rhinolophus denti*	Near threatened
Honey badger	*Mellivora capensis*	Near threatened
Schreiber's long-fingered bat	*Miniopterus schreibersii*	Near threatened
South African Hedgehog	*Atelerix frontalis*	Near threatened

* IUCN red list

8.4.1.6 Surface water

INTRODUCTION

Surface water resources include drainage lines and paths of preferential flow of stormwater runoff. Project-related activities have the potential to alter the drainage of surface water through the establishment of infrastructure and/or result in the contamination of the surface water resources through seepage and/or spillage of potentially polluting materials, non-mineralised waste (general and hazardous) and mineralised wastes (overburden rock stockpiles). Key to understanding the hydrology of the site is the climatic conditions of the site (climate is discussed in section 8.4.1.3).

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.

DATA SOURCES

Information in this section was sourced from the surface water study being undertaken for the proposed project (SLR, February 2015).

RESULT/CONCLUSION

Regional hydrology

The proposed project area falls within the quaternary catchment D41K which has a gross total catchment area of 8000 km^2, with a net MAR of 1.92 million cubic meters (mcm).

The major river within quaternary catchments D41K and D41J is the Ga-Mogara drainage channel which flows through the proposed project area. The Ga-Mogara drainage channel forms a tributary of the Kuruman River. The Kuruman River flows west joining the Molopo River approximately 250 km from the confluence of the Ga-Mogara drainage channel and Kuruman River. The Molopo River drains in a southerly direction eventually joining the Orange River.

Local hydrology

The Ga-Mogara drainage channel is located on the eastern boundary of the proposed project site. No sub-surface flow is evident in the Ga-Mogara drainage channel. Further to this, it is understood by SLR from local farmers in the area that notable flows within Ga-Mogara drainage channel last occurred between 1974 and 1976 and again in 1988.

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 Ga-Mogara drainage channel, there is no third party reliance on surface water.

Wetlands

No wetlands are present within or immediately adjacent to the project area (EMS, March 2015).

8.4.1.7 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 8.4.1.1) provides a basis from which to understand the occurrence of groundwater resources. Project-related activities such as the development of the underground mining areas, the handling, storage and disposal of mineralised and non-mineralised wastes have the potential to impact on groundwater resources, both to the environment and third party users, through dewatering and pollution.

As a baseline, this section provides a brief description of the pre-mining groundwater conditions to facilitate an understanding of the potential for dewatering cones of depression and pollution plumes to occur as a result of project-related activities. More detailed information will be provided in the EIA and EMP.

DATA SOURCES

Information in this section was sourced from the SLR project team.

RESULTS/CONCLUSION

Presence of groundwater

Two distinct aquifers are present in the area: a shallow and a deep aquifer. These aquifers are described below:

Shallow Aquifer: A shallow unconfined to semi-unconfined aquifer is located at depths between 10 m and 50 m below the surface within material of the Kalahari formation. Water is held in the spaces between soil/sediment particles. The water may rest on an underlying clay-rich formation (perched water table). Groundwater flow within this aquifer is horizontal, however fractures within this aquifer may allow for vertical flow to the deeper aquifer. The shallow aquifer is characterised by a low hydraulic conductivity (1 to 10m/d)

Deep Aquifer: A deep confined fractured aquifer is located within the Dwyka, Mooidraai and Hotazel formations and is located at depths between 70 to 300 m below the surface. The groundwater flow within this aquifer is influenced by the fracture orientations. The deeper aquifer is characterised by a very low hydraulic conductivity (less than 1 m/d), except along well-developed fracture systems.

Based on the DWA Aquifer Classification map (Matoti et al 1999, recompiled 2012), the aquifers underlying the proposed project area are classified as a poor aquifer system. The yields in the deeper aquifer are generally considered low. The definition of a poor aquifer system is a low to negligible yielding aquifer system of moderate to poor water quality. Recharge of these aquifers is generally from rainfall at surface which infiltrates to lower levels and deeper aquifers. Recharge is estimated as 1% to 3% of mean annual rainfall. It is important to note, that there is a lack of connection between the shallow aquifer and the deep aquifer.

Groundwater flow

Groundwater flow directions in areas not impacted by mining will be along the surface topographical gradient. In terms of the proposed project, groundwater flows in an easterly direction towards the Ga-Mogara drainage channel.

Groundwater quality and levels

The average ground water level at the proposed project site ranges from 30m to 90m below ground level. Groundwater quality is generally poor due to high levels of mineralisation associated with dissolution of minerals in the Kalahari Sands. This will be confirmed during the EIA and EMP phase.

Groundwater use and yield

Groundwater use within the area is limited however where groundwater is utilised this is for domestic purposes and agricultural purposes such as livestock and game watering. Borehole yields are expected to be less than 0.3 L/s. This will be confirmed during the EIA and EMP phase.

8.4.1.8 Air quality

INTRODUCTION

A change in ambient air quality can result in a range of impacts, which in turn, may cause a disturbance to nearby receptors. As a baseline, this section provides a brief description of pre-mining conditions in

the area from which to measure changes as a result of the proposed project. More detailed information will be provided in the EIA and EMP.

DATA SOURCES

Information in this section was sourced from the air quality specialist study being conducted by Airshed Planning Professionals (April 2015) for the proposed project.

RESULTS/CONCLUSION

Existing emission sources

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

- Mining sources: Particulates represent the main pollutant of concern at mining operations, whether it is underground or opencast. The amount of dust emitted by these activities depends on the physical characteristics of the material, the way in which the material is handled and the weather conditions.
- Fugitive dust sources: Sources of fugitive dust identified in the proposed project area include, paved and unpaved roads; and wind erosion of sparsely vegetated surfaces.
- Unpaved and paved roads: Emissions from unpaved roads constitute a major source of emissions to the atmosphere in the South African context. Dust emissions from unpaved roads vary in relation to the vehicle traffic and the silt loading on the roads. Emission from paved roads are significantly less than those originating from unpaved roads, however they do contribute to the particulate load of the atmosphere. Particulate emissions occur whenever vehicles travel over a paved surface. The fugitive dust emissions are due to the re-suspension of loose material on the road surface.
- Wind erosion and open areas: Windblown dust generates from natural and anthropogenic sources.
- Vehicle tailpipe emissions: Emissions resulting from motor vehicles can be grouped into primary and secondary pollutants. While primary pollutants are emitted directly into the atmosphere, secondary pollutants form in the atmosphere as a result of chemical reactions. Significant primary pollutants emitted combustion engines include carbon dioxide (CO2), carbon (C), sulphur dioxide (SO2), oxides of nitrogen (mainly NO), particulates and lead. Secondary pollutants include NO2, photochemical oxidants such as ozone, sulphur acid, sulphates, nitric acid, and nitrate aerosols (particulate matter). Transport in the vicinity of the proposed project area is via trucks and private vehicles along the R380 (public) road, which are the main sources of vehicle tailpipe emissions.

Potential receptors

Potential receptors located surrounding the proposed project site includes the following:

- The Hotazel town situated approximately 4km south east from the boundary of the proposed project area
- The Black Rock mining community located approximately 8km north west from the boundary of the proposed project area

- The Gloria Mine village located approximately 1.3km north of the proposed project area
- The Black Rock mine village located approximately 5km north west of the proposed project area
- The Kalagadi Mine located approximately 700m to the south of the proposed project site
- Isolated farmstead located approximately 5.3 km south west from the boundary of the proposed project site
- Isolated farmstead located approximately 5 km north from the boundary of the proposed project site
- Isolated farmstead located approximately 5km west from the boundary of the proposed project area
- Isolated homestead located approximately 6.5km west from the boundary of the proposed project area
- Isolated farmstead located approximately 6.2 km north east from the boundary of the proposed project site

8.4.1.9 Noise

INTRODUCTION

Some of the noise generating activities associated with the project may cause an increase in ambient noise levels in and around the site. This may cause a disturbance to nearby potential receptors. As a baseline, this section provides a brief description of pre-mining conditions in the area from which to measure changes as a result of project-related noise. More detailed information will be provided in the EIA and EMP.

DATA SOURCE

Information in this section was sourced from the noise specialist study being conducted by Airshed Planning Professionals (April 2015) for the proposed project.

RESULTS/CONCLUSION

Ambient noise levels in the southern section of the proposed project area and areas to the south of the proposed project area correspond to what the South African National Standards 10103 (SANS) states is typically found in rural areas. In this regard noise levels range between 45 dBA during the day and 35 dBA at night. Ambient noise levels to the north of the proposed project site near the Gloria Mine correspond to what SANS states is typically found in suburban areas i.e. areas with some human activity. In this regard, typical noise levels range between 50 dBA during the day and 40 dBA at night. Existing ambient noise levels are affected by traffic along the R380 and surrounding mining activities.

Potential receptors surrounding the proposed project are outlined in Section 8.4.1.8 above.

8.4.1.10 Visual aspects

INTRODUCTION

Project-related activities have the potential to alter the landscape character of the site and surrounding area through the establishment of both temporary and permanent infrastructure. As a baseline, this

section provides an understanding of the pre-mining visual character of the project area against which to measure potential change as a result of project infrastructure and activities. More detailed information will be provided in the EIA and EMP.

DATA SOURCE

Information in this section was sourced through observations made during site visits and from specialist studies undertaken for similar neighbouring operations.

RESULTS/CONCLUSION

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 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; and
- Low – these include towns, communities, roads, railway line, industries and existing mines.

Although numerous mining related structures dominate the landscape to the north, south east and south of the proposed project area and the R380 and Telkom lines traverse the proposed project site, the overall scene is characterised by the Ga-Mogara drainage channel channel and open views of the bushveld. The result is a landscape with a moderate sense of place and a moderate scenic quality.

8.4.1.11 Heritage/cultural and palaeontological resources

INTRODUCTION

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

Paleontological resources are fossils, the remains or traces of prehistoric life preserved in the geological (rock stratigraphic) record. They range from the well-known and well 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 Gloria 266 (PGS, May 2013) and desktop palaeontological reviews conducted on the farm Gloria 266 (PGS, May 2013) and the farm Kipling 271 (Gideon Groenewald, July 2014).

RESULTS/CONCLUSION

Resources of historical importance are mostly restricted to relatively recent farming and mining activities. Stone Age arteficts also occur in the region (particularly near drainage lines) due to the historical presence of southern African hunter-gatherer communities typical of arid Northern Cape landscape.

Two stone age heritage sites have been identified on the remaining extent of the farm Gloria 266. Based on the findings of desktop palaeontological reviews (PGS, May 2013 and Gideon Groenewald, July 2014), 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.

8.4.1.12 Socio-economic

INTRODUCTION

The proposed project has 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 and disruption to the existing social structures within established communities;
- A change to not only pre-existing land uses, but also the associated social structure and meaning associated with these land uses and way of life.

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

DATA SOURCE

Information in this section was sourced from the Social and Labour Plan (MTS, January 2015). As part of the SLP, socio-economic profile data was sourced from the John Taolo Gaetsewe District Municipality (JTGDM) and the Joe Morolong Local Municipality (JMLM) Integrated Development Plans.

RESULTS/CONCLUSION

Population

The average population within the JTGDM is approximately 224 797 people while the average population within the JMLM is approximately 89 531.

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 73% within the JTGDM and 71% within the JMLM. Traditional dwellings (e.g. shacks) are the second highest used dwelling type with percentages ranging from 12% to 22% within the JTGDM and the JMLM respectively.

Basic services

Despite the relatively formalized housing infrastructure within both the JTGDM and the JMLM, basic services infrastructure appears to be far less formalized. In the JTGDM, only 26% of the population has access to flushing toilets, while the highest percentage (34%) of the population utilises pit toilets. In the JMLM, only 6% of the population have access to flushing toilets, while the highest percentage (40%) of the population within the JMLM, utilises pit toilets.

Approximately 4% of the JTGDM population has no access to potable water with 8% of the JMLM population having no access to potable water. Approximately 23% of the JTGDM population and 9% of the JMLM population have access to water inside dwellings. Approximately 18% of the JTGDM population and 7% of the JMLM population have access to water inside yards. Approximately 13% of the JTGDM population has access to potable water within a distance of 200 – 500m of dwellings with 18% of the JMLM population having access to potable water within a distance of 200 – 500m. Approximately 3% of the JTGDM population and 4% of the JMLM population have access to water further than 1000m from dwellings.

Approximately 26% of the JTGDM population and 6% of the JMLM population have access to refuse removal through municipalities or private companies, while approximately 7% of the JTGDM population

and 11% of the JMLM population have no access to refuse removal. Other forms of refuse removal include own refuse dumps and communal refuse dumps.

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 (9% of JTGDM and 13% of JMLM) or only limited primary education (35% of JTGDM and 42% of JMLM).

8.4.2 CURRENT LAND USES

INTRODUCTION

Mining activities have the potential to affect land uses both within the proposed project areas and in the surrounding areas. This can be caused by physical land transformation and through direct or secondary impacts.

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

DATA SOURCE

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

RESULTS/CONCLUSION

The discussion below should be considered with reference to Figure 6 and Figure 7.

Mineral/prospecting rights

Mokala currently holds a prospecting right (NC30/5/1/1/2/1250PR) over the remaining extent of the farm Gloria 266. Mokala is still undertaking prospecting related activities on the remaining extent of the farm Gloria 266.

Kalagadi Manganese (Pty) Ltd currently holds a mining right over the farm Umtu 281 and Assmang (Pty) Ltd currently holds a mining right over portion 1 of the farm Gloria 266. Kudumane Manganese (Pty) Ltd has applied for the mining right on the farm Kipling 271 and as such the mining right has not been granted yet.

Existing environmental authorisations in terms of NEMA

Assmang (Pty) Ltd currently holds an environmental authorisation (NC/EIA/JTG/ASS/HOT/2010 / NCP/EIA/0000030/2011) in terms of NEMA on the remaining extent of the farm Gloria and the farm

Kipling 271. Kudumane has submitted an application for environmental authorisation (NC/EIAl05/JTG/HOT/KUD/2013 / NCP/EIAl0000219/20I3) in terms of NEMA on the farm Kipling 271. This environmental authorisation is still pending.

Land owners within the proposed project area

Landowners located within the proposed project area are outlined in Table 18 below.

TABLE 18: LANDOWNERS LOCATED WITHIN THE PROPOSED PROJECT AREA

RELEVANT FARMS	RELEVANT PORTION	LANDOWNER
Gloria 266	Remaining extent	Ntsimbintle Mining Pty Ltd
	Portion 1	Assmang Pty Ltd
Kipling 271	Whole farm	Assmang Pty Ltd
Umtu 281	Whole farm	Kalagadi Manganese Pty Ltd

Mining companies

Mining companies with existing and/or proposed operations located within the proposed project area include:

- Assmang (Pty) Ltd (Gloria Mine) – Located on portion 1 of the farm Gloria 266
- Kalagadi Manganese (Pty) Ltd (Kalagadi Mine) – Located on the farm Umtu 281
- Kudumane Manganese (Pty) Ltd (Kudumane Mine) – Located on the farm Kipling 271

Mining companies surrounding the proposed project area include the following (Figure 6):

- United Manganese of Kalahari (Pty) Ltd (United Manganese of Kalahari Mine) – Located approximately 14km south east from the boundary of the proposed project area
- Tshipi é Ntle Manganese (Pty) Ltd (Tshipi Borwa Mine) – Located approximately 20km south southeast from the boundary of the proposed project area
- BHP Billiton (Mamatwan Mine) - Located approximately 20km south east from the boundary of the proposed project area
- Assmang (Pty) Ltd (Nchwaning Mine) – Located approximately 9km north west from the boundary of the proposed project area
- Assmang (Pty) Ltd (Black Rock Mine) – Located approximately 8.5km north west from the boundary of the proposed project area
- BHP Billiton (Wessels Mine) – Located approximately 8km north northwest 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 6):

- The old Hotazel Mine located approximately 4.5km south east from the boundary of the proposed project site

- The old Black Rock Mine located approximately 8km north west from the boundary of the proposed project site
- The old Devon Mine located approximately 8km south east from the boundary of the proposed project site
- The old York Mine located approximately 7km south south east from the boundary of the proposed project area
- The old Perth located approximately 12km south east from the boundary of the proposed project area
- The old Smartt Mine located approximately 14km south east from the boundary of the proposed project area
- The old Middelplaats Mine located approximately 19km south from the boundary of the proposed project area
- The old Adams Mine located approximately 24km south east from the boundary of the proposed project area

Livestock and game grazing

The far western section of the remaining extent of the farm Gloria 266 is currently utilised for game farming by Kalagadi Mine (Figure 7). This area has been fenced off from the rest of the remaining extent of the farm Gloria 266. The rest of the remaining extent of the farm Gloria 266 was utilised for cattle grazing in the past. The farm Kipling 271 is currently used for ad-hoc grazing.

Communities/towns and isolated farmsteads

With reference to Figure 6 the nearest residential areas include the following:

- The Hotazel town situated approximately 4km south east from the boundary of the proposed project area
- The Black Rock community located approximately 8km north west from the boundary of the proposed project area
- Gloria Mine village located approximately 1.3km north of the proposed project area
- Black Rock mine village located approximately 5km north west of the proposed project area
- Isolated farmstead located approximately 5.3 km south west from the boundary of the proposed project site
- Isolated farmstead located approximately 5 km north from the boundary of the proposed project site
- Isolated farmstead located approximately 5km west from the boundary of the proposed project area
- Isolated homestead located approximately 6.5km west from the boundary of the proposed project area
- Isolated farmstead located approximately 6.2 km north east from the boundary of the proposed project site
- The town Kuruman located approximately 57km to the south east from the boundary of the proposed project area

- The town Kathu located approximately 63km to the south from the boundary of the proposed project area

The Hotazel Town Planning Board is planning on extending the Hotazel residential area onto the farm Hotazel 280 which borders the proposed project area. The proposed Hotazel town expansion area is illustrated in Figure 6.

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

Regional powerline infrastructure

A regional powerline is located approximately 800m north east of the proposed project area (Figure 7).

Regional Telkom line infrastructure

A Telkom line currently runs parallel to the R380 and is not located within an existing servitude. As part of the proposed project, Mokala is proposing on diverting this Telkom line to follow the proposed R380 realignment route. Negotiations between Mokala and Telkom regarding the realignment of this Telkom line are underway.

Regional railway infrastructure

A railway line connecting Kathu, Hotazel and Black Rock runs along the east of the proposed project area and is located within an existing servitude (Figure 7).

Local Road Network

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

- The tarred R380 that traverses the proposed project site (refer to Figure 7)
- The tarred R31 that runs between Kuruman and Van Zylsrus is located approximately 4km south of the proposed project site (Figure 7).

Land claims

According to the Department of Rural Development and Land Reform: Regional Land Claim Commissioner; a land claim has been lodged on the farm Kipling 271 (Appendix E). The claimant is the Tsineng Communal Property Association.

No land claims have been lodged on the remaining extent and portion 1 of the farm Gloria 266 and the farm Umtu 281 (Appendix E).

Historical mine out areas

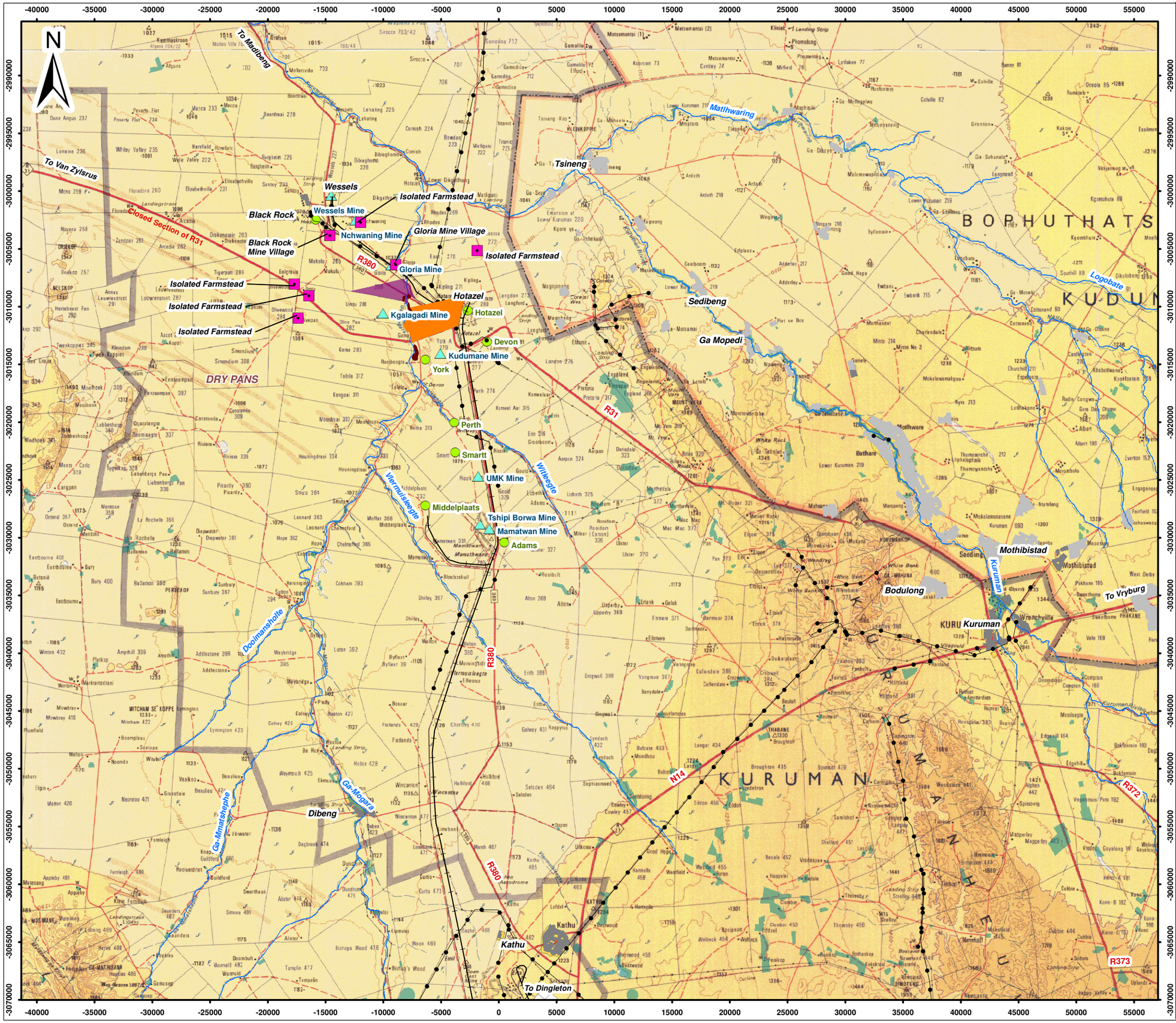
The south eastern section of the proposed project site has been influenced by historical borrow pit activities to remove calcrete in order to establish the R380 by the Department of Roads and Public Works.

8.4.3 DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE

The environmental features in the project area are described in Section 8.4.1 above, however the notable environmental feature is the Ga-Mogara drainage channel located on the eastern boundary of the proposed project area. Infrastructure within and close to the project area is discussed in Section 8.4.2 above. The notable infrastructure within the proposed project area is the R380 and Telkom line that traverses the proposed project site.

8.4.4 ENVIRONMENT AND CURRENT LAND USE MAP

A conceptual map showing topographical information as well as land uses on and immediately surrounding the proposed project area is provided in Figure 6 and Figure 7. This may be refined during the EIA and EMP Phase.



Legend

- Proposed Project Area
- Closed/Dormant Mines
- Operating Manganese Mines
- Potential Receptors
- New Hotazel Town Expansion Area
- High Urban Density
- Low Urban Density
- Cultivated Land
- Historical Borrow Pits
- Rivers
- Powerline
- Railway
- Roads

0 2 4 Kilometers

Scale: 1:150 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

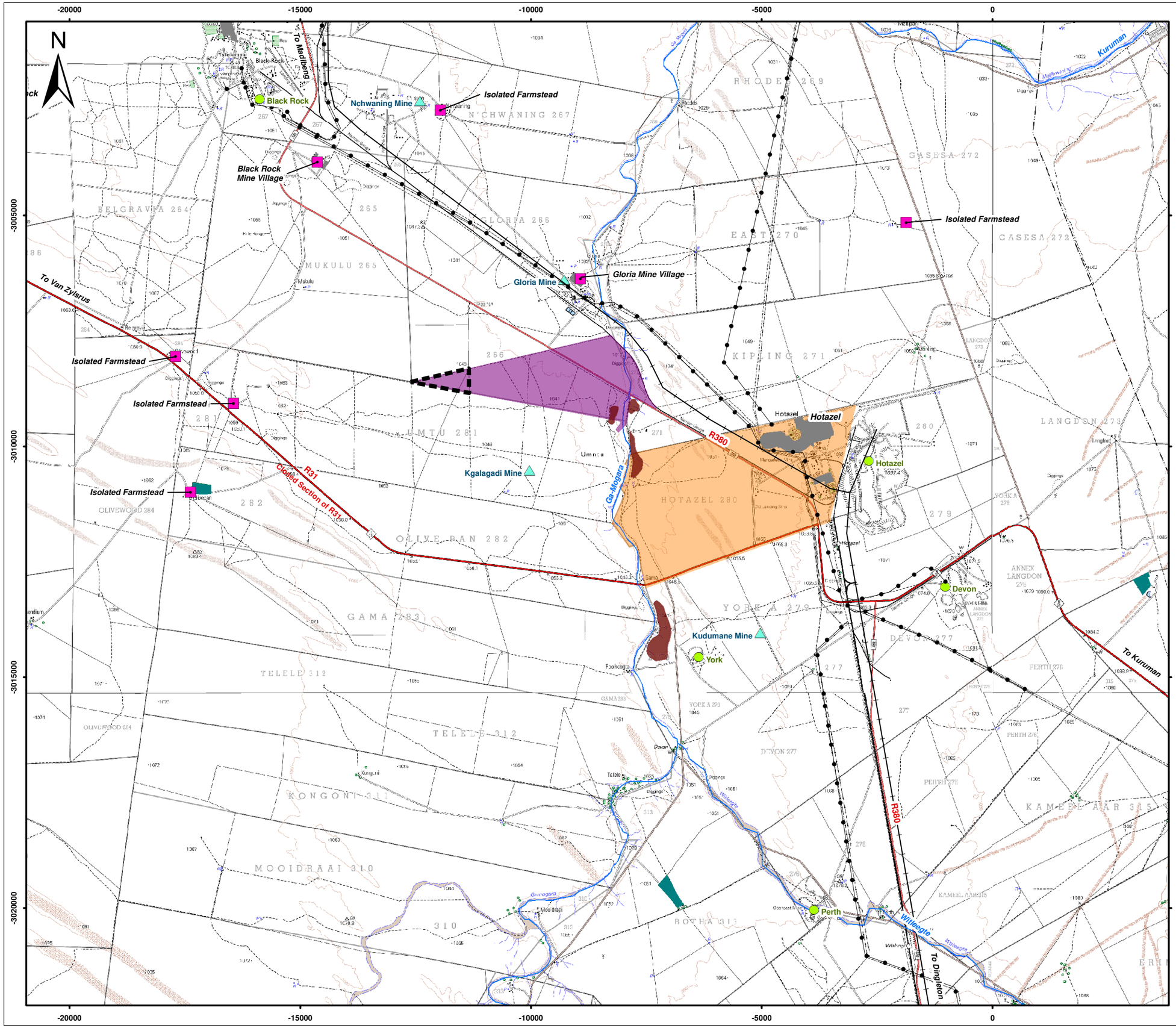
MOKALA MANGANESE (PTY) LTD

Figure 6

Regional Land Use Map

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

720.0912.00001 | April 2015



Legend

- Proposed Project Area
- Closed/Dormant Mines
- Operating Manganese Mines
- Potential Receptors
- High Urban Density
- New Hotazel Town Expansion Area
- Cultivated Land
- Historical Borrow Pits
- Area Fenced Off By Kalagadi for Game
- Rivers
- Powerlline
- Railway
- Roads

0 2 4 Km

Scale: 1:80 000 @ A3

Projection:Transverse Mercator
Datum: Hartebeeshoek, Lo 23

MOKALA MANGANESE (PTY) LTD

Figure 7

Local Land Use Map

SLR Consulting (Africa) (Pty) Ltd
P O Box 1596, Cramerview, 2060, South Africa
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720.0912.00001

April 2015

8.5 IMPACTS IDENTIFIED

This section provides a list of potential impacts on environmental and socio-economic aspects that have been identified in respect of each of the main project actions / activities and processes for each of the project phases (Table 3). A discussion of each of the impacts identified is provided in Section 8.7. 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.

TABLE 19: PRELIMINARY LIST OF POTENTIAL 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 a determination of residual impact will be provided. The final ratings will be included in the EIA and EMP report.

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Site preparation										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Earthworks										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Civil works										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Contamination of surface water resources			H	H	M	M	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction	H	H	M	H	H	Fully		
Pollution from emissions to air		Operation	H	H	M	H	H	Fully		
Noise pollution		Decommissioning	H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully	Possible	
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Open pit mining										
Loss and sterilization of mineral resources	1 and 2	Construction	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Hazardous excavations, surface subsidence and infrastructure that can be harmful to people and animals		Operation Decommissioning	H	H	M	H	H	Fully		
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction	H	H	M	H	H	Fully		
Reducing groundwater levels and availability (Pit dewatering and abstraction of water from boreholes)	N/A	Operation Decommissioning	H	M	M	M	H	Fully		
Reducing groundwater levels and availability (Pit dewatering)		Operation	H	M	M	M	H	Fully		
Pollution from emissions to air	1 and 2	Construction	H	H	M	H	H	Fully		
Increase in disturbing noise levels		Operation Decommissioning	H	H	M	H	M	Fully	Unlikely	
Blasting related impacts (Air blasts, ground vibration and fly rock)		Operational	H	H	H	M	H	Fully	Possible	
Negative visual impacts		Construction	M	H	M	L	M	Fully	Unlikely	
Loss of or damage to heritage/palaeontological resources		Operation Decommissioning	M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Processing plant										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure)			M	H	M	H	H	Fully		
Contamination of groundwater resources			H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Increase in disturbing noise levels			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Transport systems										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and			M	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
encroachment to Ga-Mogara)										
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Disturbance of roads by project related traffic			H	H	M	M	H	Fully	Possible	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially		Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Power supply and use										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Water supply and use										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Contamination of groundwater resources		Construction						Fully		
Lowering of groundwater levels (Only applicable if abstraction from boreholes takes place)	N/A	Operation Decommissioning	H	M	M	M	M	Fully		
Negative visual impacts	1 and 2		M	H	M	L	M	Fully	Unlikely	
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Mineralised waste										
Loss and sterilization of mineral resources	1 and 2	Construction	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Hazardous excavations and infrastructure that can be harmful to people and animals		Operation Decommissioning	H	H	M	H	H	Fully		
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction	H	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Pollution from emissions to air		Operation Decommissioning	H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Non-mineralised waste management (general and hazardous)										
Loss of soil resources and land capability through pollution	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Fully		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Partially		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to			M	H	L	M	M	Partially	Possible	Can be avoided

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
heritage/palaeontological resources										
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Support services										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		to acceptable levels
Change in land use			H	H	M	H	H	Fully		
General site management										
Loss of soil resources and land capability through pollution	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Alteration of natural drainage patterns (River realignment)		Construction	H	H	M	H	H	Fully		
Contamination of groundwater resources		Construction Operation Decommissioning	H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Negative visual impacts			M	H	M	L	M	Fully	Unlikely	
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Demolition										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction	H	H	M	H	H	Fully	Possible	Can be managed/mitigated

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Loss of soil resources and land capability through pollution		Operation Decommissioning	H	H	M	H	H	Fully		to acceptable levels
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Contamination of groundwater resources			H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Rehabilitation										
Hazardous excavations, surface subsidence and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss from containment infrastructure and encroachment to Ga-Mogara)			M	H	M	H	H	Fully		
Contamination of groundwater resources			H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Noise pollution			H	H	M	H	M	Fully	Unlikely	
Negative visual impacts			M	H	M	L	M	Fully		
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		
Maintenance and aftercare										
Hazardous excavations and infrastructure that can be harmful to people and animals	1 and 2	Construction Operation Decommissioning Closure	H	H	M	H	H	Fully	Possible	Can be managed/mitigated to acceptable levels
Loss of soil resources and land capability through pollution			H	H	M	H	H	Fully		
Loss of soil resources and land capability through physical disturbance			H	H	L	H	H	Fully		
Physical destruction of biodiversity			H	H	M	H	H	Partially		
General disturbance of biodiversity			M	H	M	H	H	Partially		
Contamination of surface water resources			H	H	M	M	H	Fully		
Alteration of natural drainage patterns (Loss			M	H	M	H	H	Fully		

POTENTIAL IMPACT	ALTERNATIVE	PROJECT PHASES	CONSEQUENCE			PROBABILITY	SIGNIFICANCE	DEGREE TO WHICH IMPACT		
			SEVERITY	DURATION	SPATIAL SCALE			CAN BE REVERSED	CAUSES IRREPLACEABLE LOSS OF RESOURCES	CAN BE AVOIDED/ MANAGED/ MITIGATED
from containment infrastructure and encroachment to Ga-Mogara)										
Contamination of groundwater resources			H	H	M	H	H	Fully		
Pollution from emissions to air			H	H	M	H	H	Fully		
Negative visual impacts			M	H	M	L	M	Fully	Unlikely	
Loss of or damage to heritage/palaeontological resources			M	H	L	M	M	Partially	Possible	Can be avoided
Positive socio – economic impacts (Economic impact)			H^+	H	H	H	H^+	Fully		Can be managed/mitigated to acceptable levels
Negative socio – economic impacts (Inward migration)			H	H	M	L	M	Fully		
Change in land use			H	H	M	H	H	Fully		

8.6 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 20: 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.**

8.7 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 8.4.1 of the scoping report.

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

With reference to Section 8.1, site layout alternatives, water supply and transportation alternatives are being considered as part of the proposed project. The assessment below provides a preliminary assessment of the alternatives. It is important to note that the site layout alternatives have been assessed for each environmental and socio-economic aspect. Water supply and transportation alternatives are however limited to groundwater and transportation aspects. It follows that water supply alternatives have only been assessed in section 8.7.6 and transportation alternatives have only been assessed in section 8.7.10.

8.7.1 GEOLOGY

ISSUE: LOSS AND STERILIZATION OF MINERAL RESOURCES

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

By the nature of mining projects the geology is exploited for the target minerals therefore the impact on the geology will be high in all project phases. It is also possible that mineral resources can become sterilised through the placement of surface infrastructure.

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

The additional work required to address this issue is outlined in section 9.3.1 of this scoping report.

8.7.2 TOPOGRAPHY

ISSUE: HAZARDOUS EXCAVATION, INFRASTRUCTURE AND SURFACE SUBSIDENCE

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. Included in this category is surface subsidence associated with mining areas. Hazardous excavations and infrastructure occur in all mine phases from construction through operation to decommissioning and closure.

The overall severity in the unmitigated scenario is expected to be high. This can reduce to low with the implementation of management measures focused on access control and the design of the open pit con-current rehabilitation components to prevent and/or mitigate impacts. In the event of injury to third parties or humans, the potential health impact could be long-term in nature. The spatial scale may extend beyond the project site to the communities to which the injured people or animals belong. The

significance of this impact is high without mitigation and could be reduced to low with mitigation. This assessment applies to both site layout alternatives.

The additional work required to address this issue is described in Section 9.3.2 of this scoping report.

8.7.3 SOILS AND LAND CAPABILITY

ISSUE: LOSS OF SOIL AND LAND CAPABILITY THROUGH POLLUTION

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Soil is a valuable resource that supports a variety of ecological functions. Mining projects in general have the potential to damage soil resources through contamination. A loss of soil resources would result in a decrease in the natural rehabilitation and future land use potential of any land. There are a number of sources in all phases that have the potential to pollute soil resources.

The overall severity in the unmitigated scenario is expected to be high and reduces to low in the mitigated scenario as the number of sources and number of pollution events should be significantly less. Most pollution impacts and associated loss in land capability will remain long after closure. In the mitigated scenario most of these potential impacts should either be avoided or be remedied immediately which reduces the duration to less than the mine life. The potential loss of soil resources and associated land capability will extend beyond the site boundary without mitigation. With mitigation, the potential loss of soil resources and associated land capabilities will be restricted to within the site boundary. The significance of this impact is high in the unmitigated scenario and can be reduced to low by the reduction in probability. This assessment applies to both site layout alternatives.

The additional work required to address this issue is described in Section 9.3.3 of this scoping report.

ISSUE: LOSS OF SOIL AND LAND CAPABILITY THROUGH PHYSICAL DESTRUCTION

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Soil is the key to re-establishing post closure land capability. Soil resources can be disturbed through removal, erosion and compaction which can result in a loss of soil functionality as an ecological driver. There are a number of activities/infrastructure in all phases that have the potential to disturb soils and related land capability.

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

The additional work required to address this issue is described in Section 9.3.3 of this scoping report.

8.7.4 BIODIVERSITY

ISSUE: PHYSICAL DESTRUCTION OF BIODIVERSITY

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The placement of mining infrastructure and activities in all phases has the potential to destroy biodiversity through the physical destruction of specific biodiversity areas, of linkages between biodiversity areas and related species which are considered to be significant because of their status, and/or the role that they play in the ecosystem.

The proposed project will require the removal of protected species such as the *Vachellia erioloba* (Camel Thorn), *Vachellia haematoxylon* (Grey Camel Thorn). In addition to this ADEs are associated with *Vachellia erioloba* and *Vachellia haemotoxylon* which provides habitats which are considered important in ecological processes and making resources available to biodiversity in the area that would otherwise not be available (Section 8.4.1.5).

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

The additional work required to address this issue is described in Section 9.3.5 of this scoping report.

ISSUE: GENERAL DISTURBANCE OF BIODIVERSITY

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

The placement of mining infrastructure and activities has the potential to directly disturb vegetation, vertebrates and invertebrates in all project phases.

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

The additional work required to address this issue is described in Section 9.3.5 of this scoping report.

8.7.5 SURFACE WATER

ISSUE: ALTERING DRAINAGE PATTERNS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Pre-mining natural drainage across the proposed project area is via sheet flow and/or preferential flow paths (drainage lines). The proposed open pit will be located within the 1:100 year floodline and within 100m from the Ga-Mogara drainage channel. Rainfall and surface water run-off will be collected in all areas that have been designed with water containment infrastructure as required by legislation. The collected run-off will therefore be lost to the catchment and can result in the alteration of drainage patterns. During the construction, operational and decommissioning phase, these activities will continue until such time as project infrastructure can be removed and/or the project areas are rehabilitated. During the closure phase rehabilitation will allow for the restoration of drainage patterns. In addition to this, the proposed project will require the realignment of the Ga-Mogara drainage channel. The proposed

realignment of the Ga-Mogara drainage channel will take place during the construction phase where after the design of the realignment will ensure that the volume of run-off to the downstream catchment will not be reduced when the river is in flow.

When considering the loss of run-off to the catchment as a result of containment infrastructure, the severity of the impact could be moderate in the unmitigated scenario and depends on the amount of run--off lost from the catchment. This can be reduced to low with mitigation measures. The realignment of the Ga-Mogara drainage channel has a high severity in the unmitigated scenario. This can be reduced to low with mitigation measures focussed on ensuring that the design of the river realignment does not restrict natural flow, when this occurs. Without mitigation, drainage patterns would continue to be impacted upon post-closure and this is a high duration. With mitigation however, run-off patterns should be re-established reducing the duration to medium. In terms of the river realignment this reduces to low with mitigation. In the mitigated and unmitigated scenario the physical alteration of drainage patterns will extend beyond the site boundary as flow reduction impacts could extend further downstream. The significance is high in the unmitigated scenario as the probability of the alteration of drainage patterns is definite without mitigation. With mitigation, the re-establishment of run-off patterns reduces the probability of this impact to low.

The placement of surface infrastructure for site layout option 1 will not encroach on the Ga-Mogara drainage channel. Surface infrastructure associated with site layout option 2 will be located within the 1:100 year floodline and within 100m from the Ga-Mogara drainage channel. It is however important to note that the assessment above still applies to both site layout alternatives given that with either option, run-off will be collected within containment infrastructure and the open pit will be still be located within the 1:100 year floodline and within 100m from the Ga-Mogara drainage channel.

The additional work required to address this issue is described in Section 9.3.6 of this scoping report.

ISSUE: CONTAMINATION OF SURFACE WATER RESOURCES

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

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

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

The additional work required to address this issue is described in Section 9.3.6 of this scoping report.

8.7.6 GROUNDWATER

ISSUE: REDUCING GROUNDWATER LEVELS AND AVAILABILITY

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

Groundwater levels could be reduced through the abstraction of groundwater from boreholes during the construction, operational and decommissioning phases. In addition to this, dewatering of the open pit could also reduce groundwater levels during the operational phase and will cease once the open pit has been mined out. If the abstraction of groundwater 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 will extend beyond the site boundary. In the unmitigated scenario the significance of this impact is high and can be reduced to low with mitigation.

The site layout alternatives are not applicable to this assessment. If the abstraction of groundwater from boreholes is not a viable option for Mokala, as discussed in Section 8.1.5, this activity will not be undertaken as part of the proposed project. If is however important to note that the anticipated impact will remain unchanged given that dewatering from the pit will still occur, however the duration of the impact will be limited to the operational phase.

The additional work required to address this issue is described in Section 9.3.7 of this scoping report.

ISSUE: CONTAMINATION OF GROUNDWATER RESOURCES

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Groundwater could become contaminated through the incorrect stockpiling of potentially polluting waste materials on the site during the construction and decommissioning of infrastructure. Possible sources of groundwater contamination during the operational phase include seepage from accidental spills and leaks, seepage from blasting residues and exposure of groundwater to exposed rock and seepage from the overburden rock and other stockpiles. During operation, decommissioning and closure there is also a potential for groundwater resources to be contaminated from backfilling the open pit with overburden rock. This is a high severity in the unmitigated scenario and can be reduced to medium with pollution prevention and/or mitigation measures. In the unmitigated scenario, groundwater contamination is long term in nature. With mitigation the impact can be limited to the life the proposed project. In both the unmitigated and mitigated scenario, groundwater pollution is likely to extend beyond the site boundary. The significance is high in the unmitigated scenario and can be reduced to medium/low with mitigation. This assessment applies to both site layout alternatives.

The additional work required to address this issue is described in Section 9.3.7 of this scoping report.

8.7.7 AIR QUALITY

ISSUE: POLLUTION FROM EMISSIONS TO AIR

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Mining projects present a number of air pollution sources that can have a negative impact on ambient air quality and surrounding land uses in all phases. Pollution sources include land clearing activities, materials handling, wind erosion from stockpiles, wind erosion of disturbed areas, vehicle movement along unpaved roads, dust generation from process plants and gas emissions mainly from vehicles and generators. The main contaminants include inhalable particulate matter less than 10 microns in size (PM_{10}), larger total suspended particulates (TSP) that relate to dust fallout and the manganese fraction of the $PM_{10.}$ This could have a negative impact on ambient air quality and could result in down-stream health impacts for nearby sensitive receptors if unmanaged. This is a high severity in the unmitigated scenario and can be reduced with measures to reduce emissions. Without mitigation the duration of the impacts could extend beyond closure. With mitigation, the duration of impacts will be limited to the phase prior to closure. The spatial scale of the potential impact extends off site in both the mitigated and unmitigated scenarios. The significance of this impact is high in the unmitigated scenario and can be reduced with mitigation. This assessment applies to both project alternatives.

The additional work required to address this issue is described in Section 9.3.8 of this scoping report.

8.7.8 NOISE

ISSUE: INCREASE IN DISTURBING NOISE LEVELS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

The project is associated with various noise generating activities in the construction, operational and decommissioning phases. An increase in ambient noise levels has the potential to disturb nearby sensitive receptors. The severity in the unmitigated scenario is expected to be medium and can be reduced to low with mitigation measures. In both the unmitigated and mitigated scenarios the noise pollution impacts will occur until the closure phase of the mine when the noise generating activities are stopped. This is a medium duration. In the unmitigated and mitigated scenarios the noise impacts will extend beyond the site boundary. The significance is medium in the unmitigated scenario and can be reduced to low with mitigation. This assessment applies to both project alternatives.

The additional work required to address this issue is described in Section 9.3.9 of this scoping report.

8.7.9 VISUAL ASPECTS

ISSUE: NEGATIVE VISUAL IMPACTS

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed project area is considered to have a moderate scenic quality (Section 8.4.1.10).

Visual impacts on this receiving environment may be caused by activities and infrastructure in all mine phases. The more significant visual impacts relate to the larger infrastructure components (such as the open pit mining, processing facilities and stockpiles). After closure the infrastructure should be removed and the site rehabilitated.

The severity in the unmitigated scenario is moderate when considered in the context of existing mining operations located to the north, south east and south of the proposed project area. The severity is unlikely to reduce with mitigation until the closure phase when the site has been rehabilitated (in the mitigated scenario). Without mitigation the duration will be long term however with mitigation the impacts are unlikely to extend post closure because the mine will have been rehabilitated. The spatial scale will extend beyond the mine boundary in both the unmitigated and mitigated scenario. The significance of this impact is medium in the unmitigated scenario. In the mitigated scenario the significance of the impact is

medium before closure and low after closure given that the proposed site will have been rehabilitated. This assessment applies to both infrastructure layout alternatives.

The additional work required to address this issue is described in Section 9.3.10 of this scoping report.

8.7.10 TRAFFIC

ISSUE: DISTURBANCE OF ROADS BY PROJECT RELATED TRAFFIC

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

Traffic impacts are expected from construction through to the end of the decommissioning phase when trucks, buses, and private vehicles make use of the public transport network surrounding the proposed project area. The key potential traffic related impacts are on road capacity and public safety when additional traffic is added to the existing transport network. In addition to this, the realignment of the R380 including the upgrade of the road access intersection as part of the proposed project can result in safety issues particularly if the design and implementation of the realignment and upgrade are not undertaken with appropriate safety protection measures. In the unmitigated scenario the severity is high. In the mitigated scenario the severity reduces to medium because the frequency of potential accidents is expected to reduce. Any serious injury or death is a long term impact in both the unmitigated and mitigated scenarios. The spatial scale is medium in both the unmitigated and mitigated scenario given that any injuries or fatalities will extend to the communities to which injured people/animals belong. The significance is high in the unmitigated scenario and can be reduced to medium with mitigation with a reduction in probability.

Site layout option 1 does not require the realignment of the R380, however the overall impact will remain unchanged for both site layout alternatives because even if the R380 is not diverted, this will not eliminate the potential for road related accidents. Similarly if it is determined that ore will primarily be transported via rail, the impact rating will remain unchanged given that private vehicles and busses will still make use of the existing public transport network.

The additional work required to address this issue is described in Section 9.3.13 of this scoping report.

8.7.11 BLASTING

ISSUE: BLASTING RELATED IMPACTS

Project phase/s in which impact could occur

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

Discussion

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

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

The additional work required to address this issue is described in Section 9.3.4 of this scoping report.

8.7.12 HERITAGE/CULTURAL AND PALEONTOLOGICAL RESOURCES

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

No palaeontological resources were found on site, however 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.

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure
			N/A

Discussion

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

localised to the site boundary in both the unmitigated and mitigated scenario. The significance of the impact is medium and can be reduced to low with mitigation with a reduction on probability. This assessment applies to both project alternatives.

The additional work required to address this issue is described in Section 9.3.11 and 9.3.12 of this scoping report.

8.7.13 SOCIO-ECONOMIC ISSUES

ISSUE: ECONOMIC IMPACT (POSITIVE SOCIO-ECONOMIC)

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

All activities associated with the proposed project will have positive socio-economic impacts in all phases. The proposed project has a positive economic impact on the local, regional and national economies. Direct benefits are derived from wages, taxes and profits. Indirect benefits through the procurement of goods and services, and the increased spending power of employees. The severity in both the unmitigated and mitigated scenario is a high positive. 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. This assessment applies to both project alternatives.

The additional work required to address this issue is described in 9.3.14 of this scoping report.

ISSUE: INWARD MIGRATION (NEGATIVE SOCIO-ECONOMIC)

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

The proposed project may have negative socio-economic impacts in all phases. The proposed project could have the following negative impacts:

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

- Possible reduced property values.

Taking the above into consideration the severity has been rated as high without mitigation. It may be possible to mitigate 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. This assessment applies to both project alternatives.

The additional work required to address this issue is described in 9.3.16 of this scoping report.

8.7.14 LAND USE

ISSUE: CHANGE IN LAND USE

Project phase/s in which impact could occur

Construction	Operational	Decommissioning	Closure

Discussion

Activities and infrastructure may have an impact on land uses within and surrounding the proposed project area in all phases.

Mokala currently undertakes prospecting related activities on the remaining extent of the farm Gloria 266. The remaining extent of the farm Gloria 266 is 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: mining, agriculture (Ad-hoc livestock grazing and game) and infrastructure (existing road networks and Telkom lines). In addition to this, a land claim has been lodged on the farm Kipling 271. The proposed project has the potential to affect these current land uses.

Land uses surrounding the proposed project area include: residential, mining and agriculture (Ad-hoc livestock grazing and game). In addition to this it is proposed that the Hotazel residential area will be expanded in the near future.

These land uses within and surrounding the proposed project area may be affected by one or more of the following environmental and social impacts:

- Hazardous infrastructure and excavations

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

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

The additional work required to address this issue is described in 9.3.16 of this scoping report.

8.8 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 21: POSSIBLE MITIGATION MEASURES AND ANTICIPATED LEVEL OF RESIDUAL RISK

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Open pit mining Mineralised waste	Loss and sterilization of mineral resources	• Incorporate cross discipline planning to avoid mineral sterilization. • Mine workings will be developed and designed so as not to limit the potential to exploit deeper minerals	Low
Earthworks Civil works Open pit mining Processing plant Transportation Mineralised waste Water supply and use Power supply and use Support services Demolition Rehabilitation Maintenance and aftercare	Hazardous excavations, surface subsidence and infrastructure	• Mine safety systems and DMR compliance • Access control, barriers and warning signs at hazardous areas • Operate the open pit in a manner to address stability related safety risks to third parties and animals • Monitoring and maintenance post closure to observe whether the relevant long-term safety objectives have been achieved and to identify the need for additional intervention where the objectives have not been met • Where Mokala has caused injury or death to third parties and/or animals, appropriate compensation will be provided. • In case of injury or death due to hazardous excavations, an emergency response procedure must be implemented.	Low
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Mineralised waste Non-mineralised waste Water supply and use Power supply and use Support services General site management Demolition Rehabilitation Maintenance and aftercare	Loss of soil resources through pollution	• Mine environmental management system and compliance • Basic infrastructure design that is adequate to contain polluting substances • Training of workers to prevent pollution • Equipment and vehicle maintenance • Fast and effective clean-up of spills • Effective waste management • In case of major spillage incidents an emergency response procedure must be implemented.	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Earthworks Open pit mining Processing plant Transport system Mineralised waste Non-mineralised waste Water supply and use Power supply and use Support services General site management Demolition Rehabilitation Maintenance and aftercare	Loss of soil resourced through physical destruction	• Limit site clearance to what is absolutely necessary • Develop and implement a soil management plan that addresses soil stripping, stockpiling and use for rehabilitation.	Low
Site preparation Earthworks Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Physical disturbance of biodiversity	• Limit site clearance to what is absolutely necessary • Preconstruction surveys of the development footprints for species suitable for search and rescue operations. • Avoid sensitive areas as far as practically possible • Collection of pods of *Vachellia erioloba* (Camel Thorn) and *Vachellia haematoxylon* (Grey Camel Thorn) should be collected in order to aid in the re-establishment of these species. • Obtain relevant permits prior to removal of protected tree species • A comprehensive monitoring programme of the protected trees within the area must be undertaken. This monitoring should be conducted on an individual tree basis as well as monitoring on a community level. • Implementation of an alien invasive species programme • Implementation of a biodiversity action plan to ensure that the undeveloped/mined areas within the property are properly conserved and maintained • Effective rehabilitation to as close to pre-mining conditions as practically possible.	Medium
Site preparation Earthworks	General disturbance of biodiversity	• Limit dust emissions and soiling of vegetation.	Medium

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare		• Training of employees on the value of biodiversity • Zero tolerance for harming and harvesting fauna and flora • Limit light and noise disturbance as far as practically possible • Effective waste management and pollution prevention • Effective rehabilitation to as close to pre-mining conditions as practically possible. • Prevention and combatting veld fires though establishment and maintaining of fire breaks and through the education of employees in order to comply with the National Veld and Forest Fire Act No. 101 of 1998.	
Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Contamination of surface water resources	• Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999): o Clean and dirty water system will be separate o Clean run-off will be diverted away from the site o Dirty water will be contained o The necessary exemptions and approvals will be obtained for activities and infrastructure located within 100m or within the 1:100 year floodline of the Ga-Mogara drainage channel. • Conduct surface water monitoring and implement remedial actions as required • Effective equipment and vehicle maintenance • Fast and effective clean-up of spills • Effective waste management • Education and training of workers • Effective rehabilitation of residue facility and the overall site.	Medium/Low
Earthworks Civil works Open pit mining Processing plant	Alteration of natural drainage patterns	• Obtain the necessary authorisations in terms of the NWA and exemptions in terms of Regulation 704 (4 June 1999) for activities and infrastructure located within 100m or within the 1:100 year floodline of the Ga-Mogara drainage channel	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare		• Develop and implement a stormwater management plan to minimise containment areas and divert clean water away from the site. • Effective rehabilitation to as close to pre-mining conditions as practically possible.	
Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Contamination of groundwater	• Mine infrastructure will be constructed and operated so as to comply with the National Water Act No. 36 of 1998 and Regulation 704 (4 June 1999) • Infrastructure that has the potential to pollute groundwater will be identified and included into a groundwater pollution management plan which will be implemented as part of the operational phase • Conduct groundwater monitoring and implement remedial actions as required. This includes compensation for mine related loss of third party water supply. • Effective equipment and vehicle maintenance • Fast and effective clean-up of spills • Effective waste management • Education and training of workers • Effective rehabilitation of residue facility and the overall site.	Medium/Low
Open pit mining Water supply and use	Reducing groundwater levels and availability	• Conduct groundwater monitoring and implement remedial actions where required. This includes compensation for mine related loss of third party water supply. • This monitoring programme should include third party boreholes.	Low
Site preparation Earthworks Civil works Open pit mining	Air pollution	• Limit disturbed areas • Supress dust effectively on unpaved roads and at material transfer points as required • Monitor pollutants of concern and implement additional mitigation	Medium

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Processing plant Transport system Power supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare		as required • Maintain vehicles and equipment in good working order. • Undertake a carbon footprint assessment.	
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Mineralised waste Non-mineralised waste Support services Demolition Rehabilitation	Noise pollution	• Maintain vehicles and equipment in good working order • Conduct noise monitoring in the unlikely event that Mokala receives noise related complaints. • Adhering to blasting schedule	Low
Open pit mining	Blasting impact	• Develop and implement a blast management plan which addresses blast design criteria to limit air blast, ground vibration and fly rock; pre-blast warning and evacuation and auditing of the blasts to check compliance to applicable requirements • Communication of scheduled blasts with IAPs • Remediation of all impacts caused by blasting. • In case of a person or animal being injured by blasting activities an emergency response procedure will be followed. • Limit blasting frequency and conduct blasting during daylight hours	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Visual impact	• Limit disturbed areas • Supress dust to prevent a visual dust cloud • Con-current rehabilitation • Effective waste management • Implement effective use of lighting which reduces light spill • Effective rehabilitation of the overall site	Medium and low at closure
Transport system	Road disturbance and traffic safety	• Construct safe access point • Educate employees (temporary and permanent) about road safety • Enforce strict vehicle speeds • If a person or animal is injured by transport activities an emergency response procedure must be implemented.	Medium
Site preparation Earthworks Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management	Loss of heritage/palaeontological resources	• Limit the area of disturbance as far as practically possible • Training of workers about the heritage and cultural sites that may be encountered and about the need to conserve these. • These resources are protected by the National Heritage Resources Act (No 25 of 1999) and may not be affected (demolished, altered, renovated, removed) without approval. In the event that resources are identified, a chance find emergency procedure should be implemented.	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Demolition Rehabilitation Maintenance and aftercare			
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Economic impact	• Employ local people and procure goods and services locally as far as practically possible • Ensure that closure planning considerations address the re-skilling of employees for the downscaling, early closure and long-term closure scenarios.	High positive
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation	Inward migration	• Effective communication with local communities to manage expectations with regard to employment and other opportunities • Worker training on health and safety related issues.	Low

ACTIVITY WHETHER LISTED OR NOT LISTED	POTENTIAL IMPACT	POSSIBLE MITIGATION	POTENTIAL FOR RESIDUAL RISK
Maintenance and aftercare			
Site preparation Earthworks Civil works Open pit mining Processing plant Transport system Power supply and use Water supply and use Mineralised waste Non-mineralised waste Support services General site management Demolition Rehabilitation Maintenance and aftercare	Land use	• Effectively manage noise, dust, surface and groundwater quality, blasting hazards, social impacts and visual impacts • Effective rehabilitation of the overall site for post closure land use.	Medium and low at closure

8.9 THE OUTCOME OF THE SITE SELECTION MATRIX

The position of the open pit is dictated by the ore body. With reference to Section 8.1.3, two plant layout alternatives were considered (refer to Figure 5). Option 1 included the location of the proposed plant to the south of the existing R380. Option 2 included the realignment of the R380 and the location of the proposed plant to the north and south of the current R380. Based on the outcome of the site selection matrix, the preferred site layout is option 2.

8.10 MOTIVATION WHERE NO ALTERNATIVE SITES WERE CONSIDERED

Not applicable.

8.11 STATEMENT MOTIVATING THE PREFERRED SITE

Refer to Section 8.9.

9 PLAN OF STUDY FOR THE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

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

During the EIA and EMP phase the alternatives that will be considered are as follows:

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

A description of these alternatives is provided in Section 8.1.

9.2 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 phase. The potential impacts are presented for each of the project phases in tabular format (Table 22).

TABLE 22: LIST OF POTENTIAL IMPACTS AS THEY RELATE TO PROJECT ACTIONS / ACTIVITIES / PROCESSES

MAIN ACTIVITY/PROCESS	PHASE	IMPACTS (UNMITIGATED)
Site preparation	Construction Operation Decommissioning	Hazardous excavations and infrastructure Physical destruction of biodiversity General disturbance of biodiversity Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Earthworks	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air

MAIN ACTIVITY/PROCESS	PHASE	IMPACTS (UNMITIGATED)
		Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Civil works	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Open pit mining	Construction Operation Decommissioning	Loss and sterilization of mineral resources Hazardous excavations, surface subsidence and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Reduction of groundwater levels and availability Pollution from emissions to air Noise pollution Blasting damage Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Processing plant	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Transport systems	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air

MAIN ACTIVITY/PROCESS	PHASE	IMPACTS (UNMITIGATED)
		Noise pollution Road disturbance and traffic safety Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Power supply and use	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Water supply and use	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Reduction of groundwater levels and availability Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Mineralised waste	Construction Operation Decommissioning	Loss and sterilization of mineral resources Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Non-mineralised waste management (general and hazardous)	Construction Operation Decommissioning	Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns

MAIN ACTIVITY/PROCESS	PHASE	IMPACTS (UNMITIGATED)
		Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Support services	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
General site management	Construction Operation Decommissioning	Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Demolition	Construction Operation Decommissioning	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use

MAIN ACTIVITY/PROCESS	PHASE	IMPACTS (UNMITIGATED)
Rehabilitation	Construction Operation Decommissioning	Hazardous excavations, surface subsidence and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Noise pollution negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use
Maintenance and aftercare	Construction Operation Decommissioning Closure	Hazardous excavations and infrastructure Loss of soil resources and land capability through pollution Loss of soil resources and land capability through physical disturbance Physical destruction of biodiversity General disturbance of biodiversity Contamination of surface water resources Alteration of natural drainage patterns Contamination of groundwater Pollution from emissions to air Negative visual impacts Loss of heritage/palaeontological resources Positive socio-economic impacts (Economic impact) Negative socio-economic impacts (Inward migration) Change in land use

9.3 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 phase.

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 where relevant, the specialist studies cater for requirements to support the water use license application and the waste management license application. The results of these studies will be collated into a combined EIA and EMP report.

9.3.1 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.

9.3.2 TOPOGRAPHY

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.

9.3.3 SOILS, LAND USE AND LAND CAPABILITY

It is proposed that a specialist soils and land capability investigation be undertaken by Terra Africa Environmental Consultants. The soils and land capability investigation will have the following objectives:

- The determination of the soil, land use and land capability baseline through a site survey including the analysis of soil samples.
- The identification of soil forms and the description of soil profiles of the surveyed proposed project area
- Description of the physical and chemical composition of the soil forms identified within the proposed project area
- Description of the land capability and current land use supported by the local soil conditions
- The assessment of possible impacts of the proposed project on soil, agricultural potential and land capability
- To have input, together with SLR, into project alternatives 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 specialist report will be provided in the EIA and EMP.

9.3.4 BLASTING

It is proposed that a specialist blasting investigation be undertaken by Cambrian CC. The blasting investigation will have the following objectives:

- Review of the conceptual blast plan
- Impact assessment related to proposed blasting activities.
- To have input, together with SLR, into project alternatives 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 specialist report will be provided in the EIA and EMP.

9.3.5 BIODIVERSITY (FLORA AND FAUNA)

It is proposed that the detailed (flora, fauna and aquatic system) investigation be conducted by Natalie Birch of Environmental Management Services (EMS). The investigation has the following objectives:

- Perform investigations to identify and map different habitats, concentrating on areas proposed for new infrastructure
- Assign species to each habitat through various trapping and sampling methods

- Rank each habitat type based on conservation importance (in terms of provincial biodiversity priorities) and ecological sensitivity
- Identify potential impacts (including cumulative) on ecology
- To have input, together with SLR, into project alternatives and ecology management measures going forward.

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

9.3.6 HYDROLOGY (SURFACE WATER)

It is proposed that a specialist hydrology assessment will be undertaken by SLR with input from AECOM. The hydrology study will have the following objectives:

- Baseline hydrology including average rainfall, average evaporation, storm intensities, review of watercourse network, flow data and mean annual runoff and peak flow estimation for Ga-Mogara drainage channel
- Floodline modelling
- Conceptual stormwater management plan.
- A conceptual wet and dry season water balance to inform the storm water inputs to the mine's water management system.
- Identify quantity and quality potential impacts (including cumulative) on surface water resources.
- To have input, together with the SLR EIA team, into project alternatives and surface water management measures going forward.

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

9.3.7 GROUNDWATER

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

- A hydrocensus to determine the baseline condition of groundwater quality and quantify within a 5km radius of the proposed project area
- Develop a conceptual model for the proposed site
- Model the dewatering impacts of the proposed project
- Geochemical analysis and waste assessment of the most significant potential pollution source(s)
- Model the potential pollution dispersion from the most significant potential pollution source(s)
- Assess the significance of dewatering and contamination impacts

- To have input, together with the SLR EIA team, into project alternatives 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 specialist report will be provided in the EIA and EMP.

9.3.8 AIR QUALITY

It is proposed that a specialist air quality impact assessment will be undertaken by Airshed Planning Professionals (Pty) Ltd. The study will have the following objectives:

- Analysis of meteorological, topographical and land-use data to determine atmospheric dispersion potential
- Establishing an air emissions inventory
- Identify potential third party receptor sites
- Assess the impact of air emissions on potential third party receptors using an air dispersion model
- To have input, together with SLR EIA team into project alternatives and air quality management measures going forward

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

9.3.9 NOISE

It is proposed that a specialist noise impact assessment will be undertaken by Airshed Planning Professionals (Pty) Ltd. The study will have the following objectives:

- The measurement and assessment of existing environmental noise levels within the vicinity of the proposed project area and at potential third party receptors.
- The identification of existing sources of environmental noise such as communities, mining, industries and public roads
- Predict the potential additional impact of project related noise sources
- To have input, together with SLR, into project alternatives and management measures going forward.
- Recommendations for the establishment of a noise monitoring programme

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

9.3.10 VISUAL ASPECTS

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.

9.3.11 HERITAGE/CULTURAL RESOURCES

It is proposed that no further specialist heritage investigation is required on the remaining extent of the farm Gloria 226 as this was undertaken in May 2013 (PGS, May 2013). The study included the following objectives:

- Identification and mapping (through literature review and field work) of archaeological, cultural and heritage resources on the farm Gloria 266
- Assessment of the significance of the identified resources
- Provide input, together with SLR and the technical project team into project alternatives and management measures going forward.

A copy of the heritage impact assessment report will be included in the EIA.

It is however proposed that a specialist heritage investigation be undertaken where infrastructure has been proposed on portion 1 of the farm Gloria, the farm Kipling 271 and the farm Umtu 281. The objectives of this investigation are listed above. A copy of this heritage impact assessment report will also be included in the EIA.

9.3.12 PALAEONTOLOGICAL RESOURCES

It is proposed that no further palaeontological specialist assessment will be undertaken on the farms Gloria 266 and Kipling 271 as this was undertaken in May 2013 (PGS, May 2013) and July 2014 (Gideon Groenewald, July 2014) respectively. The study included the following objectives:

- Identify and map (through literature review and field work) 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 project alternatives and management measures going forward.

A copy of this report will also be included in the EIA.

9.3.13 TRANSPORT SYSTEMS

It is proposed that a traffic impact investigation be undertaken by Siyazi Gauteng (Pty) Ltd. The study includes the following objectives:

- Determination of the baseline traffic conditions surrounding the proposed project area
- Calculate trip generation and distribution calculations
- To provide a basic geometric design input in terms of the proposed access intersection
- Assess the impacts of the proposed project on existing road capacity and safety
- Provide input, together with SLR and the technical project team into project alternatives management measures going forward.

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

9.3.14 ECONOMIC AND SUSTAINABILITY ANALYSIS

It is proposed that an economic and sustainability land use analysis will be undertaken by Mercury Financial Consultants (Pty) Ltd in order to meet the requirements of Regulation 50 of the MPRDA. This study has the following objectives:

- A preliminary analysis to identify and prioritise economic impact 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, of commercial, economic or as a result of the proposed mining activity
- Comparative assessment of the identified land use and development alternatives and their potential on the 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

9.3.15 CLOSURE COST ESTIMATE

It is proposed that a closure cost estimate by undertaken by SLR in accordance with Section 24P of NEMA.

9.3.16 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.

9.4 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 including project alternatives is provided in Section 8.6.

9.5 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 8.6.

9.6 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 if requested.

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

9.7.1 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. IAPs will similarly be invited to attend a public feedback meeting during the EIA phase (if required).

9.7.2 DETAILS OF THE ENGAGEMENT PROCESS TO BE FOLLOWED

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

- Public and/or stakeholder meeting/s to give feedback on the findings of the EIA (if required)
- Circulation of the EIA and EMP report for public review. This report will include any issues and concerns raised by IAPs and regulatory authorities
- Notification of IAPs on the database on the relevant DMR decisions.

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

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

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

9.8 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 23 below.

TABLE 23: EIA AND EMP ACTIVITIES AND TIMING

OBJECTIVES	CORRESPONDING ACTIVITIES AND ESTIMATED DATES
Further investigations (October 2014 to September 2015)	
• Describe the affected environment • Define potential impacts • Give management and monitoring recommendations	• Investigations by technical project team and SLR of issues identified during the scoping stage including investigations into alternatives.
EIA and EMP phase (September 2015 to April 2016)	
• Assessment of potential environmental impacts • Design requirements and management and mitigation measures • Receive feedback on application	• Compilation of the EIA and EMP report (September to October 2015) • Distribute the EIA and EMP report to IAPs, DMR and other regulatory authorities for review (October 2015). • Public feedback meetings with IAPs (if required) (November 2015). • Record comments (November 2015). • Submit final report to DMR for decision making (January 2016) • Circulate record of decision to all registered IAPs (April 2016).

9.9 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 21 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.

9.10 OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No additional requests for information have been received to date.

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

The potential socio-economic impacts are discussed in section 8.7 and will be investigated further during the EIA Phase as outlined in Section 9.

9.10.2 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 phase of the proposed project.

10 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.

11 UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I, Natasha Daly, 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: 08/07/2015

12 UNDERTAKING REGARDING LEVEL OF AGREEMENT

I, Natasha Daly, 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: 08/07/2015

13 REFERENCES

Airshed Planning Professionals (Pty) Ltd, Air Quality Specialist Report for the Proposed Mokala Manganese Project in the Northern Cape Province, April 2015.

Ecological Management Services, Biodiversity Survey Report for the proposed Mokala manganese mine layout, March 2015.

Joe Morolong Spatial Development Framework, September 2012.

Management Transformation Solutions (Pty) Ltd, Social and Labour Plan for the Mokala Manganese Mine, January 2015.

SLR Consulting (Africa) (Pty) Ltd, Mokala surface water study, February 2015.

Siyazi, Traffic Impact Assessment for the Proposed Mokala Manganese Mine to be located near Hotazel (Road R380) in the Northern Cape.

Terra Africa Environmental Consultants, Mokala Manganese Project Soil, Land Use and Land Capability Report, February 2015.

APPENDIX A: PROOF OF EAP REGISTRATION

APPENDIX B: CURRICULUM VITAE

APPENDIX C: LOCAL AND REGIONAL SETTING

APPENDIX D: SITE PLAN

APPENDIX E: INFORMATION SHARING WITH IAPS AND REGULATORY AUTHORITIES

- NEMA/NEMWA application form
- Database
- Background information document in English and Afrikaans
- Site notices in English and Afrikaans 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 public meeting
- Formal invitations sent to Regulatory authorities to notify them of the authorities meeting
- Minutes of the public meeting including the attendance register
- Minutes of the regulatory authorities meeting including the attendance register
- Correspondence from the land claims commissioner

RECORD OF REPORT DISTRIBUTION

Project Number:	710.09012.00001
Title:	Scoping report for the development of the proposed Mokala Manganese Mine
Report Number:	1
Proponent:	Mokala Manganese (Pty) Ltd

Name	Entity	Copy No.	Date issued	Issuer
Raisebe Sekepane	Department of Mineral Resources			
Moses Ramakulukusha	Department of Environment and Nature Conservation			
Esther Makungo	Department of Water and Sanitation			
Philip Hine	South African Heritage Resource Agency			
Viljoen Mothibi	Department of Agriculture and Land Affairs			
Jacoline Mans	Department of Agriculture, Forestry and Fisheries			
Ryan Oliver	The Northern Cape Department of Rural Development and Land Reform			
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