Project Reference: 710.12015.00011

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03 November 2020

Mn48 (Pty) Ltd

BASIC ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT FOR THE CONSOLIDATION OF THE MN48 MINING RIGHT AREA AND KHWARA MINING RIGHT APPLICATION AREA, INCLUDING THE ASSOCIATED ENVIRONMENTAL MANAGEMENT PROGRAMMES AND CHANGES TO APPROVED SURFACE INFRASTRUCTURE LAYOUT (MN48 PROJECT)

BASIC ASSESSMENT REPORT AVAILABLE FOR PUBLIC REVIEW

DMRE REFERENCE NUMBER: NC 00183 MR 102

Dear Sir/Madam

INTRODUCTION

Mn 48 (Pty) Ltd (Mn48) (previously known as Lehating Mining (Pty) Ltd (Lehating)) is planning to develop its new underground manganese mining operation located on Portion 1 of the farm Lehating 741, near the town of Black Rock in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality, Northern Cape Province, South Africa.

The approved Mn48 mining operation comprises an underground mining area accessed via a shaft, a processing plant, waste rock dump (WRD), tailings storage facility (TSF) and support services and infrastructure. No surface infrastructure has been established to date. Initial site preparation has however been undertaken for the development of the access road, erection of fencing and establishment of the Eskom substation, access shaft and ventilation shaft.

Immediately adjacent and to the south of the Mn48 Mining right area, Khwara Manganese (Pty) Ltd (Khwara) holds an Environmental Authorisation (EA) for the underground mining of manganese on Portion 2 of the farm Wessels 227 and the Remaining Extent and Portions 3 and 4 of the farm Dibiaghomo 226. The intention at the time of the application was for the Khwara underground resource to be accessed and mined using Mn48's approved surface infrastructure and as such no surface infrastructure would be established on the relevant portions of the farms Wessels and Dibiaghomo.

Mn48 is proposing to consolidate the Mn48 Mining Right area (and related operations) and the adjacent Khwara Mining Right Application Area (and related underground mining) to support a single contiguous mining operation. In support of this the approved layout of surface infrastructure located on a Portion 1 of the farm Lehating 741 has been optimised based on the outcomes of the Bankable Feasibility Study (BFS). In summary, the changes to the approved operations and surface infrastructure include the following:

- Relocation of the primary crushing facilities from underground to surface;
- Extension of the footprint and capacity of the approved WRD;
- Addition of a second PCD, and relocation of the already approved PCD (note that the previously proposed emergency control dam will no longer be required);
- General re-configuration of approved surface infrastructure;
- Revision of the stormwater management plan to accommodate the changes to the surface infrastructure layout; and
- Establishment of proposed new support infrastructure such as a helicopter pad and weighbridge.

In addition to the above, the approved EMPr for Mn48 specified the need for a TSF. This will no longer be required. The project has made a fundamental change to the mineral processing methodology whereby a dry screening process will be used, instead of a wet screening process which would produce tailings.

REVIEW OF BAR

SLR Consulting (South Africa) (Pty) Ltd (SLR), an independent firm of environmental assessment practitioners (EAP), has been appointed by Mn48 to manage the environmental authorisation processes. In this regard the Basic Assessment Report (BAR) for the proposed project is now available for public and commenting authority review for a period of 30 days (**04 November 2020 until 03 December 2020**).

This document presents a summary of the findings for the BAR undertaken for the proposed project. In this regard the executive summary of the BAR has been extracted from the BAR and is included in Appendix A of this document. It is important to note, that to date no comments and concerns have been raised by Interested and Affected Parties (I&APs).

Electronic copies of the full report are available on:

- The SLR website(at https://slrconsulting.com/public-documents); and
- The SLR data free website (http://slrpublicdocs.datafree.co/publicdocuments).

Electronic copies (compact disk) of the report are available on request from SLR, at the contact details provided below.

SLR Consulting (South Africa) (Pty) Ltd

Attention: Natasha Smyth or Gugu Dhlamini

PO Box 1596, Cramerview 2060 (if using post please call SLR to notify us of your submission)

Tel: (011) 467 0945

E-mail: nsmyth@slrconsulting.com/ gdhlamini@slrconsulting.com

All comments received during the review process will be included and addressed in the final BAR which will be made available to the Department of Mineral Resources and Energy (DMRE) for decision making purposes.

If you have any questions, please contact the undersigned.

Kind regards

Natasha

Appendix A: EXECUTIVE SUMMARY OF THE BAR FOR THE PROPOSED PROJECT

PROJECT BACKGROUND

Mn 48 (previously known as Lehating) is planning to develop its new underground manganese mining operation located on Portion 1 of the farm Lehating 741, near the town of Black Rock in the Joe Morolong Local Municipality and the John Taolo Gaetsewe District Municipality, Northern Cape Province, South Africa. Mn48 holds:

- A mining right (MR) and environment management programme report (EMPr) issued and approved by the Department of Mineral Resources (DMR) (currently known as the DMRE) (DMR Ref: NC/30/5/1/2/2/10028 MR) in July 2015 in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA), as amended; and
- An environmental authorisation (EA), issued by the Department of Environment and Nature Conservation (DENC) (DENC Ref: NC/EIA/JTG/JOEL/LEH2/2012) in September 2014 in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA), as amended.

The approved Mn48 mining operation comprises an underground mining area accessed via a shaft, a processing plant, WRD, TSF and support services and infrastructure. No surface infrastructure has been established to date. Initial site preparation has however been undertaken for the development of the access road, erection of fencing and establishment of the Eskom substation, access shaft and ventilation shaft.

Immediately adjacent and to the south of the Mn48 Mining right area, Khwara holds an EA for the underground mining of manganese on Portion 2 of the farm Wessels 227 and the Remaining Extent and Portions 3 and 4 of the farm Dibiaghomo 226. The EA was issued by the DMR (currently the DMRE) in November 2018 (DMR Ref: NC30/5/1/2/2/10122 MR). The intention at the time of the application was for the Khwara underground resource to be accessed and mined using Mn48's approved surface infrastructure and as such no surface infrastructure would be established on the relevant portions of the farms Wessels and Dibiaghomo.

Mn48 is proposing to consolidate the Mn48 Mining Right area (and related operations) and the adjacent Khwara Mining Right Application Area (and related underground mining) to support a single contiguous mining operation. In support of this the approved layout of surface infrastructure located on a Portion 1 of the farm Lehating 741 has been optimised based on the outcomes of the Bankable Feasibility Study (BFS). In summary, the changes to the approved operations and surface infrastructure include the following:

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The planned consolidation area (i.e. combined Mn48 Mining Right area and Khwara Mining Right Application area) is hereafter referred to as the "project area". The regional and local setting of the project area is illustrated in Figure 1 and Figure 2 respectively.

SUMMARY OF AUTHORISATION REQUIREMENTS

Prior to the commencement of the project, the following is required:

- An amended MR and approved EMPr from the DMRE in terms of Section 102 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA), as amended;
- An EA from the DMRE in terms of the NEMA, as amended. The Environmental Impact Assessment (EIA) Regulations being followed are Government Notice Regulation (GNR) 982 of 4 December 2014 (GNR. 982), as amended;
- A Waste Management Licence (WML) from the DMRE in terms of the National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA), as amended.; and
- An Integrated Water Use License (IWUL) from the Department of Human Settlement, Water and Sanitation (DHSWS) in terms of Section 21 of the National Water Act (NWA) (No. 36 of 1998), as amended.

IMPACTS AND MANAGEMENT ACTIONS

This section provides a summary of the assessment of the potential impacts of the project and provides measures to prevent and/or mitigate the impacts. The potential impacts associated with the proposed project can be categorised into those that have low, medium and/or high significance in the unmitigated scenario. All three categories of impacts require a measure of management actions which, if successfully implemented will reduce and or enhance the significance of the impacts. Cumulative impacts and latent impacts are also summarised in the table below. **For the purpose of this project, the effect of the proposed project on the impact ratings of the approved Lehating and Khwara projects were considered.**

The table below provides a summary of the potential impacts in no particular order of importance.

Table A: POTENTIAL IMPACT SUMMARY

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
Geology (mineral resources)	Loss and sterilisation of mineral resources	Mineral resources can be sterilized and/or lost through the placement of infrastructure and activities in close proximity thereto, by preventing access to potential mining areas, and through the disposal of mineral resources onto mineralised waste facilities. This impact was assessed in the approved Lehating EMPr as having a moderate significance in the unmitigated scenario, and low significance in the mitigated scenario. However, the ore body is located 200 m or more below the surface on both Lehating 741 and Wessels 227. It therefore follows that placement of surface infrastructure is in any event unlikely to prevent the mining of the mineralised ore body nor require the need for mitigation. Moreover, the WRD will be easily accessible for future reclamation or reprocessing if required. This impact was assessed as being insignificant in the approved Khwara EMPr. These factors remain valid for the project.	Insignificant	
Topography	Risk of surface subsidence	Underground mining activities could result in surface subsidence during the operational phase. During the decommissioning phase the mine void must be made safe and access to third parties prevented. The risk of subsidence was determined to be insignificant due to the following factors: • Mining will be 250 metres below surface, and therefore there is no significant risk of subsidence; and • The mine design incorporates support structures as per industry best practice. These factors remain valid for the project.	Insignificant	
	Safety to third party and animals	Hazardous excavations and infrastructure include all structures into or off which third parties and animals can fall and be harmed. This assessment remains valid for the project. Related management actions focus on appropriate design of facilities that can fail, access control, appropriate compensation and closure planning.	High	Medium

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
Soil and land capability	Loss of soil resources and land capability through contamination	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. Contamination of soils also has the potential to impact biodiversity, surface and groundwater resources. The loss of soil resources has a direct impact on the potential loss of the natural capability of the land. The approved infrastructure and activities present numerous sources of soil pollutants that can result in a loss of soils (and associated land capability) as a resource. This in turn can result in a loss of soils as an ecological driver because it can create a toxic environment for vegetation and ecosystems that rely on the soil. The proposed changes in the surface infrastructure and activities will not materially change this. This remains valid for the project. Management actions focus on pollution prevention and conservation and closure planning.	High	Medium-Low
	Loss of soil resources and land capability through physical disturbance	Soil is a valuable resource that supports a variety of ecological functions. Soil is the key to re-establishing post closure land capability. There are a number of activities/infrastructure in all phases that have the potential to disturb soils and related land capability through removal, compaction and/or erosion. The loss of soil resources has a direct impact on the potential loss of the natural capability of the land. In the unmitigated scenario, physical soil disturbance can result in a loss of soil functionality as an ecological driver. In the case of erosion, the soils will be lost to the area of disturbance, and in the case of compaction the soils functionality will firstly be compromised through a lack of rooting ability and aeration, and secondly the compacted soils are likely to erode because with less inherent functionality there will be little chance for the establishment of vegetation and other matter that naturally protects the soils from erosion. Any soils that remain beneath the permanent landforms (WRD) will be a lost resource and the associated land capability will be permanently altered. The proposed changes in the surface infrastructure and activities will marginally increase the footprint of the mine. Management actions focus on limiting the disturbance footprint, implementing soil management principles and closure planning.	High	Low
Biodiversity	Physical destruction of terrestrial biodiversity	There are a number of activities/infrastructure in all phases that have the potential to destroy biodiversity in the broadest sense. The activities and infrastructure have mostly been positioned in low and moderately sensitive biodiversity areas, with the exception of the road corridor that traverses the Kuruman River. Despite the attempt to avoid more sensitive areas, the project will require the clearing of vegetation and associated habitat in the infrastructure footprint area. This	High	Medium

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
		will cause vegetation fragmentation and habitat disturbance which although limited to a relatively small footprint on site, is part of a growing cumulative impact in the region. The proposed changes in the surface infrastructure and activities will marginally increase the footprint of the mine. Management actions focus on limiting the mine footprint area, monitoring, obtaining flora and fauna permits and closure planning.		
	General disturbance of terrestrial biodiversity	There are a number of activities/infrastructure that have the potential to directly disturb fauna and flora in all project phases. The proposed changes in the surface infrastructure and activities will not materially change this. Management actions focus on speed control, appropriate lighting, employee education, dust control, litter prevention, noise attenuation measures and monitoring.	High	Medium
	Loss and general disturbance of aquatic biodiversity	There are a number of activities/infrastructure that have the potential to directly disturb aquatic biodiversity in all project phases. The river crossing has already been approved, however for completeness purposes, the potential impact on the Kuruman River include: • Loss of habitat and ecological structure • Changes to the river service provision • Impacts on hydrology and sediment balance Management actions focus on limiting the disturbance areas and protecting the sensitive Kuruman River Riparian zones and monitoring.	High	Medium (all phases prior to closure) Low (at closure)
	Impact on terrestrial ecosystems due to dewatering	The project has the potential to indirectly disturb vegetation, vertebrates and invertebrates during the operation, decommissioning and closure phases. This is because some ecosystems require groundwater from aquifers for all or part of their life-cycle. These Aquifer Dependent Ecosystems (ADEs) occur throughout the South African landscape in areas where aquifer flows and discharge influence ecological patterns and processes. ADEs provide habitats for an array of species, especially in arid areas, and are considered important in ecological processes and making available resources for the biodiversity in an area that would otherwise not be available. Dewatering activities during the operational phase could therefore impact on ADEs by reducing the availability of shallow groundwater. Management actions focus on monitoring.	Insignificant	
	Alteration of sub-surface flow	The project includes underground mining beneath the Kuruman River. Mining depth will be in excess of 200 m below surface. In the event that underlying aquifers contribute towards sub-surface flow, a lowering of groundwater levels from dewatering may alter the existing sub-surface	Insignificant	

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
	affecting aquatic ecosystems	flow of the Kuruman River, and its associated wetland system. This impact has been assessed to be insignificant because the groundwater study has concluded that the river is not expected to be in hydraulic continuity.		
Surface	Alternation of natural drainage patter	Pre-mining natural drainage across the site is via sheet flow and/or non-perennial preferential flow paths (drainage lines). There are a number of activities/infrastructures which will alter drainage patterns either by reducing the volume of run-off into the downstream catchments or through their location within watercourses. This in turn has the potential to cause water supply impacts on downstream human and biodiversity users. During the construction, operation, decommissioning, and to a lesser extent, the closure phases, rainfall and surface water run-off will be collected in all areas that have been designed with water containment infrastructure. The collected run-off will therefore be lost to the catchment and can result in the alteration of drainage patterns. In terms of drainage lines, the project will affect the non-perennial Kuruman River located to the south west of the Lehating farm, through the creation of a river crossing associated with the construction of an access road. Related management actions focus on stormwater management, appropriate design of the river crossing and removal of the river crossing at closure.	High	Low
	Contamination of surface water resources	There are a number of pollution sources in all phases that have the potential to pollute surface water, particularly in the unmitigated scenario. At elevated pollution concentrations these contaminants can exceed the relevant limits imposed by DHSWS (these limits may be subject to periodic revision in consultation with DHSWS) and can be harmful to humans and livestock if ingested directly and possibly even indirectly through contaminated vegetation, vertebrates and invertebrates. Due to the proximity of the Kuruman River, contaminants are likely to reach surface water resources, particularly in the unmitigated scenario. There is limited third party reliance on surface water resources (groundwater is used) and no surface water users were identified in the footprint area of the mine. Areas surrounding the project site are utilised for grazing activities and as such it is possible that cattle will utilise the tributaries of the Kuruman River for drinking purposes, however this is unlikely due to the ephemeral nature of the river. Related management actions focus on clean and dirty water separation systems, limiting infrastructure and activities within the floodline, pollution prevention and monitoring.	High	Low

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
Groundwater	Contamination of groundwater resources	There are a number of sources in all mine phases that have the potential to pollute groundwater. Some sources are permanent and some sources are transient (starting later and at different time-steps) and becoming permanent. Even though some sources are temporary in nature, related potential pollution can be long term. Groundwater contamination sources include accidental spills and leaks from vehicles, non-mineralised waste, equipment, workshops and washbays which have the potential to reach shallow groundwater. In addition to this, the waste rock stockpile and other stockpiles which have the potential to impact upon groundwater through seepage. The relocation of surface infrastructure and design changes will not present significantly different contaminants or source types to those previously assessed for all project phases. However, the establishment of additional facilities and the extension of the footprint of already approved facilities will contribute additional pollution sources during the operational, closure and post-closure phases. This relates to the extension of the footprint of the approved WRD and the addition of a second PCD. The change in the mineral process to that of a dry screening process means that a pollutant source (TSF) will no longer be established on site. Related management actions focus on pollution prevention, design, monitoring and alternative water supply (if necessary).	High-Medium	Low
	Reduction of groundwater levels and availability	Mine dewatering to ensure safe working conditions and/or the abstraction of water from the approved water supply boreholes (well field) has the potential to cause a reduction in the level and availability of groundwater, which may cause a loss in water supply to surrounding borehole users and impact the baseflow of nearby drainage lines (not expected). Dewatering activities will take place during shaft sinking and the operational phase. The cone of drawdown has been simulated to reach its maximum extent in year 12 of the simulation, with a maximum drop in water levels of 49 m close to the underground mine are, within a 3.6 km radius. Dewatering impacts are expected at some third party boreholes (located on the farms Wessels, Lehating 741 and Boerdraai 228). Related management actions focus on monitoring and an alternative supply where dewatering causes a loss of water supply to third parties.	High	Low
Air	Air pollution	There are a number of activities in all phases that have the potential to contribute to the pollution of air. The main contaminants associated with the mine include inhalable particulate matter less than 10 microns in size (PM10), larger total suspended particulates (TSP) that relate to dust fallout,	High (Operational phase)	Medium (Operational phase)

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
		Manganese (Mn) concentrations, SO2, NO2 and gaseous emissions mainly from vehicles and generators. The inhalable components can cause human health impacts at high concentrations over extended periods, while the larger particulate component can cause nuisance dust impacts such as soiling of grazing veld at high fallout quantities over extended periods. Other emissions types that were considered in the assessment include sulphur dioxide (SO2), oxides of nitrogen (NOx) diesel particulate matter (DPM) and carbon monoxide (CO). Neither TSP nor the other gaseous emissions are predicted to result in impacts of any significance. When considering the designed mitigation scenario, inhalable particulate (PM2.5 and PM10) concentrations are predicted to be in compliance with the National Ambient Air Quality Standards (NAAQS) at all receptors over the short- and long-term; however, the NAAQS are still predicted to be exceeded beyond the project boundary. It should be noted that the assessment considered the future NAAQS which are enforceable from 1 January 2030. Annual Mn concentrations are predicted to exceed the World Health Organisation (WHO) guideline off-site and at receptors even with mitigation. Related management actions focus on air quality management, monitoring, dust suppression and long term pollution prevention.	Low (all other phases)	Insignificant (all other phases)
	Greenhouse gas emissions	Greenhouse gases are “those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth’s surface, the atmosphere itself, and by clouds”. This property causes the greenhouse effect. Water vapour (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4) and ozone (O3) are the primary greenhouse gases in the Earth’s atmosphere. There are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine and bromine containing substances that contribute the greenhouse effect, the warming of the earth. There are a number of activities in all phases that have the potential to generate greenhouse gases. Clearing of vegetation during the construction phase will result in a loss of carbon sinks which absorb CO2. As operations progress, some carbon sinks will be regained through the rehabilitation of the previously cleared areas, however the carbon balance will not be completely restored. The GHG emissions from the project are however low and will not likely result in a noteworthy contribution to climate change on their own.	Insignificant	

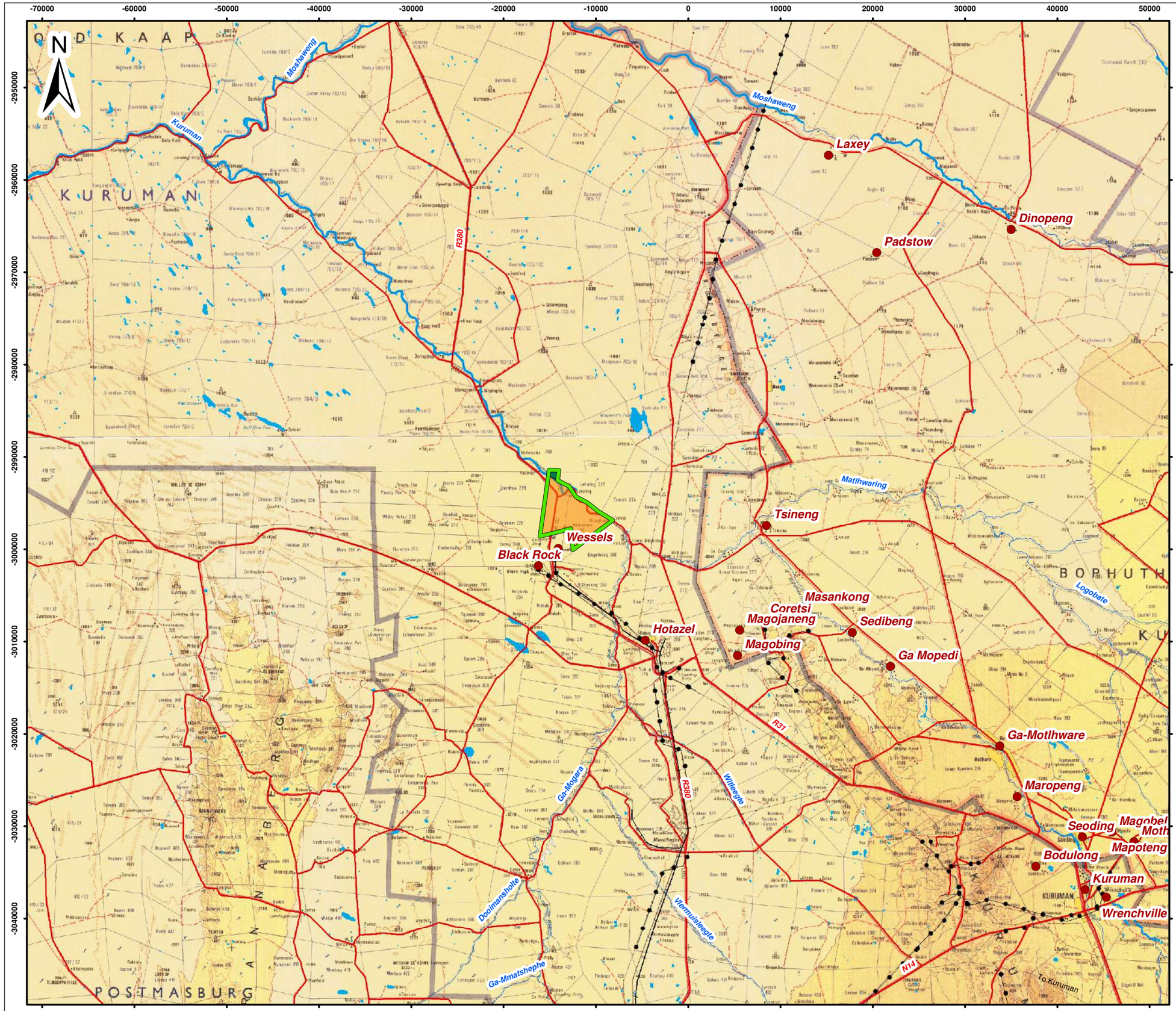
Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
Noise	Increase in disturbing noise levels	Two types of noise are distinguished: noise disturbance and noise nuisance. The former is noise that can be registered as a discernible reading on a sound level meter and the latter, although it may not register as a discernible reading on a sound level meter, may cause nuisance because of its tonal character. Mine activities/infrastructure present the possibility of generating both noise disturbances and noise nuisance in all phases prior to closure. In the unmitigated and mitigated scenarios, the noise impacts will extend off site and as such may affect third party receptors. Related management actions focus on noise control measures.	Medium	Low
Visual	Negative visual views	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 WRD, shafts and buildings) and the long term infrastructure (WRD) (where applicable) that will remain post closure. It is possible that some of the project infrastructure will be visible from the R380 which is approximately 1.5 km from the mine as well as some of the local residences which are approximately 2.5 km from the mine. The project and related infrastructure will be different to the rural visual landscape immediately surrounding the project area, but similar to the existing mining activities to the south of the project site. It was anticipated that the public and the community receptors will not be overly sensitive to the development given the presence of the existing mine infrastructure as well as other mining operations to the south of the project area. Visual impacts had also not been raised as a concern by any stakeholders. Related management actions focus on limiting vegetation clearance and rehabilitation.	High	Medium (before closure) Low (after closure)
Traffic	Road disturbance and traffic safety	Traffic impacts can occur during the construction, operational and decommissioning phases when trucks, buses, and private vehicles make use of the private and public transport network in and adjacent to the Mn48 Mine. The key potential traffic related impacts are on road capacity and public safety. Existing traffic volumes comprising public traffic and traffic from nearby mines that utilise the R380 are associated with an acceptable level of service in the context of the existing public and private road infrastructure. Safety risks associated with mining traffic making use of public road infrastructure include pedestrian accidents and vehicle accidents. Excessive wear and tear of roads can cause increased wear and tear on vehicles, and can contribute to increased accidents. Traffic accidents have the potential to injure people and animals. Related management	High	Medium

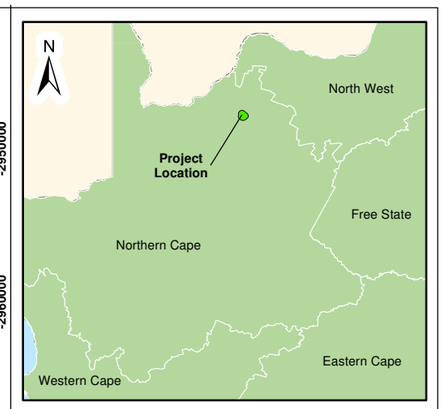
Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
		actions focus on the implementation of a transport safety programme, road signage, speed limits, lighting and road maintenance and upgrades.		
Blasting	Ground vibration, air blasts and fly rock	Blasting activities have the potential to impact on people, animals and structures located in the vicinity of the mining area. In the unmitigated scenario, surface blasting activities could cause injury to third parties and livestock through fly rock. Damage to third party infrastructure may also be caused by fly rock, ground vibration, and/or air blast. Related management actions focus on implementing a blast design and a blast management plan.	High	Low
Heritage/cultural and palaeontological resources	Loss of heritage/cultural and palaeontological resources	There are a number of activities/infrastructure in all phases prior to closure that have the potential to damage heritage and cultural resources, either directly or indirectly, and result in the loss of the resource for future generations. A number of archaeological sites associated with Middle Stone Age (MSA) as well as Later Stone Age (LSA) site linked with hunter gatherer communities have been identified and mapped in the project area and surrounds. In addition, various historical resources and graves have been identified. However, none of these archaeological, heritage and grave sites lie within or within close proximity to the infrastructure footprint areas. The palaeontological sensitivity of the project area is found to be medium, and the possibility of encountering Stromatolites during mining does exist. Related management actions focus on a chance find procedure.	Medium	Low
Socio-economic	Economic impact	In the broadest sense, all activities associated with the mine contribute towards a positive economic impact in all phases. Mining has a positive net economic impact on the national, local and regional economy. Direct benefits are derived from wages, taxes and profits. Indirect benefits are derived through the procurement of goods and services, and the increased spending power of employees. The net economic value added from the mining project will greatly exceed the net economic value that may be lost to agriculture. Related management actions focus on procurement of local goods and services, skills development programmes and closure planning.	Highly positive	Highly positive
	Inward migration	Mining projects often cause an influx of people in search of employment. This inward migration causes a range of secondary impacts such as increased pressure on infrastructure and services such as clinics and water supply, housing etc., as well as the potential development of informal settlements. Other secondary impacts include social ills such as an increase in crime and the spread	High	Low

Aspect	Potential impact	Summary of impact discussion and reference to mitigation measures for the proposed project	Impact significance	
			Unmitigated	Mitigated
		of diseases such as HIV/Aids. Related management actions focus on good communication, procurement and procurement programmes, HIV/AIDs and tuberculosis programmes and working together with neighbouring mines, and authorities to prevent the development of informal settlements.		
Land use	Change in land use	Mining-related activities and infrastructure have the potential to affect land uses both within the mine area and in the surrounding areas in all mine phases. This can be caused by physical land transformation and through direct or secondary impacts. Such secondary impacts could also include a loss of land use, loss of water supply etc. Grazing land would be affected and the possibility also exists that the quality of life at the two closest residences (Boerdraai and van Schalkwyk) would be reduced. Related management actions focus on rehabilitation and stakeholder engagement.	High (all project phases)	Medium (prior to closure) Low (post closure)

IMPACT STATEMENT

The assessment of the project presents the potential for negative impacts to occur (in the unmitigated scenario in particular) on the biophysical, cultural and socio-economic environments both on the project site and in the surrounding area. With management actions these potential impacts can be prevented or reduced to acceptable levels. It follows that provided the EMPr is effectively implemented there is no biophysical, social or economic reason why the project should not proceed.





Legend

- Consolidated Mining Right Area
- Khwara Mining Right Application Area
- Existing Mn48 Mining Right Area
- Towns
- Railway
- Powerline
- Roads
- Rivers
- Wetlands

0 1,5 3 6 9 12 Km

Scale: 1 : 400 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Mn48 (Pty) Ltd

Figure 1

Regional Setting

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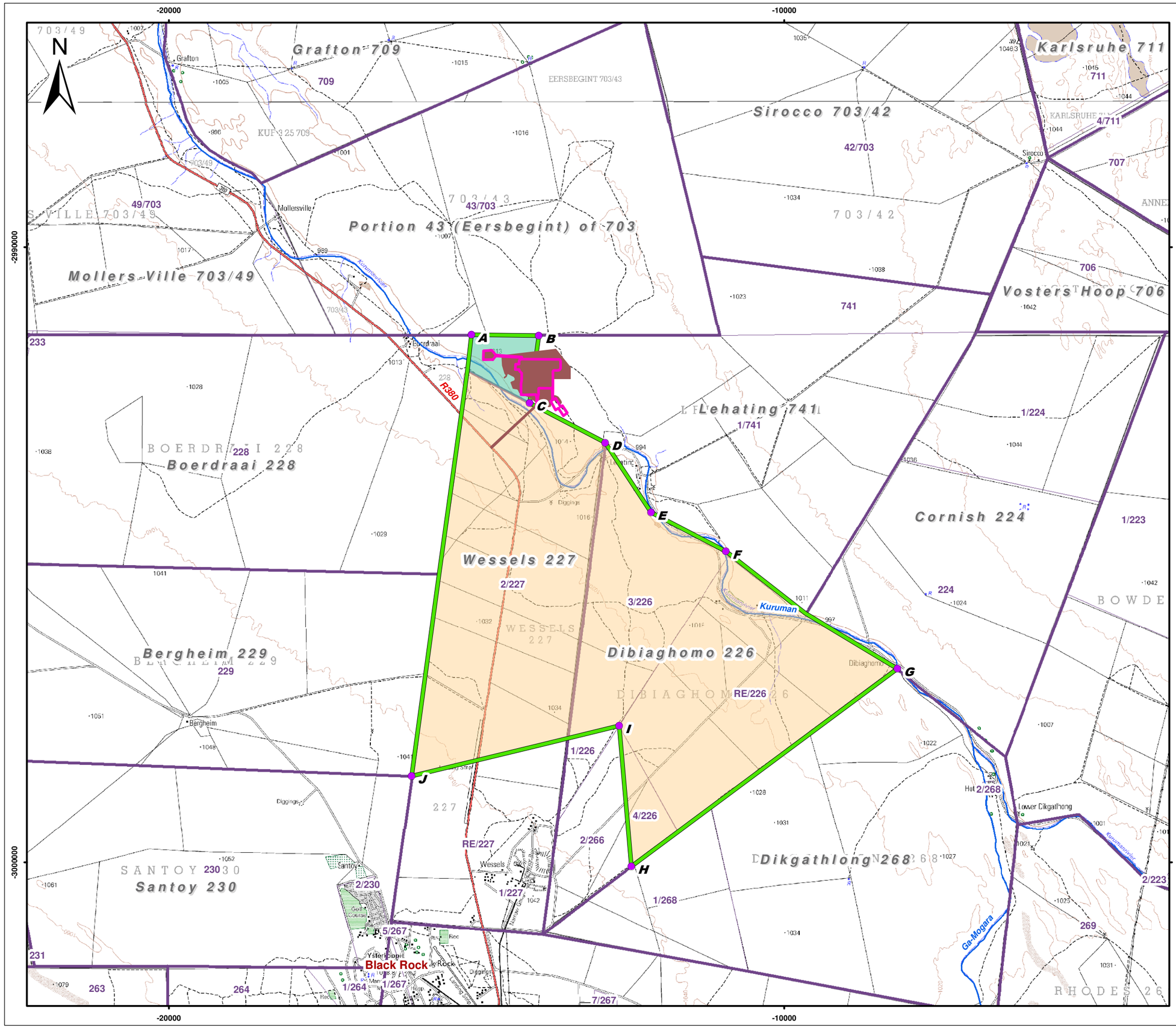

Legend

- Consolidated Mining Right Area
- Khwara Mining Right Application Area
- Existing Mn48 Mining Right Area
- Main Roads
- Rivers and Streams
- 20m Contour Lines
- Farm Boundaries
- Farm Portions
- Proposed Infrastructure Footprint
- Approved Infrastructure Outline

Co-Ords for Consolidated Mining Right Area

A	22°50'52.697"E	27°2'2.554"S
B	22°51'32.599"E	27°2'3.596"S
C	22°51'27.916"E	27°2'38.894"S
D	22°52'11.959"E	27°2'57.627"S
E	22°52'40.906"E	27°3'38.147"S
F	22°53'23.814"E	27°3'57.843"S
G	22°55'4.079"E	27°4'58.744"S
H	22°52'27.003"E	27°6'43.636"S
I	22°52'19.803"E	27°5'29.762"S
J	22°50'16.779"E	27°5'55.706"S

0 0,5 1 2 Km

Scale: 1 : 60 000 @ A3

Projection: Transverse Mercator
Datum: Hartebeeshoek, Lo23

Mn48 (Pty) Ltd

Figure 2

Local Setting

SLR Consulting (Africa) (Pty) Ltd
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720.12015.00011

2020/10/22