SCOPING REPORT

INTEGRATED ENVIRONMENTAL IMPACT ASSESSMENT

FOR

PROPOSED CENTRALISED WASTE WATER TREATMENT PLANT AND PLANNED EXPANSIONS REQUIRING CLEARING OF LAND

ASSMANG (PTY) LTD BLACK ROCK MINE OPERATIONS, SANTOY, NORTHERN CAPE:

ASSMANG MANGANESE

BLACK ROCK MINE OPERATIONS

AUGUST 2021

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PROJECT INFORMATION SHEET

PROJECT:

Proposed Centralised Waste Water Treatment Plant and Planned Expansions Requiring Clearing of Land

APPLICANT:

Assmang (Pty) Ltd, Black Rock Mine Operations

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COMPETENT AUTHORITY:

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REPORT STATUS:
Draft Scoping Report for comment from IAPs

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ABBREVIATIONS

Assmang	Assmang (Pty) Ltd
BRMO	Black Rock Mine Operations
CARA	Conservation of Agricultural Resources Act, No. 43 of 1983
DAF	Dissolved Air Flotation
DFFE	Department of Forestry, Fisheries and the Environment
DMR	Department of Mineral Resources
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
HIA	Heritage Impact Assessment
Ma	Mega-annum: a period of 1 million years
Mn	Manganese
MPRDA	Minerals and Petroleum Resources Development Act
Mtpa	Million tonnes per annum (or mega tonnes per annum)
NCDENC	Northern Cape Department of Environment and Nature Conservation
NCNCA	Northern Cape Nature Conservation Act, No. 109 of 2009
NEMA	National Environmental Management Act, No. 107 of 1998 NEMA EIA
NEMAQA	National Environment Management: Air Quality Act, No. 39 of 2004
NEMBA	National Environmental Management: Biodiversity Act, No. 10 Of 2004
NHRA	National Heritage Resources Act, No. 25 of 1999
NWA	National Water Act, No. 36 of 1998
RDL	Red Data Listed
RO	Reverse Osmosis
SAHRA	South African Heritage Resource Agency
SAHRIS	South African Heritage Resource Information System
SDF	Spatial Development Framework
SFSF	Super Fines Storage Facility
SBR	Sequential Batch Reactors
The Site	Areas within the boundaries of BRMO's properties and under the control of BRMO, unless specified otherwise
WWTW/P	Wastewater Treatment Works/Plant

1 INTRODUCTION

Assmang (Pty) Ltd mines manganese ore in the Black Rock area of the Kalahari, in the Northern Cape Province. The ore is mined from the Kalahari Manganese field. The Black Rock Mine Operations (BRMO) are approximately 80 km north-west of the town of Kuruman, in close proximity to the town of Hotazel.

In 1940, Assmang acquired a manganese ore outcrop on a small hillock known as Black Rock. Several large properties underlain by ore were subsequently found and acquired. Manganese ore mining operations were extended and currently include three underground mining complexes:

- Gloria (commissioned in 1975), which is producing medium grade carbonated ore;
- Nchwaning II and Nchwaning III (commissioned in 1981 and 2004 respectively) which is producing high-grade ore.

The proposed activities will include the construction of a centralised Waste Water Treatment Plant (WWTP), various expansions of administrative and service facilities and associated infrastructure. The expansion of wastewater treatment capacity will occur by rerouting the existing wastewater, that is currently treated at three separate facilities on each of the mines, to a centralised facility. The larger singular facility will also provide BRMO with an opportunity to upgrade the facility and prevent spills from occurring at the other existing facilities. Furthermore, the existing waste treatment works at Black Rock, Nchwaning II and Gloria will require decommissioning. A further aspect of the proposed development is the inclusion of a reverse osmosis plant to augment potable water supply at the mine. The RO Plant will produce a brine and it is proposed that this brine is sent to evaporation ponds for treatment such that water can be evaporated to leave salts that can then be disposed of to an appropriately licenced landfill.

The proposed activities will be undertaken at all three of BRMO mining operations (Gloria mine, Nchwaning II and Black Rock). The proposed development includes activities listed in terms of the National Environmental Management Act (Act 107 of 1998), as well as the National Environmental Management: Waste Act, 2008 (Act 59 of 2008), and thus BRMO has applied for an Integrated Environmental Authorisation in terms of the National Environmental Management Act. A scoping and environmental impact assessment (EIA) process must be undertaken, in accordance with the environmental impact assessment regulations GN. R 982 of 2014 as amended, to authorise the proposed activities. The proposed development also requires other environmental management permits, which include a water use licence, heritage resources management permits or exemptions, protected tree removal permits, and protected plant removal and transport permits.

1.1 REGIONAL LOCATION

BRMO is situated at Santoy in the Northern Cape Province approximately 80 km north-west of the town of Kuruman and 12 kilometres north-west of Hotazel. BRMO falls within the jurisdiction of the John Taolo Gaetsewe District Municipality, and the Joe Morolong Local Municipality.

Centre Co-ordinates	
Latitude:	-27.15315 South
Longitude:	22.88112 ° East

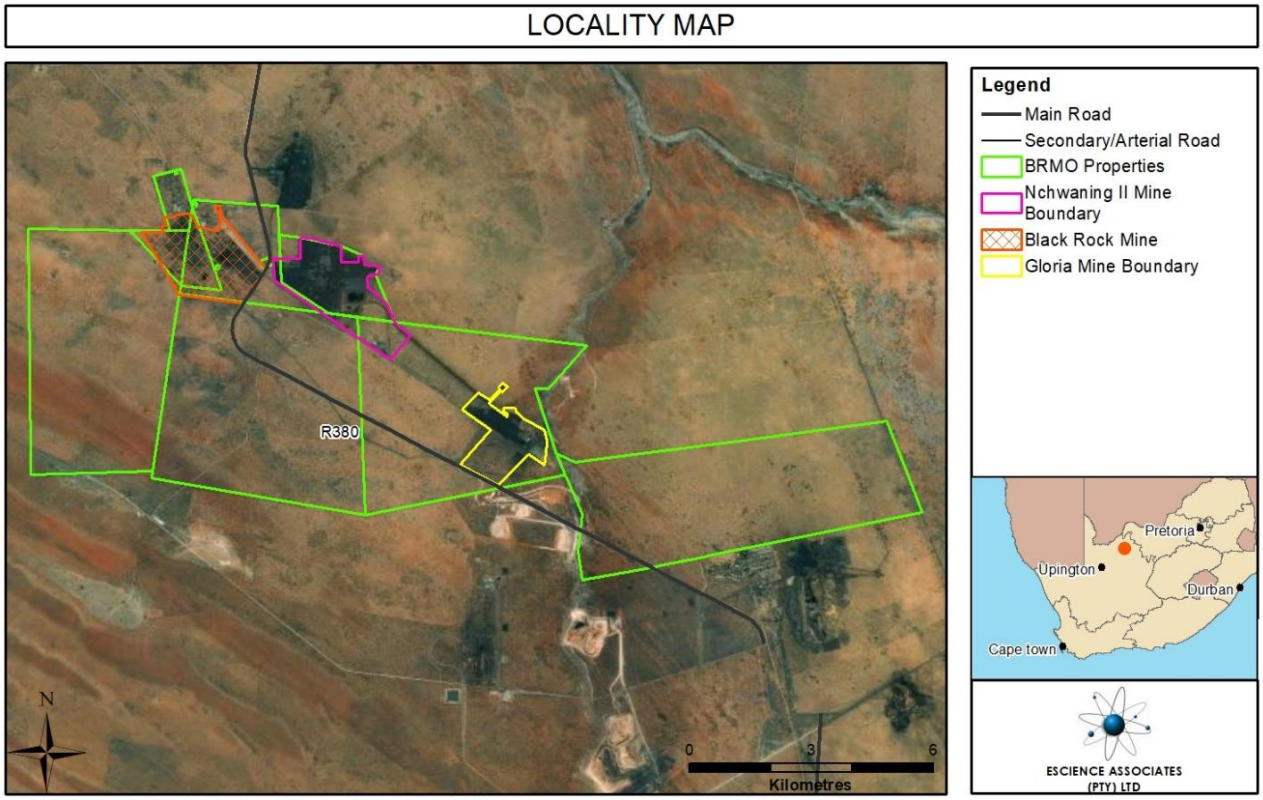

Figure 1-1: Location of Assmang Black Rock Mine Operations (BRMO)

1.2 ADMINISTRATIVE INFORMATION

The following section and associated set of tables, provides pertinent administrative information pertaining to BRMO, the associated mine lease area, as well as the environmental assessment practitioner who developed the scoping report (Table 1-1 to Table 1-6).

Table 1-1: Name and Address of Mine	
Owner and Name of Mine	Assmang (Pty) Limited, Black Rock Mine Operations
Company Registration	1935/007343/07
Physical Address	Black Rock Mine Operations, Santoy, Northern Cape
Postal Address	PO Box 187, Santoy, Northern Cape, 8491
Telephone	053 751 5260
Fax	053 751 5200
Senior General Manager	Koos Janse Van Vuuren

Table 1-2: Details of Environmental Specialist	
Name	Tshifhiwa Ravele
Physical Address	Main Offices Black Rock Mine Operations, Santoy, Northern Cape
Postal Address	PO Box 187, Santoy, Northern Cape, 8491
Telephone	053 751 5260
Fax	053 751 5200
Email	Tshifhiwa.Ravele@assmang.co.za

Table 1-3: Details of EAP	
Name of Company	EScience Associates (Pty) Ltd.
Contact Person	Mr. Abdul Ebrahim
Postal Address	PO Box 2950, Saxonwold, Johannesburg, 2132,
Physical Address	9 Victoria Street, Oaklands, Johannesburg, 2192
Telephone	011 718 6380
Fax	072 268 1119
Email	abdul@escience.co.za
Qualifications	Certified EAP, BEng Honours Environmental Engineering
Curriculum Vitae	Refer to Appendix 1

Table 1-4: Details of the EAPs		
Name	**Qualification**	**Experience**
Abdul Ebrahim	BEng (Hons) Environmental Engineering Certified Environmental Assessment Practitioner (EAP) Member of the Engineering Council of South Africa	20 Years
Sam Leyde	BSc (Hons) Mechanical Engineering	9 Years
Tiffany Seema	BSc (Hons) Geology and Geography BSc Geology	4 Years

Table 1-5: BRMO Mining Rights, Surface Rights and Title Deed Description Relevant to this application				
Mine	**Farm Name**	**Title Deed**	**Surface and Mining Rights**	**SG 21 Key**
Gloria	Ptn. 1 Gloria 266	No. 506 of 1966	Assmang (Pty) Ltd	C04100000000026600001
Black Rock	• Ptn. 2 Nchwaning 267 • Ptn 1 of Santoy 230 • Remaining Extent of Belgravia 264 • Ptn 1 of Belgravia 264	• G12/1940 -12/1940 • T542/1940 • G11/1940 • T540/1940	Assmang (Pty) Ltd	C04100000000026700002 C04100000000026300001 C04100000000026400000 C04100000000026400001
Nchwaning II	Ptn. 1 Nchwaning 267	T541/1940	Assmang (Pty) Ltd	C04100000000026700001

Table 1-6: Project Applicable Servitudes Relevant to this application		
Mine	**Servitude Type**	**Servitude No.**
Gloria	Rail	K38/83S
Gloria	Water pipeline (Sedibeng Water Vaal-Gamagara Supply)	K36/1978S

1.3 LAND TENURE AND ADJACENT LAND USE

Assmang (Pty) Ltd holds both the surface and mining rights over the properties encompassing the greater BRMO and its constituent mining operations (i.e. Black Rock, Nchwaning and Gloria Mines). The region surrounding BRMO is dominated by mining and agricultural (generally livestock production) with limited industrial operations adjacent to Nchwaning II. Land in the immediate vicinity of BRMO that is not used for mining purposes, is utilised for livestock farming (i.e. sheep, goats, and cattle) and game farming (Refer to Figure 1-2).

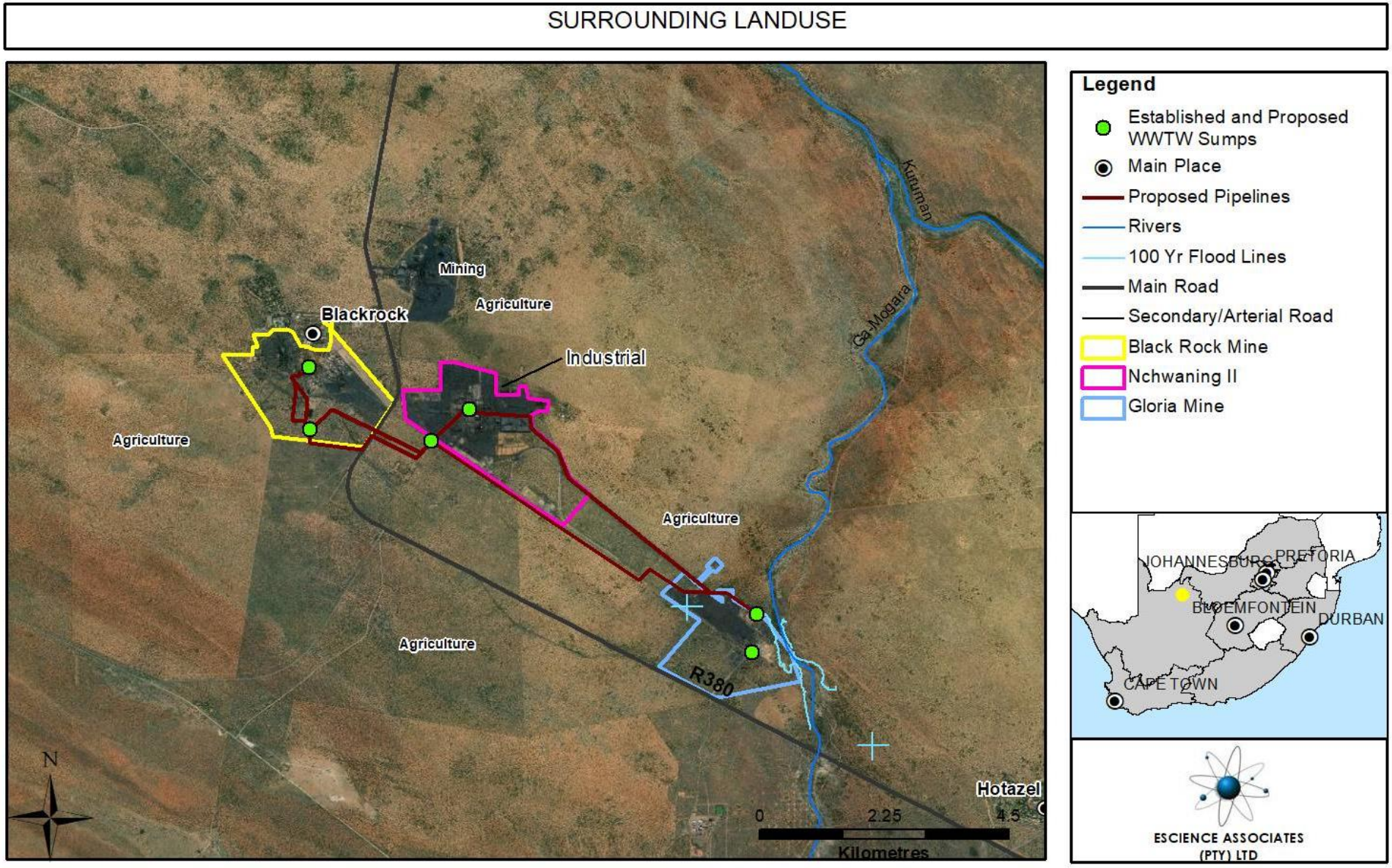

Figure 1-2: Surrounding Land Use

2 DESCRIPTION OF CURRENT AND PROPOSED ACTIVITIES

2.1 BACKGROUND

Mining has been undertaken since 1938, with the average grade of ore being approximately 42% manganese. The mine supplies high-grade manganese ore to both local and international markets. Only underground mining methods are presently utilised at BRMO. Black Rock Mine previously had open cast and underground operations, however these have ceased. The mining method for Gloria, as well as Nchwaning II and III, is via underground bord and pillar methods, making use of trackless machines and underground conveyer systems. The mine has a projected maximum capacity of 6.3 Mtpa.

Ore extraction activities are all undertaken below surface. There is no extraction of ore via opencast operations, with the exception of authorised borrow pits for construction purposes as part of on-going upgrades. Recovery of fines and low grade ore is also undertaken from surface stockpiles. The thickness of the mined seams in conjunction with underground crushing ensures that waste rock is not unnecessarily brought to surface. The ore is then further crushed, and separated into various grades, which are stockpiled in preparation for transport off the site. Transport is via rail and road.

The general descriptions herein convey a broad understanding of the facilities and activities associated with the proposed activities at all three BRMO mines. These descriptions are not exhaustive. Infrastructure typical of such mining activities is encountered on the site, which may not be covered in specific detail herein. These facilities and infrastructure are subject to repairs, general maintenance and upgrading in accordance with standard practices, and thus will be altered from time to time. Current infrastructure is within the footprint of existing, historical, and/or authorised activities. Proposed infrastructure will require clearing of undisturbed land where it does not overlap with existing disturbed areas.

2.1.1 GLORIA MINE

Ore is mined at Gloria using underground board and pillar methods, making use of trackless machines and underground conveyer systems. The thickness of the mined seams in conjunction with underground crushing ensures that waste rock is not unnecessarily brought to surface. At surface the ore is crushed, and separated into various grades, and stockpiled in preparation for transport off the site. Transport is via rail and road. Operations at Gloria were commissioned in 1975. Gloria complex is comprised of several mining and mining related activities, including:

- Offices, administration, and support facilities
- Engineering services and facilities
- Underground mining access shafts, vent shafts and related infrastructure;
- Ore Processing Plant;
- Ore (including fines) storage and laydown areas;
- Stacking, reclaiming and loading facilities for transportation of ore;
- Current and historical tailings facilities;
- Contractor laydown areas;
- Contractor camps

- Waste storage and separation facilities;
- Historical and current tailings storage facilities;
- Salvage Yards;
- Potable water and process water storage and management facilities;
- A sewage treatment plant;
- Sub-stations and electrical works;
- Bulk fuel storage and refuelling station;
- Explosives magazines;
- Unpaved and paved roads connecting the above and other BRMO operations;
- Other ancillaries typical of such a mining operation.

2.1.1.1 Underground Activities

Ore is drilled, blasted, and crushed underground before being conveyed to the processing facilities on the surface. Operations underground consist mainly of:

- Drilling
- Blasting
- Crushing
- Handling and loading of ore

Supporting facilities underground include, *inter alia*:

- Water storage and reticulation systems
- Engineering and support facilities
- Fuel storage facilities and re-fuelling bays

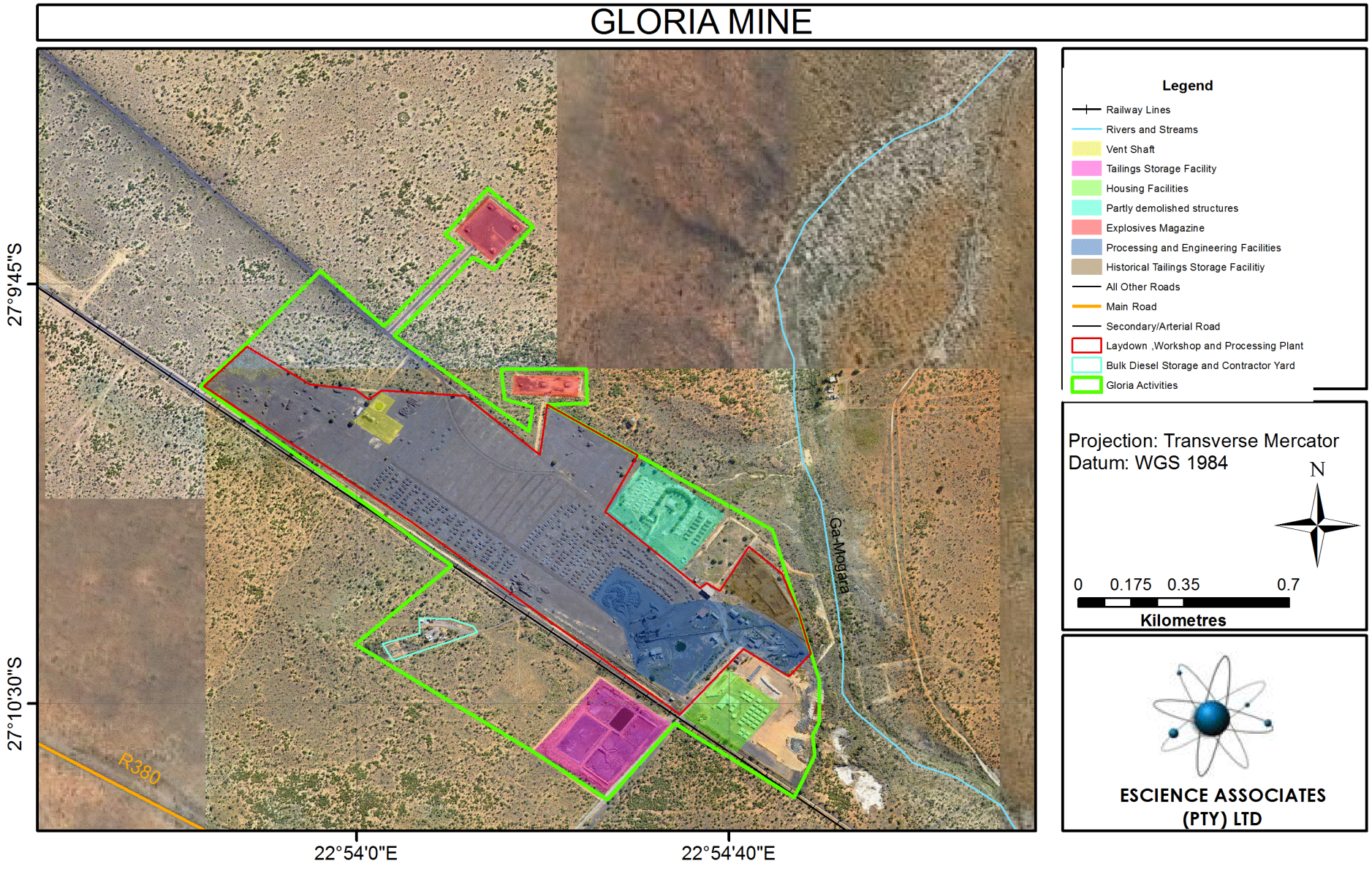

Figure 2-1: Current operations at Gloria mine

2.1.2 BLACK ROCK

Black Rock mine consists mainly of supporting and ancillary services for the active mining and ore processing facilities at the Gloria and Nchwaning mines. These consist of, *inter alia*:

- Offices, administration and support facilities
- Engineering services
- Old Black Rock mine works
- Old Black Rock Processing Plant
- Ore laydown areas
- Black Rock waste management
- Salvage Yards
- A landing strip and hangars
- Top soil stockpiles
- Potable water and process water storage and management facilities
- Tailings/Slimes storage facilities
- A back-up diesel power generation plant
- Sub-stations and electrical works
- Bulk fuel storage and refuelling station
- Explosives magazines
- Other ancillaries typical of such a mining operation
- Unpaved and paved roads connecting the above and other BRMO operations.

Notably the historical laydown areas, and other areas that have been disturbed in the past by mining activities, will not be rehabilitated as expansions in administrative, support, and engineering operations will cover these areas in future.

BRMO also owns residential facilities which are outside of the mining areas. Mining areas are fenced off. Therefore, these residential facilities are separately accessed from public roads and have no interconnecting access to mining areas. These include:

- Black Rock Village which includes recreational facilities, and a commercial area;
- Santoy housing and recreational club;
- District Six housing.

Facilities located within Black Rock's boundaries, which are owned and operated by external parties include:

- Eskom's Klipkop substation
- Sedibeng Water's Potable water storage facilities connected to the Vaal Gamagara Water Scheme pipeline.

The historical mine works are not active and are declared as a heritage site as per Van Vollenhoven 2019 (Report AE01928V). The remnants of the works are visible but fenced off.

2.1.2.1 NCHWANING III

Surface operations at Nchwaning III occur within the Black Rock operations. The Nchwaning III mine consists mainly of:

- A mine shaft
- A vent shaft
- Engineering workshops
- Administrative and support facilities

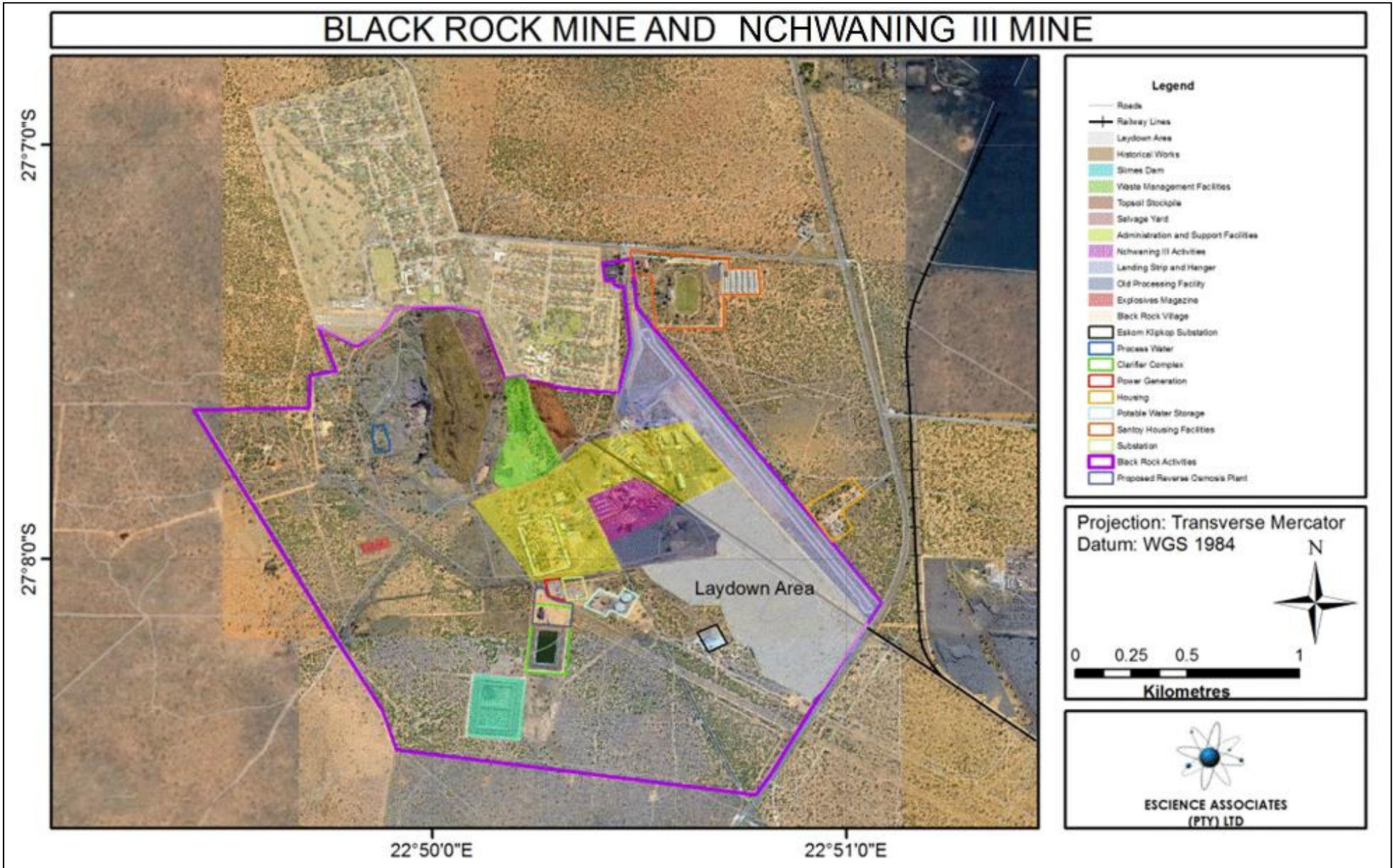

Figure 2-2: Overview of Black Rock Mine and Nchwaning III

2.1.3 NCHWANING II

Operations at Nchwaning II were first commissioned in 1981. The Nchwaning II complex is comprised of several mining and mining related activities, including *inter alia*:

- Offices, administration, and support facilities
- Engineering services and facilities
- Underground mining access shafts, vent shaft and related infrastructure
- Ore Processing Plants
- Ore (including fines) storage and laydown areas
- A rail loop
- Stacking, reclaiming and loading facilities for transportation of ore
- Current and historical tailings facilities, and reclamation thereof
- Contractor laydown areas
- Waste storage and separation facilities
- Salvage Yards
- Potable water and process water storage and management facilities
- A sewage treatment plant
- Sub-stations and electrical works
- Bulk fuel storage and refuelling station
- Explosives magazine
- Unpaved and paved roads connecting the above and other BRMO operations.
- Other ancillaries typical of such a mining operation

The Schoonspruit village is situated to the south of the complex and is outside of the mining areas. Mining areas are fenced off. Therefore, these residential facilities are accessed from separate public roads and have no interconnecting access to mining areas.

Good Rock Chemworks operates a manganese fines calcining plant on a separately owned piece of land in the north-eastern corner of the Nchwaning II complex. This is an independent commercial entity. This operation was formerly owned by Delta EMD.

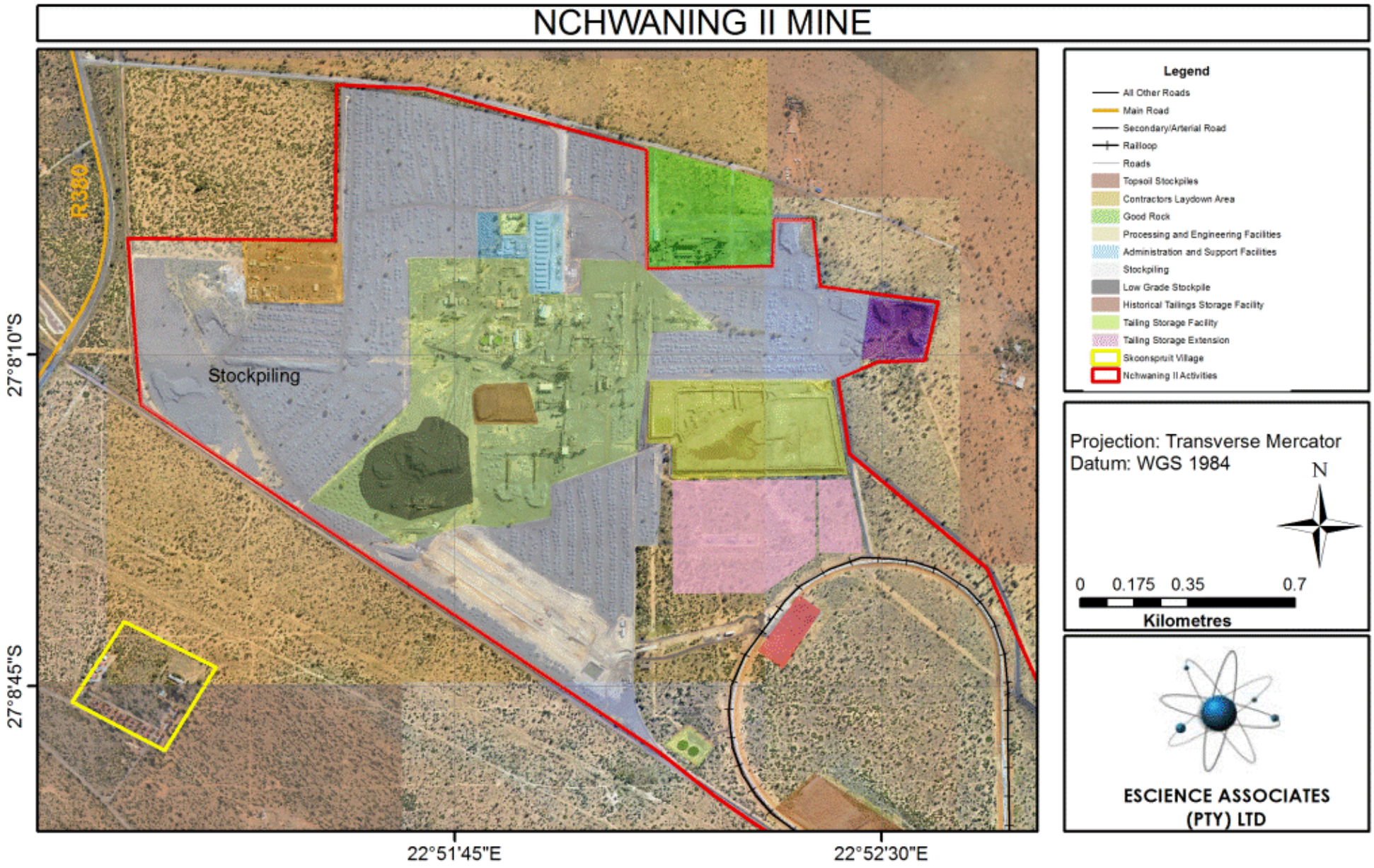

Figure 2-3: Overview of Nchwaning II Mine

2.1.4 UNDERGROUND ACTIVITIES

Ore is drilled, blasted, and crushed underground before being conveyed to the processing facilities on the surface. Operations underground consist mainly of:

- Drilling
- Blasting
- Crushing
- Handling and loading of ore

Facilities underground include, *inter alia*:

- Water storage and reticulation systems
- Engineering and support facilities
- Fuel storage facilities and re-fuelling bays

2.2 SCOPE OF THE PROPOSED ACTIVITIES

BRMO has undertaken various projects in the past five years to improve the production capacity of manganese at their operations, which has had increases to the workforce and started to put strain on the existing wastewater infrastructure at Black Rock and further increased the demand for water from the Vaal-Gamagara pipeline. These projects include projects that are either authorised or are in the process of obtaining an environmental authorisation, and includes:

- Nchwaning Tailings Storage Facility
- Gloria Super Fines Storage Facility
- Gloria Surface Infrastructure Upgrade
- Rail Loop Expansion
- Gamagara Railway Bridge Upgrade

The proposed operations plan to alleviate the strain on both of the Vaal Gamagara pipeline and wastewater infrastructure by implementing the following:

- Establishing a centralised wastewater treatment plant at Black Rock
- Decommissioning the existing wastewater treatment facilities at Gloria, Nchwaning II and Black Rock
- Establishment of conveyance infrastructure from existing wastewater treatment works to new centralised wastewater treatment plant;
- A Reverse Osmosis Plant for the treatment of groundwater;
- Treatment/disposal of brine

The full scope of the proposed activities will also include various expansions of administrative and service facilities and associated infrastructure.

A process flow diagram is shown in Figure 2-4. Further details of the proposed activities are provided in the ensuing sections.

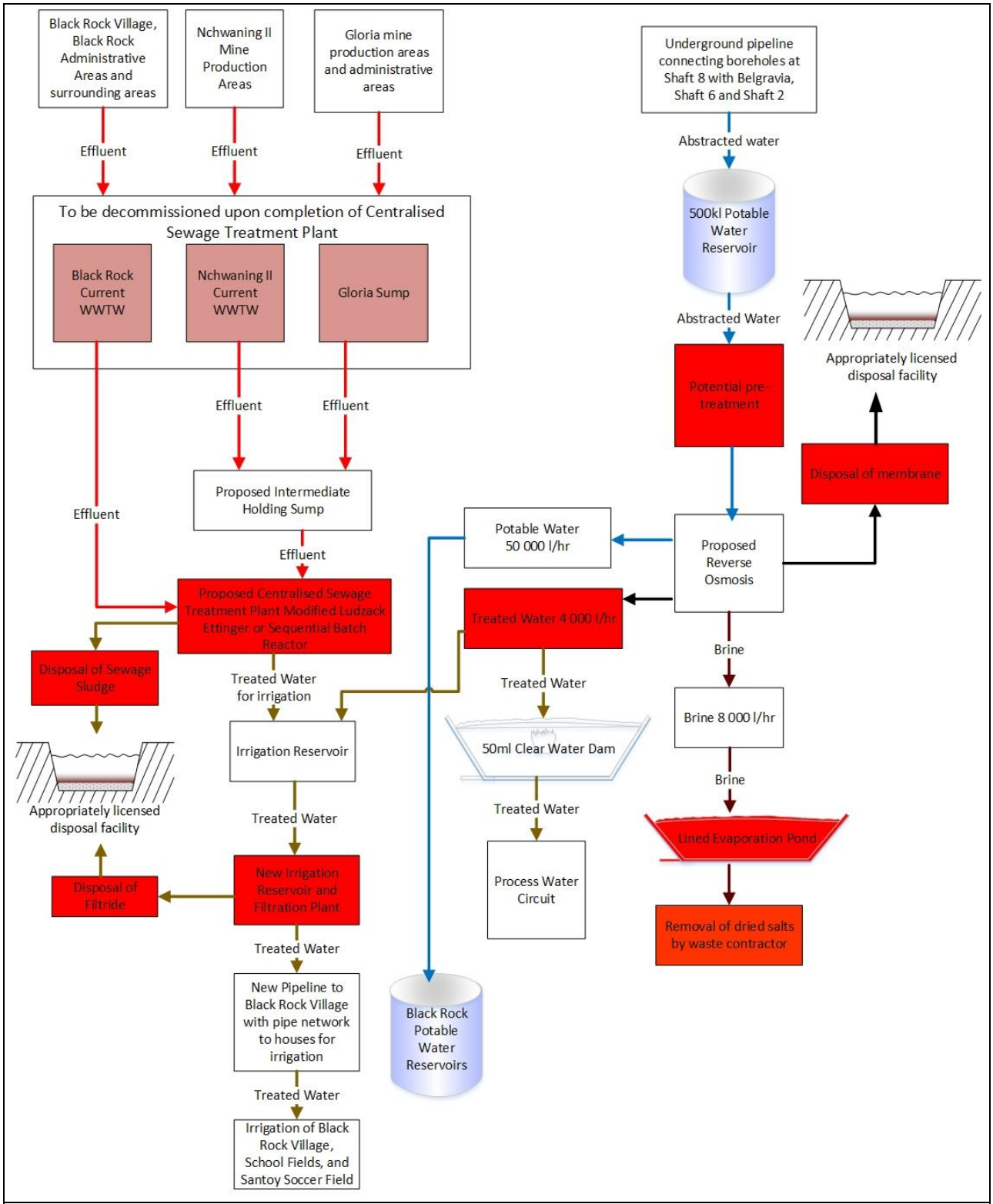

Figure 2-4: Process Flow Diagram

2.2.1 CENTRALISED WASTE WATER TREATMENT PLANT

The current daily sewage treatment capacity at Black Rock is 787 m^3, Nchwaning 315 m^3, Gloria 193 m^3, which equates to a daily processing capacity of 1295m^3. The centralised WWTP is proposed to cater for 4450 people that will generate an estimate 2280m^3 of sewage per day. The facility will process effluent and generate water either at irrigation quality or will be re-used as process water or further processed to drinking water standards.

The centralised plant will also be bunded to prevent environmental contamination from occurring as a result of the operation of the facility. The proposed location of the centralised WWTP in relation to the existing sewage treatment works is shown in Figure 2-5.

Water to be treated will originate from the shaft 8 borehole and alternatively, Belgravia, Shaft 6 and Shaft 2 boreholes. Water also might require pre-treatment prior to undergoing reverse osmosis.

The following infrastructure is proposed:

- At least 4 large Sequential Batch Reactors (SBRs) (to accommodate the immediate need to decommission the Gloria and Nchwaning II treatment facilities)
- Additional area for 2-4 large SBRs (to accommodate the decommissioning of the Black Rock treatment facility and additional capacity for future expansions)
- Inlet works (i.e. sump)
- Sludge handling (e.g. drying beds)
- Solids handling (i.e. from screening)
- Effluent treatment (i.e. disinfection and distribution)
- Other packaged-type treatment technologies

Other proposed developments to the mine infrastructure include:

- Pipeline from Shaft 8 connecting to Belgravia Shaft 6 and Shaft 2 to transport water to the 500KL dam (established and authorised as per WULA 10/D41M/ABEGJ/3490)
- Pipeline from 500KL potable reservoir to the Reverse Osmosis (RO) plant
- Pipeline from RO plant to the two existing potable water reservoirs at Black Rock (Reservoirs established and authorised as per WULA 10/D41M/ABEGJ/3490)
- New Irrigation buffer dam and filtration plant
- Pipeline from irrigation buffer dam and filtration dam to existing irrigation dam at BRMO village
- Pipeline from centralised sewage treatment plant to BRMO irrigation dam
- Sewage holding sump at Nchwaning/Gloria pipeline intersection

The existing WWTW locations and the proposed centralised WWTW locations are illustrated in Figure 2-6. The preferred pipeline alignments and locations are illustrated in Figure 2-6. The layout may be further refined during the EIA phase based on findings of the environmental impact assessment process and more detailed designed information.

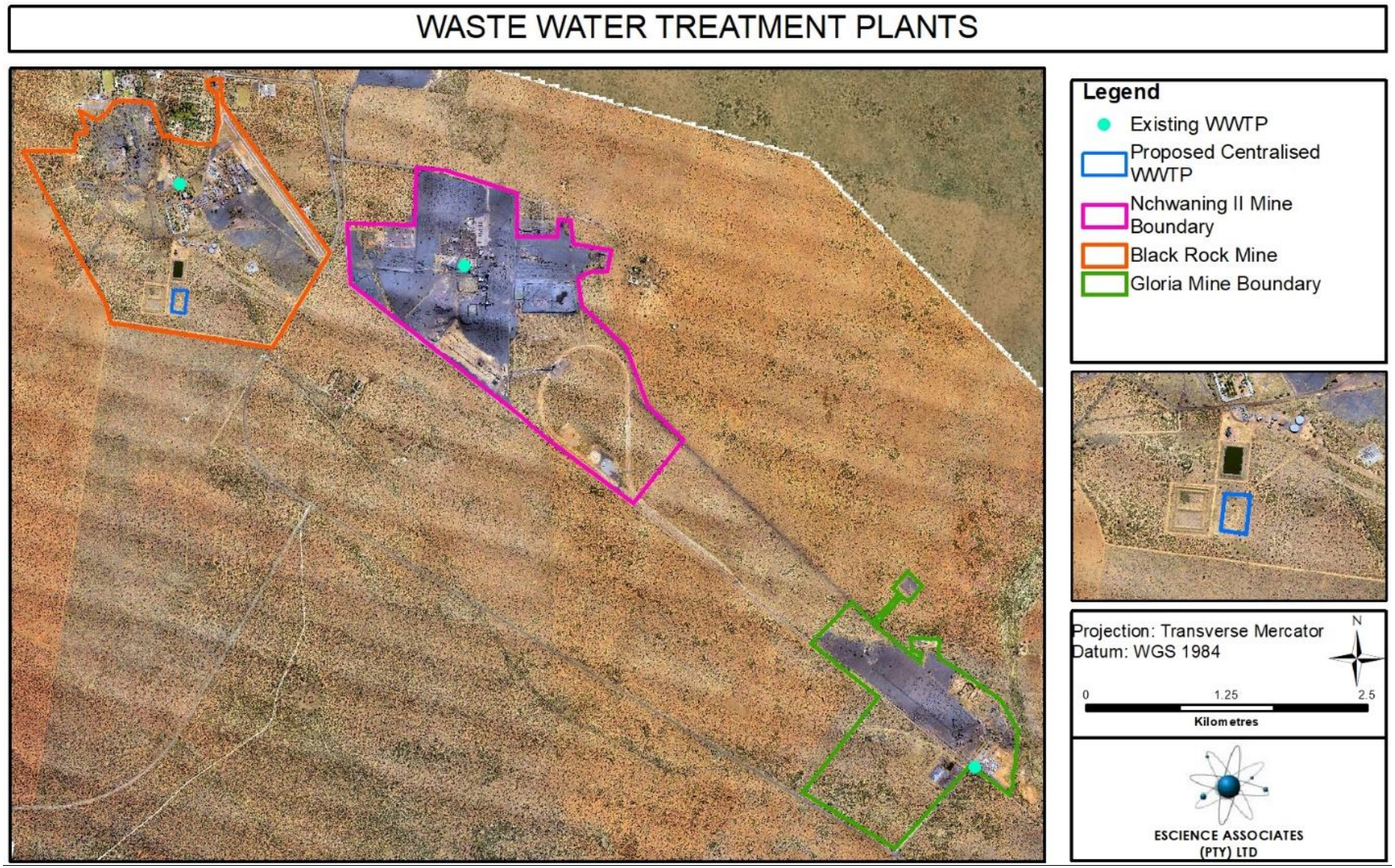

Figure 2-5: Location of existing and proposed Waste Water Treatment Plants

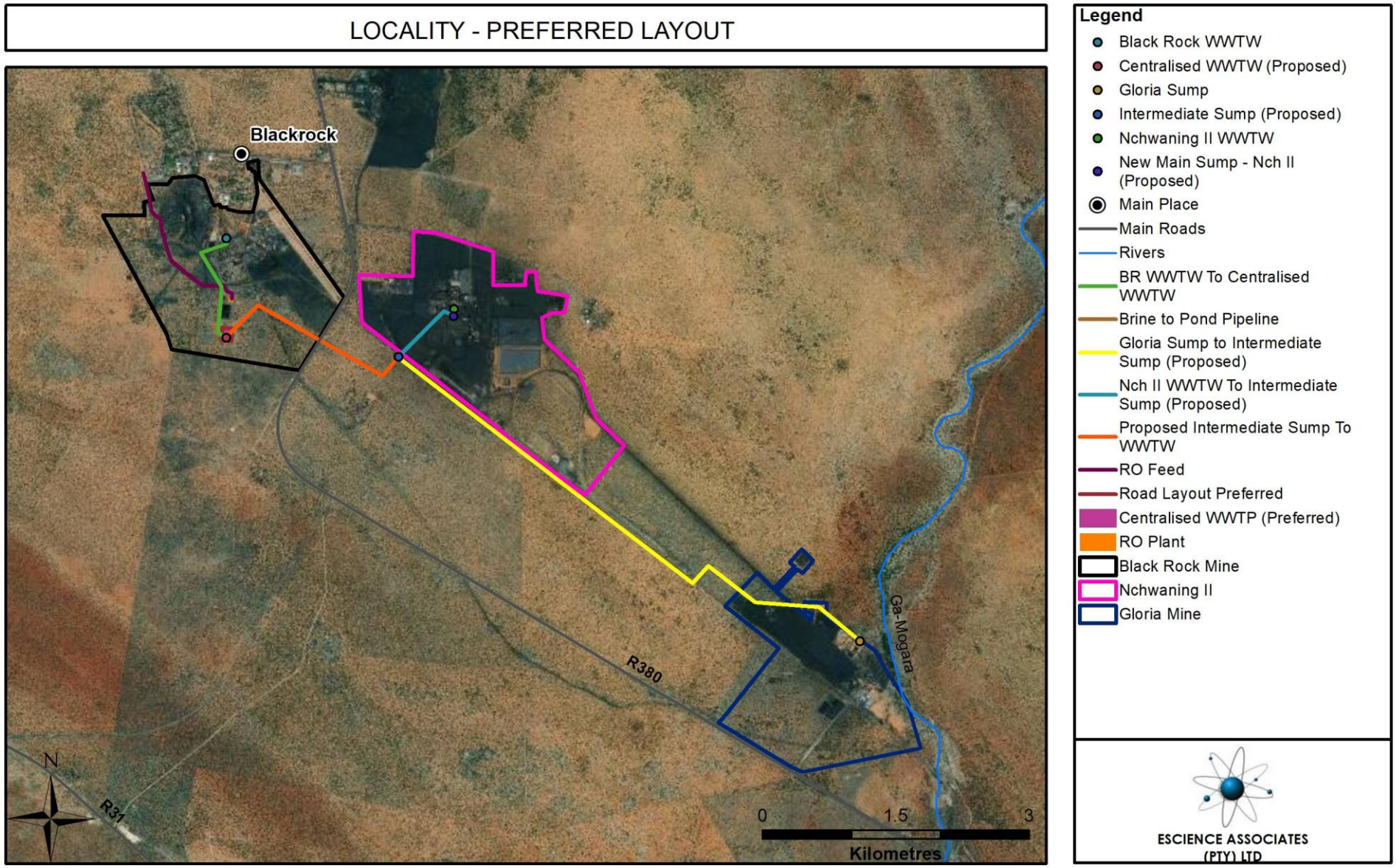

Figure 2-6: Location of proposed Waste Water Treatment Plant and Pipeline routes

2.2.1.1 Further Treatment of Effluent for Re-use

After the wastewater is screened, it will then undergo biological treatment. Thereafter, for re-use purposes, the effluent will be treated further in the water treatment plant, consisting of the following unit processes:

a. Coagulation and flocculation
b. Dissolved air flotation (DAF)
c. Media filtration
d. Ultra-filtration (UF)
e. Reverse osmosis (RO)
f. Remineralisation
g. Disinfection
h. Distribution

2.2.1.2 Brine Treatment

The RO Plant will produce a brine and it is proposed that this brine is sent to evaporation ponds for such that water can be evaporated to leave salts that can then be disposed of to an appropriately licenced landfill.

2.2.2 REVERSE OSMOSIS PLANT

A reverse osmosis plant, separate from the WWTW, is proposed to treat ground water. - Shaft 8 borehole will be used to feed the 500 kl dam, alternate boreholes to be used when there are challenges with Shaft 8 are Belgrave, Shaft 6 and shaft 2.

Existing and proposed Infrastructure includes:

- Existing Pipeline from Shaft 8 connecting to Belgravia Shaft 6 and Shaft 2 to transport water to the 500KL dam (established and authorised as per WULA 10/D41M/ABEGJ/3490)
- Proposed Pipeline from 500KL potable reservoir to the Reverse Osmosis (RO) plant
- Proposed Pipeline from RO plant to the two existing potable water reservoirs at Black Rock (Reservoirs established and authorised as per WULA 10/D41M/ABEGJ/3490)

The RO plant will receive up to 62 000 litres per hour with the following outputs:

- 50 000 litres of Portable water per hour;
- 4000 litres of Waste water per hour;
- 8 000 litres of Brine per hour.

Waste water from the RO plant will be transferred to the 50 Mil dam (Licensed) -Waste water will be reused as process water at Nchwaning II, or pumped to the irrigation reservoir - to be used for irrigation.

The old slimes dam (compartment with a penstock), will be used for the storage and treatment of brine. Capacity of the slimes dam in approximately 200 000litres.

2.2.3 EXPANSIONS – CLEARANCE OF LAND

The activities included herein are largely for the construction of infrastructure envisaged as part of BRMO 5-10 year plan at the mine as most of these do not require environmental

authorisation in isolation, such as for the establishment of housing, offices, recreational buildings, ore stockpiles, however as a result of Black Rock Mining Operations potential for phased impacts exceeding the threshold for clearing of indigenous vegetation, these require environmental authorisation. As such in order to pre-empt this need for clearance of vegetation in the future, BRMO proposes to undertake the clearance of vegetation for the envisaged activities prior to commencement with those activities:

- office space
- recreational facilities
- housing or contractor camps
- other mining support infrastructure
- ore stockpiles

Additionally, activities that require licencing include the establishment of:

- Diesel storage
- Establishment of roads
- Electrical transmission lines

The proposed development areas that require clearance of land are illustrated in Figure 2-7.

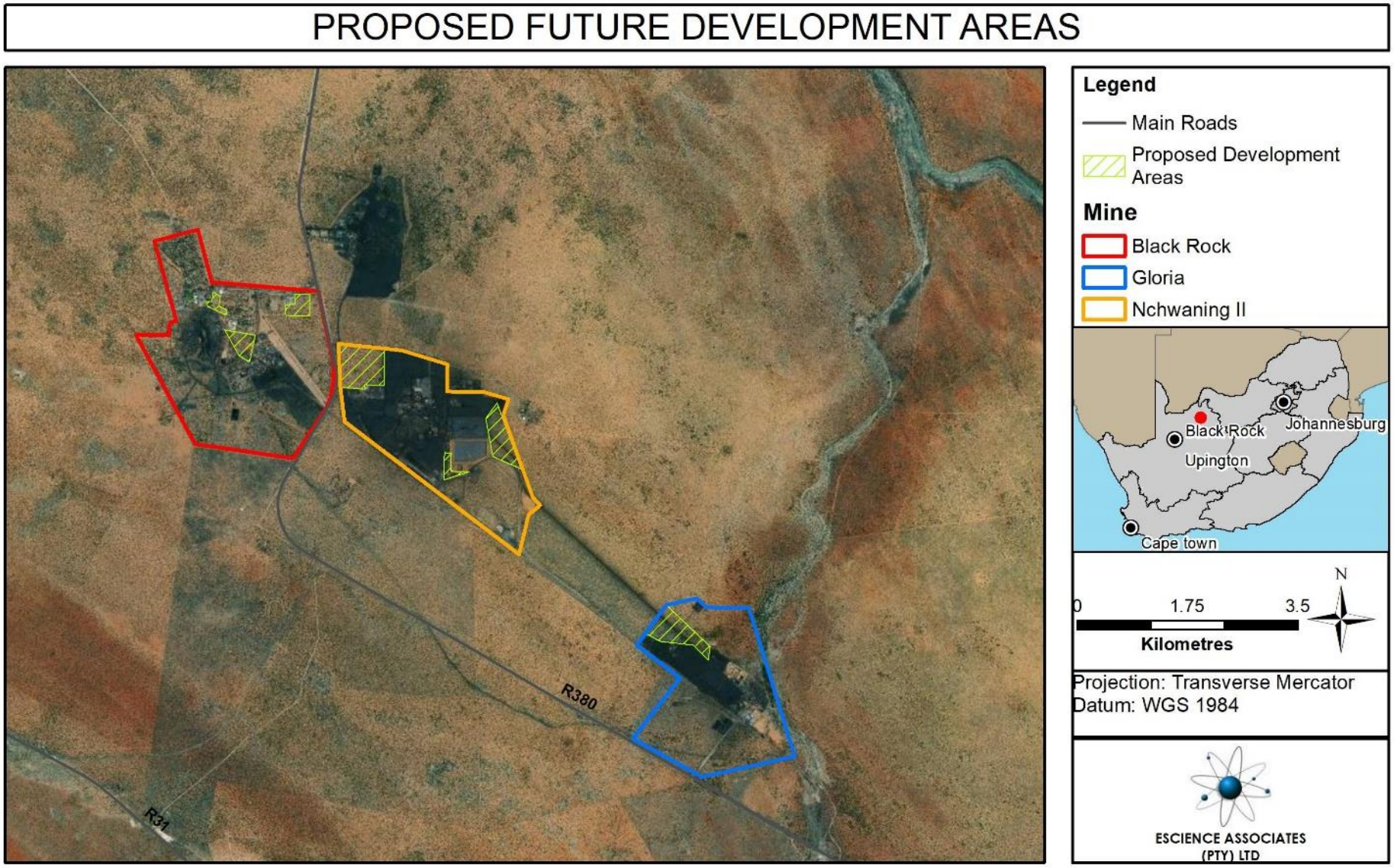

Figure 2-7: Location of Assmang Black Rock Mine Operations and proposed development areas requiring clearance of vegetation (BRMO)

A broad description of the activities to be undertaken for the development of the CWWTP and clearance of land in the construction, operational and decommissioning phases is given in the following sections.

2.2.4 CONSTRUCTION PHASE

The construction phase will broadly consist of:

- Removal and relocation of protected plant species.
- Clearing of remaining vegetation and establishment of roads, contractor laydown area, and project service facilities
- Excavation and stockpiling of topsoil
- Excavation and stockpiling of subsoil
- Site preparation (levelling, compaction, drainage layout et cetera) and establishment of civil structures for the centralised WWTP and RO plant
- Installation of effluent and wastewater conveyance infrastructure (pipelines, pumps et cetera and their related civil, mechanical, and electrical works)
- Construction of buildings
- Preparation of stockpile laydown areas
- Infrastructure establishment (bunds, storage tanks, drying beds offices, contractor camps, etc.)
- Commissioning
- Erecting a fence around the centralised WWTP

2.2.5 OPERATIONAL PHASE

The operational phase will consist of:

- Deposition and treatment of sewage
- Conveyance of wastewater
- Operation of the RO plant to treat water
- Disposal/treatment of brine
- The use of the expansion areas for various administrative operations and services
- The stockpiling of ore, product and other material
- General surface mining operations
- General maintenance of the facility

2.2.6 CLOSURE AND DECOMMISSIONING PHASE

The closure and decommissioning phase will broadly consist of:

- Removal of wastewater and water conveyance infrastructure, and demolition of any other related structures (e.g. shelters for personnel etc.)
- Shaping and capping of the brine disposal facility
- Ripping and scarifying of roads, and other compacted footprints
- Depositing of subsoil and topsoil, rehabilitation and aftercare

2.3 ALTERNATIVES CONSIDERED

The EIA regulations require that alternatives be considered. The regulations define "alternatives", in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the -

(a) property on which or location where the activity is proposed to be undertaken;

(b) type of activity to be undertaken;

(c) design or layout of the activity;

(d) technology to be used in the activity; or

(e) operational aspects of the activity; and

(f) includes the option of not implementing the activity;

A summary of alternatives considered is set out in Table 2-1. As the proposed development is inclusive of multiple components, the various aspects will be assessed individually to determine the possible alternatives.

The expansion to the wastewater treatment capacity at BRMO can be undertaken either through the establishment of centralised wastewater treatment facility or through the expansion of the existing wastewater treatment plants and potential establishment of an additional facility in the event of required capacity not being adequate due to expansion constraints. The Nchwaning Wastewater treatment plant is surrounded by other processing infrastructure and as a result is not viable for expansion. The wastewater treatment plant at Gloria mine has limited space as mine expansion is encroaching the facility. The facility is adjacent to the railway line and the access road are limiting expansion to the West and South. Therefore, the only other viable expansion is to the Black Rock wastewater treatment. There is a need through to drastically increase capacity at Nchwaning II and this would likely require the conveyance of wastewater from Nchwaning II to Gloria or Black Rock for treatment. Another option would be to establish an additional Wastewater treatment facility at Nchwaning II.

The alternatives are outlined as follows to initially account for the Activity alternatives, followed by location and layout and then technological alternatives:

Alternative 1

- Develop centralised WWTP to handle increased wastewater output at BRMO
- Conveyance of wastewater from existing facilities to centralised facility
- Implement RO plant to improve quality after wastewater treatment
- Decommissioning the existing wastewater treatment facilities at Gloria, Nchwaning II and Black Rock
- Treatment/disposal of brine in drying beds

Alternative 2

- Continue operations at the existing wastewater treatment works (WWTW) and expand the current Black Rock WWTW to accommodate demand as expansion of the Gloria and Nchwaning II sewage treatment plants (STP) is not viable.
- Some conveyance of excess wastewater from Gloria and Nchwaning II WWTW to Black Rock
- No additional treatment of water quality

Table 2-1: Breakdown of considerations of alternatives			
	Alternative 1 _Establishment of Centralised WWTW and RO Plant, with conveyance of Wastewater from existing facilities	Alternative 2 – Expansion of Black Rock WWTW and conveyance of excess wastewater to Black Rock for treatment.	No Go Alternative – Continued operation of existing facilities with no expansion or new development
Property or location alternatives	Property and locational alternatives at Black Rock Mine are to be assessed. Two routes for transfer of wastewater outlined from Gloria	Existing facilities locations to be used in addition to expansion of facilities at Black Rock.	Continued operations at existing WWTW with no additional site being required.
Design or layout of activity	The layout of the proposed activity is based on existing servitudes to allow for the efficient conveyance of wastewater with minimal requirement for the clearance or disturbance of vegetation. In terms of the location of the centralised STP and RO plant, are based on the proximity to the potential brine disposal site at the unused Black Rock tailings dams.	Layout remains as is, the exception being the potential expansion to Black Rock existing WWTW.	Current layout of operations remains unchanged
Type of activity	Various activities taking in place, including: • The development of a road, the development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or wastewater with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres. • The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation. • The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation	Expansion to wastewater treatment capacities includes: • The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution.	No new activities being undertaken.

	governing the release of emissions, effluent or pollution. • The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent		
Technology to be used in the activity	Various technological alternatives are discussed further within Chapter 2.5 including Modified Ludzack-Ettinger (MLE) Process, Sequential Batch Reactor (SBR) and Integrated Fixed Film Activated Sludge (IFAS). Various piping alternatives will also be under consideration, such as the material that will be used	Existing operations include the established sequential batch reactors at all three mines. No implementation of the RO plant. Conveyance of wastewater still required to handle excess wastewater from Gloria and Nchwaning II WWTW.	Continuation of SBR operations at existing STPs.
Operational aspects of activity	Treatment of wastewater using MLE or SBR with further water treatment at the reverse osmosis plant. Additional conveyance of wastewater from various mines to centralised plant.	Continued treatment of wastewater using SBR. Conveyance of wastewater from Nchwaning and Gloria to Black Rock WWTW.	Continued treatment of wastewater using SBR.

2.4 LOCATION AND LAYOUT ALTERNATIVES

The proposed development is planned to take place within the current extent of the BRMO boundary. Figure 2-8 and Figure 2-9 illustrate the proposed wastewater pipeline routing and the alternatives under consideration. The current location for the centralised wastewater treatment plant has been selected due to its remoteness and proximity to existing unused tailings dams at Black Rock Mine which are proposed as disposal sites for the brine from the reverse osmosis plant.

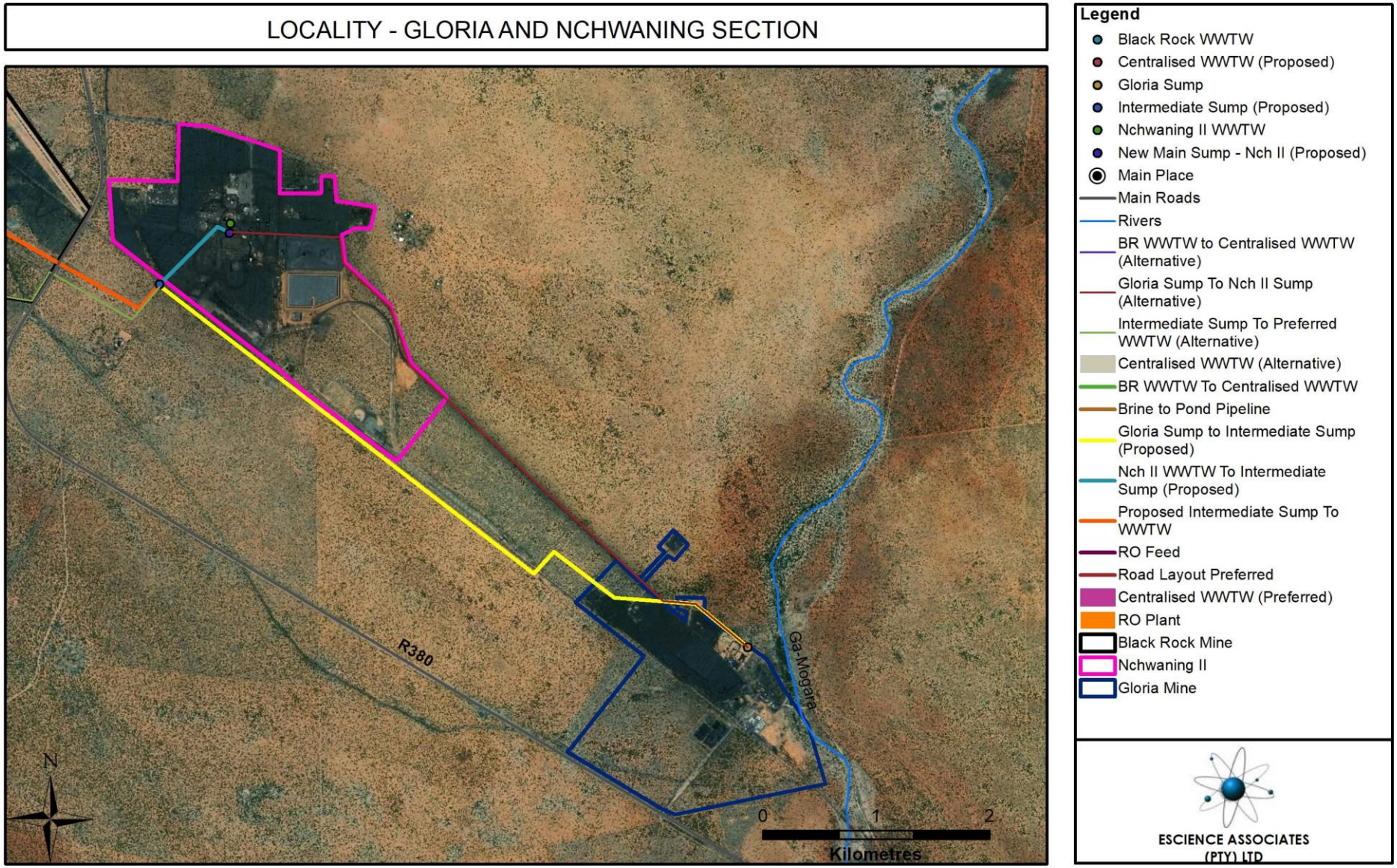

Figure 2-8: Proposed location alternatives for the conveyance of wastewater from Gloria Sump to Centralised Wastewater Treatment Works via Nchwaning II WWTW and/or proposed intermediate sump

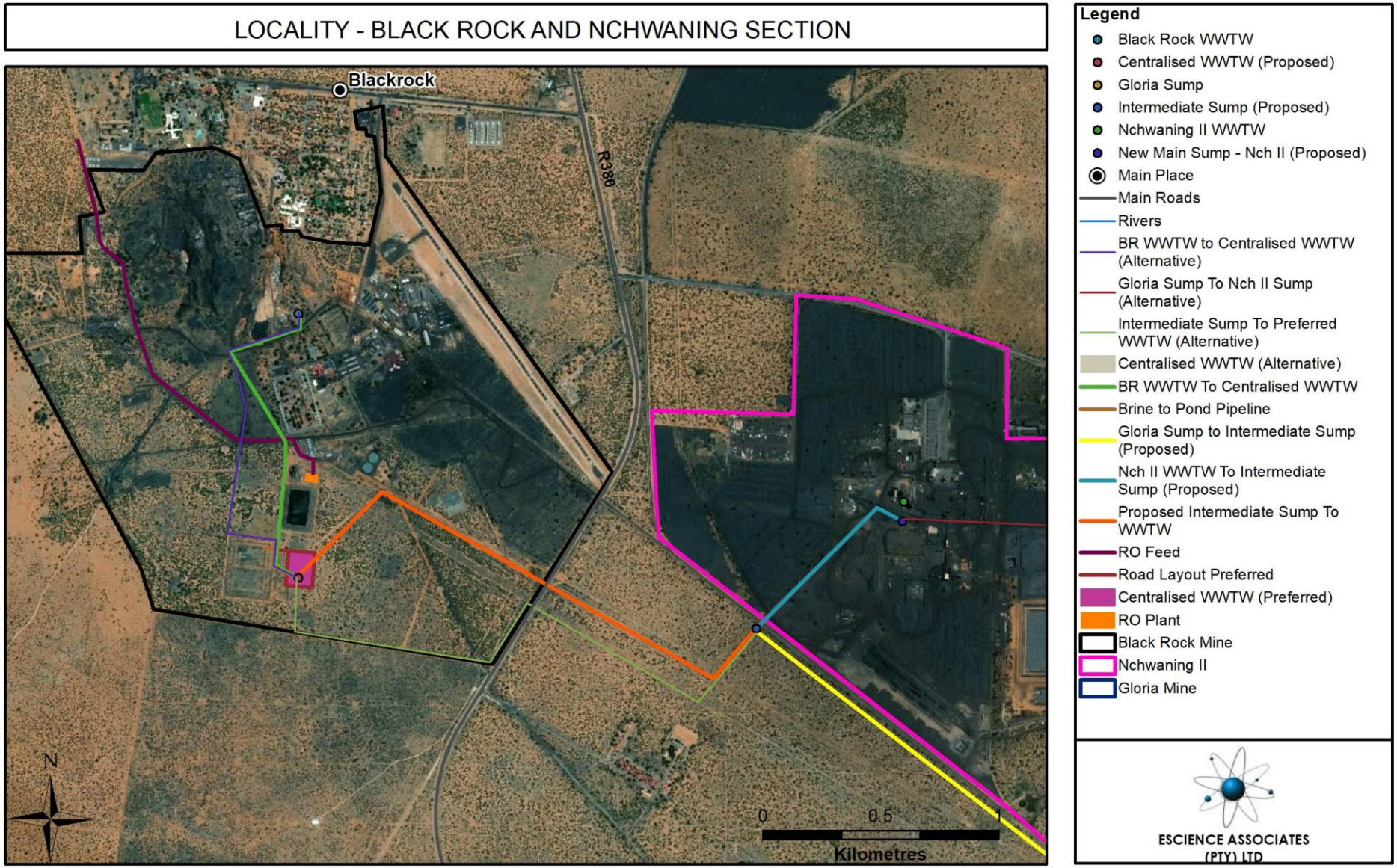

Figure 2-9: Proposed layout of wastewater conveyance pipelines to the proposed Centralised Wastewater Treatment Works from Nchwaning WWTW (and Gloria WWTW via Nchwaning II WWTW or the Proposed Intermediate Sump) and Black Rock WWTW

2.5 TECHNOLOGICAL ALTERNATIVES

Numerous technological alternatives exist for the treatment of wastewater with a few of the preferable methods outlined below. In terms of the conveyance of waste water, technological alternatives other than conveyance through piping have not been considered.

2.5.1 MODIFIED LUDZACK-ETTINGER PROCESS (MLE)

The MLE process operates by taking influent through an anoxic storage tank followed by anoxic (aerobic) with recirculation to the anoxic tank whilst removing effluent and the excess sludge.

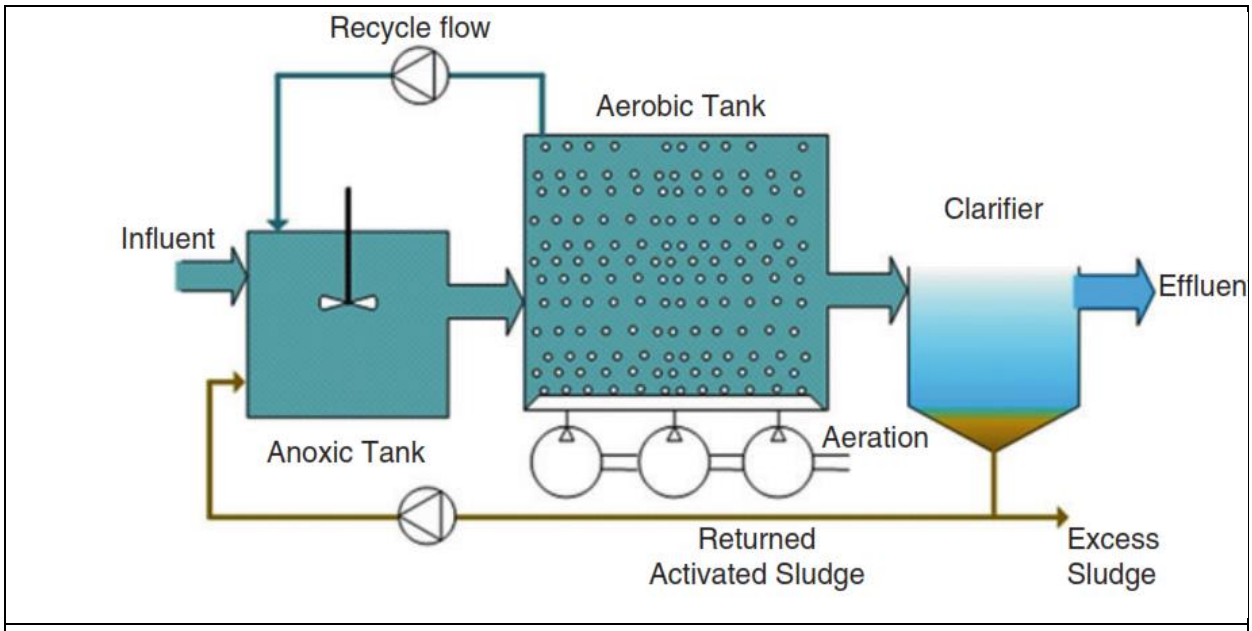

Figure 2-10: Basis of membrane bioreactor with denitrification

The process can also add carbon sources such as methanol, acetic acid or glycerine to enhance denitrification.

Advantages

- Better effluent quality;
- Smaller footprint;
- Ease of operation;
- Automated procedure.

Disadvantages

- Higher OPEX and CAPEX;
- Membrane is costly;
- Operational costs for energy usage and chemicals required for cleaning.

2.5.2 SEQUENCING BATCH REACTORS (SBR)

The SBR process is one that operates in the following manner and is reliant on separating the liquids from the waste sludge by mixing the materials and then allowing the waste sludge to settle (refer to Figure 2-11).

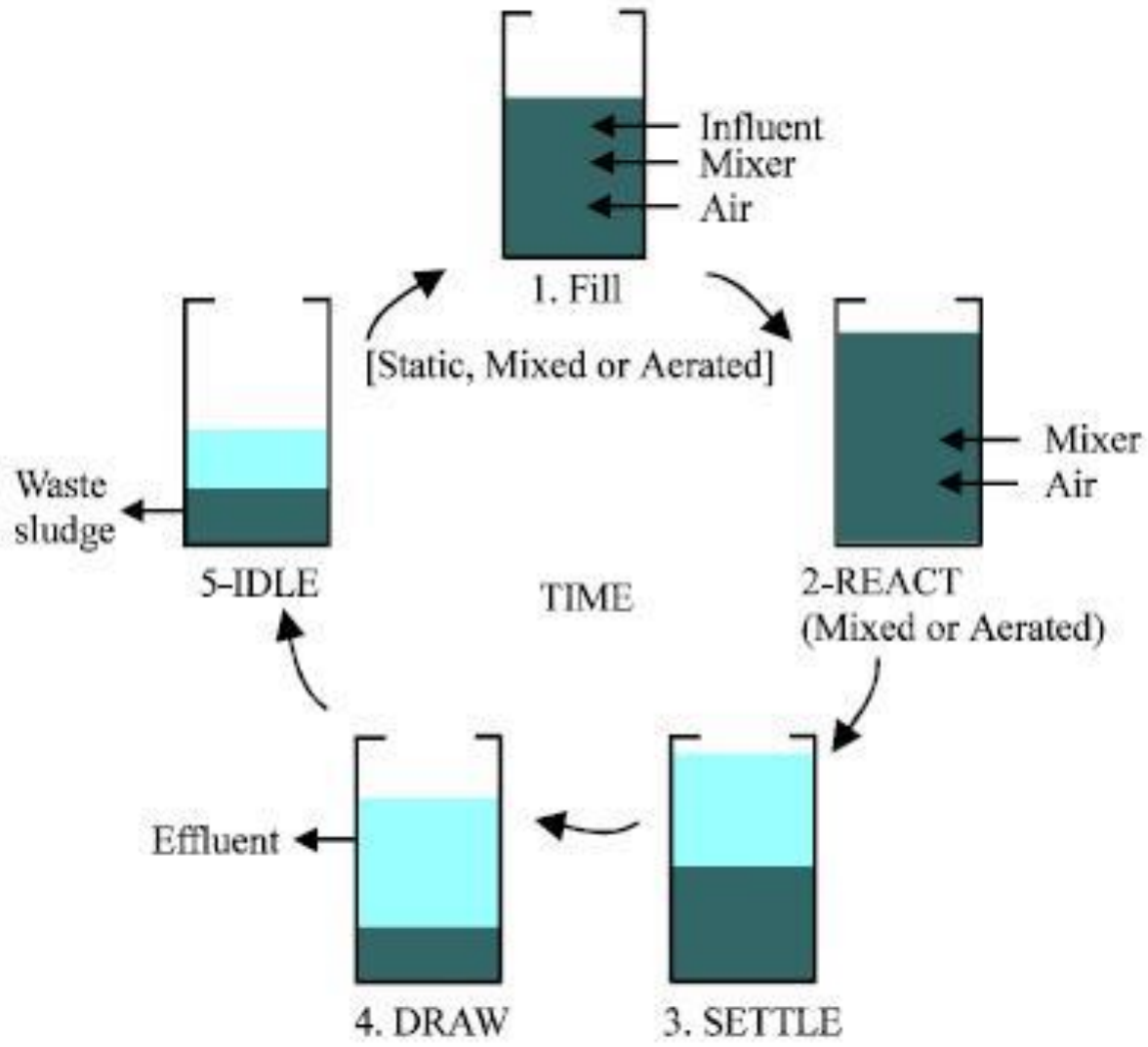

Figure 2-11: Basis of SBR Process

An assessment into the characteristics of Sequencing Batch Reactors was undertaken by Kim (2011:1-2) and displays the pros and cons of such treatment methods is listed below:

Advantages of SBRs

• *Equalization, primary clarification, biological treatment, and secondary clarification can be achieved in a*
single reactor vessel.
• *Operating flexibility and control.*
• *Minimal footprint.*
• *Potential capital cost savings by eliminating clarifiers and other equipment.*

Disadvantages of SBRs

• A higher level of sophistication is required especially for larger systems, of timing units and controls.

• Higher level of maintenance associated with more sophisticated controls, automated switches, and automated valves.

• Potential of discharging floating or settled sludge during the DRAW or decant phase with some SBR configurations.

• Potential plugging of aeration devices during selected operating cycles, depending on the aeration system used by the manufacturer.

• Potential requirement for equalization after the SBR, depending on the downstream processes.

Further advantages for the SBR process is the institutional knowledge in place at BRMO from previous exposure to SBR as the main method of wastewater treatment.

2.5.3 INTEGRATED FIXED-FILM ACTIVATED SLUDGE (IFAS)

A third technological alternative Integrated Fixed-Film Activated Sludge (IFAS) has also been included to broaden the methods being proposed. The basis of the method is outlined within Figure 2-12.

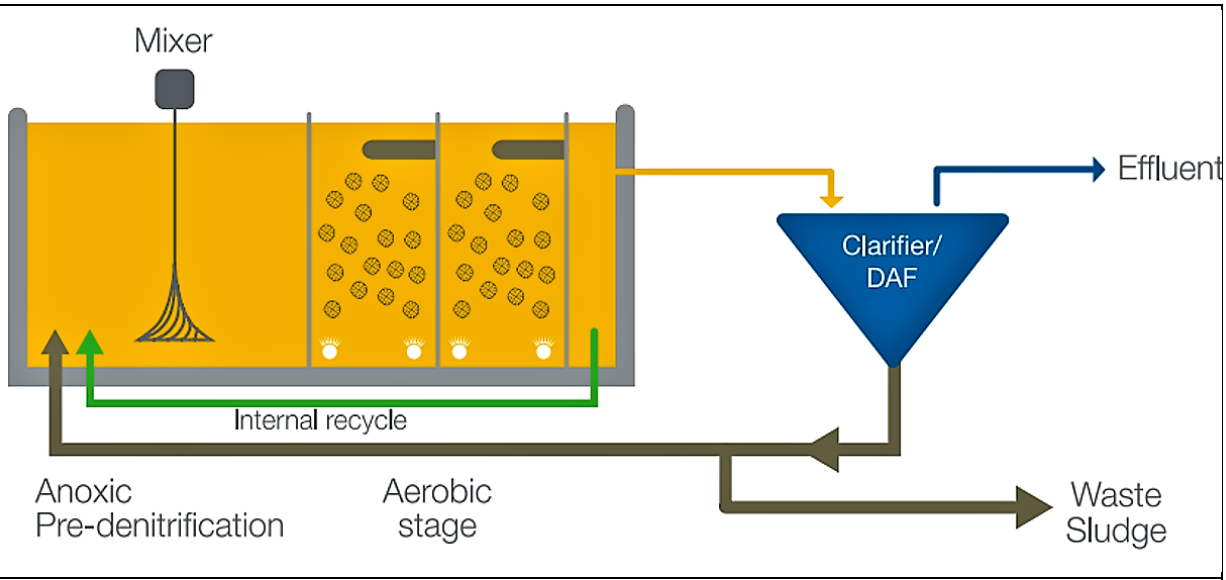

Figure 2-12: Basis of Integrated Fixed-Film Activated Sludge (IFAS) (https://sswm.info/water-nutrient-cycle/wastewater-treatment/hardwares/semi-centralised-wastewater-treatments/fixed-film-activated-sludge)

Advantages

- Fixed biomass combines anaerobic, aerobic and anoxic conditions whilst increasing sludge retention time, thus enabling better nitrification compared to suspended growth systems.
- Large percentage of nitrifiers retained on fixed film
- Improved process stability
- Improved Sludge Volume Index (SVI)
- Reduced Sludge Production

Disadvantages

- Energy intensive

- Lack of spare parts
- High CAPEX and OPEX
- Requires expert knowledge

2.6 NO-GO ALTERNATIVE

The no-go option refers to the alternative of the proposed development not going ahead at all. The baseline status quo is maintained in this case. This would mean the continued use of the existing wastewater treatment plants. The no-go alternative, in this instance, is a not seen as a viable alternative for continuation of the mine. However, the impact thereof will be assessed as require by the EIA regulations.

In order for the mine to continue operating, allow for the authorised expansions at Gloria to take effect, BRMO will likely be required to increase their wastewater treatment capacity as it is currently. In terms of assessing the No-Go alternative, this would consist of the continued operations of existing facilities at BRMO and will detrimentally impact on BRMO's ability to implement the authorised expansions effectively and further impact on the ability to expand on the current contributions to GDP and employment within the country.

3 NEED AND DESIRABILITY

The need and desirability of the proposed development is deemed to be integrally linked with the ultimate need and desirability of the greater BRMO; where the activities being applied for are supportive of the continued mining operations undertaken. The operation of the mine will continue to contribute towards the fiscus and employment within the area. The activities need and desirability thus lies in ensuring that the BRMO functions as an effective economic entity and thus contributes positively to continued employment in the region and contribution to the National GDP.

The proposed activities benefit to the local communities is twofold, firstly through increasing available wastewater capacity to both the mine and surrounding landowners reliant on existing wastewater infrastructure, and second by expanding on available water supply through the implementation of a reverse osmosis plant to reduce demand on water supply from the Vaal-Gamagara water transfer scheme. Additionally, these activities indirectly benefit society and surrounding communities indirectly through ensuring the efficient and effective functioning of the BRMO, such that the continued employment opportunities and contribution to National GDP that BRMO offers are realised.

Limited short term and medium term (6 months -18 months) employment would be created during the construction phase of the project for members of the local community (as permitted by local skills availability).

The proposed facilities will be located within BRMO's existing boundaries. Although there will be transformation of undisturbed land, this will occur within mining right area, and is expansion of existing operations.

The ecological sustainability of the proposed development will be assessed in the EIA phase and must be assured through the provisions of the Environmental Management Programme that will be developed based on the findings and recommendations of the EAP, the specialists' assessments, and the input of stakeholders and authorities.

3.1 MUNICIPAL SPATIAL DEVELOPMENT FRAMEWORK

BRMO is located within the Gamagara Mining Corridor as identified in the John Taolo Gaetswe spatial development framework (SDF). According to the SDF the Gamagara Mining Corridor that is currently loosely demarcated as an area stretching from Danielskuil and Postmasburg in the south to Hotazel and Moshaweng in the north, was identified as the area where a lack of infrastructure provision is causing serious constraints in the growth of the mining industry as well as limiting the economic development of the area.

The Gamagara Development Corridor is part of the Strategic Integrated Projects (SIPs). The SIPs are a product of the National Infrastructure Projects (NIP). The NIP was initiated to provide a background on cabinet's decision to establish a body to integrate and coordinate the long-term infrastructure build known as the Presidential Infrastructure Coordinating Council (PICC). The PICC presents the spatial mapping of infrastructure gaps, which analyses future population growth, projected economic growth, and areas of the country, which are not served with water, electricity, roads, sanitation and communication.

Based on this work, eighteen (18) Strategic Integrated Projects (SIPs) have been developed and approved to support economic development and address service delivery in the poorest provinces.

The Gamagara Development Corridor constitutes the SIP 3 (South-Eastern node & corridor development – Increase manganese rail capacity in the Northern Cape and SIP 5 (Saldanha-Northern Cape development corridor - Expansion of iron ore mining production and beneficiation).

It is therefore clear that the sustainable operation and expansion of the BRMO's activities are desirable in terms of both the municipal SDF as well as the national SIPs. The proposed Centralised STP development is integral to the continued operation and increasing production capacity of the all Black Rock Mining Operations.

4 POLICY AND LEGISLATIVE CONTEXT

This section summarises relevant environmental legislation applicable to the proposed centralised WWTP in respect of anticipated environmental permitting requirements. This is not a complete review of the applicable environmental legislation but rather a synopsis of those which are crucial to the Environmental Authorisation process and the assessments required thereto.

4.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act (NEMA), 1998 (Act 107 of 1998, as amended) is South Africa's overarching environmental legislation, and contains a comprehensive legal framework to give effect to the environmental rights contained in section 24 of The Constitution. Section 2 of NEMA contains environmental principles that form the legislated foundation for sustainable environmental management in South Africa.

4.1.1 DUTY OF CARE

NEMA places a Duty of Care on all persons who may cause significant pollution or degradation of the environment. Specifically, Section 28 of the act requires that every person who may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

4.1.2 EIA & ENVIRONMENTAL AUTHORISATION

NEMA introduces the principle of integrated environmental management that is achieved through the environmental assessment process in Section 24, which stipulates that certain identified activities may not commence without an Environmental Authorisation from the competent authority, in this case. Section 24(1) of NEMA requires applicants to consider, investigate, assess and report the potential environmental impact of these activities. The requirements for the investigation, assessment and communicating of potential environmental impacts are contained in the so-called EIA regulations (currently GN. R 982:2014 amended by GN. R 326:2017).

The Regulations identify specific activities that are either subject to a Basic Assessment process, or Scoping and EIA process (GN R. 983, GN R. 984 and GN R. 985; 4 December 2014, as amended). The listed activities potentially relevant to the proposed development are presented in Table 4-1.

Table 4-1: NEMA Listed Activities
GN.R 983 – Listing Notice 1, as amended
Activity No. 10: The development and related operation of infrastructure exceeding 1 000 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 the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area. **REASON**: Infrastructure will be required for transport of effluent and process water between the different mines and the centralised facility.
Activity No. 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; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is— (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development. **REASON**: New developments might require electrical transmissions.
Activity No. 14: The development and related operation 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. **REASON**: Potential construction of facilities for the storage of more than 80 cubic metres of dangerous goods such as diesel, oils, blasting emulsions, and other bulk chemical storage.
Activity No. 16: The development and related operation of facilities for the desalination of water with a design capacity to produce more than 100 cubic metres of treated water per day. **REASON**: The STP will include a water treatment plant which will include a Reverse Osmosis Plant to reduce the salinity of the treated effluent. The reverse osmosis plant will treat 58 cubes of waste per hour.
Activity No. 24: The development of a road— (i) 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; or

Table 4-1: NEMA Listed Activities
(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road— (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter. REASON: The Centralised facility will require an access road, as well as a service road around the site for maintenance.
Activity No. 25: The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres. **REASON**: The proposed centralised wastewater treatment facility will exceed the 2000m^3 treatment capacity threshold.
Activity No. 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. **REASON**: Clearance of at least 7.2ha is required for the centralised system.
Activity No. 31: The decommissioning of existing facilities, structures or infrastructure for— (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (ii) any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (iii) any development and related operation activity or activities and expansion and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (iv) any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or (v) any activity regardless the time the activity was commenced with, where such activity: (a) is similarly listed to an activity in (i) or (ii) above; and (b) is still in operation or development is still in progress; excluding where— (aa) activity 22 of this notice applies; or (bb) the decommissioning is covered by part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies. **REASON**: The existing waste water treatment works at Gloria, Nchwaning II and Black Rock mine will require decommissioning.
Activity No. 34: The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence

Table 4-1: NEMA Listed Activities
or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding— (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or (iii) the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic meters or less per day. **REASON**: The development of a new water reservoir for storage of water prior to irrigation and the new proposed irrigation activities will require an amendment of the existing water use licence.
GN.R 984:2014 – Listing Notice 2, as amended
Activity No. 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. **REASON**: Potential construction of facilities will require the clearance of approximately 140.1 hectares.
Activity No. 27: The development of a road— (i) ……. (ii) ……. (iii) with a reserve wider than 30 metres; or (iv) catering for more than one lane of traffic in both directions; but excluding a road— (a) 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; (b) which is 1 kilometre or shorter; or (c) where the entire road falls within an urban area. **REASON**: Potential construction of roads with a reserve wider than 30m, although based on anticipated locations, this activity is unlikely.
GN.R 985:2014 – Listing Notice 3, as amended
none

Section 24(1) of NEMA requires applicants to consider, investigate, assess and report the potential environmental impact of these activities. These apply to a Waste Management Licence (WML) application process as well. The requirements of an environmental impact assessment are contained in the so-called NEMA EIA regulations, GN.R 982 of 14 December 2014 (as amended).

Listing notice 2 activities require a scoping and environmental impact assessment process to be undertaken. The process is illustrated in Figure 9-1

4.2 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT 59 OF 2008)

4.2.1 RELEVANT DEFINITIONS

The NEM:WA defines '**Waste**' as

"*(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or*

(b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-

- *(i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;*
- *(ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered;*
- *(iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste; or,*
- *(iv) where the Minister has, in the prescribed manner, excluded any waste stream or a portion of a waste stream from the definition of waste.*".

other relevant definitions given in NEMWA for disposal, treatment and storage:

"***disposal***" *means the burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land*

"***treatment***" *means any method, technique or process that is designed to-*

a) change the physical, biological or chemical character or composition of a waste; or
b) remove, separate, concentrate or recover a hazardous or toxic component of a waste; or
c) destroy or reduce the toxicity of a waste.

in order to minimise the impact of the waste on the environment prior to further use or disposal

"***storage***" *means the accumulation of waste in a manner that does not constitute treatment or disposal of that waste*

4.2.2 WASTE MANAGEMENT LICENCING

According to section 19(1) and 19(3) of the NEM:WA, the Minister may publish a list of waste management activities that have, or are likely to have, a detrimental effect on the environment and must specify whether a waste management licence is required to conduct these activities. Under these provisions, a list of 'Category A', 'Category B' and 'Category C' waste management activities were published via General Notice No: 921 on 29 November 2013 as Schedule 1 to NEM:WA. Category

A and B activities require a Waste Management Licence in terms of section 20(b) of NEM:WA, whereas Category C activities require that the person conducting these activities complies with the relevant requirements or standards as stated in GN.R 921.

In terms of this notice, a person who wishes to commence, undertake or conduct any of these listed activities must, as part of the Waste Management Licence application, conduct either a Basic Assessment process (for Category A activities), or a scoping and EIA (for Category B activities) as stipulated in the NEMA EIA Regulations.

The waste management activities that are potentially applicable to the proposed plant are detailed in Table 4-2.

Table 4-2: NEM:WA Listed Waste Management Activities as per GN 921:2013	
Applicable 'Category A' Activities:	
none	
Applicable 'Category B' (Scoping & EIA) Activities	
Activity (4)	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage. Reason: The brine evaporation ponds are considered treatment of hazardous waste.
Activity (10)	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).

Due to the fact that Category B waste management activities are triggered, a Scoping and EIA process is applicable. The process is illustrated in Figure 9-1.

4.2.3 NATIONAL NORMS AND STANDARDS FOR THE ASSESSMENT OF WASTE FOR LANDFILL DISPOSAL

The National Norms and Standards for the Assessment of Waste for Landfill Disposal published in GN 635 of 2013, prescribe the requirements for the assessment of waste prior to disposal to landfill. GN 635 requires that all wastes that are to be disposed of in landfills be assessed in terms of their composition and leaching properties. The total concentrations and leachable concentrations of specified analytes are used to assess the waste. These values are then compared to threshold values to determine the waste "type". The complete list of compounds that are to be assessed under these regulations is given in Table 4-3, along with the applicable leachable concentrations thresholds (LCT) and total concentration thresholds (TCT), used to define the waste type.

Table 4-3: Total Concentration thresholds and Leachable Concentration Thresholds

Elements & Chemical Substances in Waste	**Total Concentration Threshold (TCT) Limits (mg/kg)**			**Leachable Concentration Threshold (LCT) Limits (mg/l)**			
	TCT0	**TCT1**	**TCT2**	**LCTO**	**LCT1**	**LCT2**	**LCT3**
Metal Ions							

Table 4-3: Total Concentration thresholds and Leachable Concentration Thresholds

Elements & Chemical Substances in Waste	Total Concentration Threshold (TCT) Limits (mg/kg)			Leachable Concentration Threshold (LCT) Limits (mg/l)			
	TCT0	TCT1	TCT2	LCTO	LCT1	LCT2	LCT3
Arsenic (As)	5.8	500	2000	0.01	0.5	1	4
Boron (B)	150	15 000	60000	0.5	25	50	200
Barium (Ba)	62.5	6250	25000	0.7	35	70	280
Cadmium (Cd)	7.5	260	1040	0.003	0.15	0.3	1.2
Cobalt (Co)	50	5000	20000	0.5	25	50	200
Total Chromium (Cr)	46000	800000	N/A	0.1	5	10	40
Hexavalent Chromium (Cr(VI))	6.5	500	2000	0.05	2.5	5	20
Copper (Cu)	16	19500	78000	2	100	200	800
Mercury (Hg)	0.93	160	640	0.006	0.3	0.6	2.4
Manganese (Mn)	1000	25000	100000	0.5	25	50	200
Molybdenum (Mo)	40	1000	4000	0.07	3.5	7	28
Nickel (Ni)	91	10600	42400	0.07	3.5	7	28
Lead (Pb)	20	1900	7600	0.01	0.5	1	4
Antimony (Sb)	10	75	300	0.02	1	2	8
Selenium (Se)	10	50	200	0.01	0.5	1	4
Vanadium (V)	150	2680	10720	0.2	10	20	80
Zinc (Zn)	240	160000	640000	5	250	500	2000
Inorganic Anions							
TDS				1000	12500	25000	100000
Chloride				300	15000	30000	120000
Sulphate				250	12500	25000	100000
NO3 as Nitrate (N)				11	550	1100	4400
F Fluoride	100	10000	40000	1.5	75	150	600
CN Cyanide Total	14	10500	42000	0.07	3.5	7	28
Organics							
Benzene		10	40		0.01	0.02	0.08
Benzo(a)pyrene		1.7	6.8		0.035	0.07	0.28
Carbon tetrachloride		4	16		0.2	0.4	1.6
Chlorobenzene		8800	35200		5	10	40
Chloroform		700	2800		15	30	120
2-Chlorophenol		2100	8400		15	30	120
Di (2 ethylhexyl) phthalate		40	160		0.5	1	4
1,2-Dichlorobenzene		31900	127600		5	10	40
1,4-Dichlorobenzene		18400	73600		15	30	120
1,2-Dichloroethane		3.7	14.8		1.5	3	12

Table 4-3: Total Concentration thresholds and Leachable Concentration Thresholds

Elements & Chemical Substances in Waste	Total Concentration Threshold (TCT) Limits (mg/kg)			Leachable Concentration Threshold (LCT) Limits (mg/l)			
	TCT0	TCT1	TCT2	LCTO	LCT1	LCT2	LCT3
1,1-Dichloroethylene		150	600		0.35	0.7	2.8
1-2-Dichloroethylene		3750	15000		5	20	
Dichloromethane		16	64		0.5	2	
2,4-Dichlorophenol		800	3200		10	20	80
2,4-Dinitrotoluene		5.2	20.8		0.065	0.13	0.52
Ethylbenzene		540	2160		3.5	7	28
Formaldehyde		2000	8000		25	50	200
Hexachlorobutadiene		2.8	5.4		0.03	0.06	0.24
Methyl ethyl ketone		8000	32000		100	200	800
MTBE (Methyl t-butyl ether)		1435	5740		2.5	5	20
Nitrobenzene		45	180		1	2	8
PAHs (total)		50	200		N/A	N/A	N/A
C6 to C 9 Petroleum H/Cs		650	2600		N/A	N/A	N/A
C10 to C 36 Petroleum H/Cs		10000	40000		N/A	N/A	N/A
Phenols (total, non-halogenated)		560	2240		7	14	56
Polychlorinated biphenyls		12	48		0.025	0.05	0.2
Styrene		120	480		1	2	8
1,1,1,2-Tetrachloroethane		400	1600		5	10	40
1,1,2,2-Tetrachloroethane		5	20		0.65	1.3	5.3
Tetrachloroethylene		200	800		0.25	0.5	2
Toluene		1150	4600		35	70	280
Trichlorobenzenes (total)		3300	13200		3.5	7	28
1,1,1-Trichloroethane		1200	4800		15	30	120
1,1,2-Trichloroethane		48	192		0.6	1	4
Trichloroethylene		11600	46400		0.25	2	8
2,4,6-Trichlorophenol		1770	7080		10	20	80
Vinyl chloride		1.5	6		0.015	0.03	0.12
Xylenes (total)		890	3560		25	50	200
Pesticides							
Aldrin + Dieldrin	0.05	1.2	4.8		0.015	0.03	0.03
DDT + DDD + DDE	0.05	50	200		1	2	2
2,4-D	0.05	120	480		1.5	3	3
Chlordane	0.05	4	16		0.05	0.1	0.1
Heptachlor	0.05	1.2	4.8		0.015	0.03	0.03

Notably, Type 4 wastes have additional concentration limits that should not be exceeded as presented in Table 4-4.

Table 4-4: Additional concentration limits applicable to Type 4 wastes

Chemical Substance	**Concentration (mg/kg)**
TOC	30 000 (3%)
BTEX	6
PCBS	1
Mineral oil (C10 to C40)	500
Pesticides	
Aldrin + Dieldrin	0.05
DDt + DDD + DDE	0.05
2,4-D	0.05
Chlorodane	0.05
Heptachlor	0.05

There are five waste types, numerically ordered from type 0 to type 4. Type 0 waste being most hazardous in respect of landfilling, and type 4 being the least hazardous. The waste types are determined as shown in Table 4-5.

Table 4-5: Waste type classification of waste according to concentration thresholds from the national norms and standards (GN 635 of 2013)		
Leachable Concentration	**Total Concentration**	**Waste Type**
LC ≤ LCT0	TC ≤ TCT0	Type 4[#]
LCT0 < LC ≤ LCT1	TC ≤ TCT1	Type 3
LCT1 < LC ≤ LCT2	TC ≤ TCT1	Type 2
LCT2 < LC ≤ LCT3	TCT1 < TC ≤ TCT2	Type 1
LCT3 < LC	TCT2 < TC	Type 0

Furthermore, Waste Disposal restrictions are listed within the National Norms and Standards for Disposal of waste to landfill. One such waste that is restricted from being disposed of is Brine. The criteria for the disposal is outlined within Table 4-6.

Table 4-6: Waste disposal restrictions from the national norms and standards (GN 635 of 2013)	
Waste prohibited or restricted in terms of disposal	**Compliance Timeframe and effective date of implementation**
Brine or waste with a high salt content (TDS>5%), and a leachable concentration for TDS of more than 100 000mg/l.	Eight (8) years – 23rd August 2021

4.2.3.1 Waste Acceptance Criteria for Disposal to Landfill

The waste types determine the class of landfill to which they may be disposed. The National Norms and Standards for Disposal of Waste to Landfill gazetted in GN 636 of 2013 stipulate the applicable classes as presented in Table 4-7.

Table 4-7: Landfill requirements based on waste type (per GN 636 of 2013)	
Waste type	**Landfill requirements**
Type 0	The disposal of Type 0 waste to landfill is not allowed. The waste must be treated and re-assessed in terms of the Norms and Standards for Assessment of Waste for Landfill Disposal.
Type 1	Type 1 waste may only be disposed of at a Class A landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a Hh/HH landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., Department of Water Affairs and Forestry, 1998).
Type 2	Type 2 waste may only be disposed of at a Class B landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).
Type 3	Type 3 waste may only be disposed of at a Class C landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB+ landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).

Table 4-7: Landfill requirements based on waste type (per GN 636 of 2013)	
Waste type	**Landfill requirements**
Type 4	Type 4 waste may only be disposed of at a Class D landfill designed in accordance with section 3(1) and (2) of these Norms and Standards, or, subject to section 3(4) of these Norms and Standards, may be disposed of at a landfill site designed in accordance with the requirements for a GLB landfill as specified in the Minimum Requirements for Waste Disposal by Landfill (2nd Ed., DWAF, 1998).

4.3 THE NATIONAL WATER ACT (NWA), 1998 (ACT 36 OF 1998)

The National Water Act (NWA), 1998 (Act 36 of 1998), aims to manage national water resources in order to achieve sustainable use of water for the benefit of all water users. This requires that the quality of water resources is protected, and integrated management of water resources takes place.

4.3.1 WATER USE LICENCE

In terms of the National Water Act, Act No. 36 of 1998 (NWA) a water use licence is required for:

(a) taking water from a water resource;

(b) storing water;

(c) impeding or diverting the flow of water in a watercourse;

(d) engaging in a stream flow reduction activity contemplated in section 36;

(e) engaging in a controlled activity identified as such in section 37 (1) or declared under section 38 (1);

(f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;

(g) disposing of waste in a manner which may detrimentally impact on a water resource;

(h) disposing in any manner of water which contains waste from, or which has been heated in, any industrial or power generation process;

(i) altering the bed, banks, course or characteristics of a watercourse;

(j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and

(k) using water for recreational purposes.

The relevant water uses for the proposed treatment plant are:

- 21(a) taking water from a water resource;
- 21(e) – Controlled activities:
    - 37. (1). (a) irrigation of any land with waste or water containing waste generated though any industrial activity or by a waterwork;

- 21 (f) discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
- 21 (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- 21 (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people;

Other provisions of the NWA have been taken into account, specifically relating to Part 4 (Section 19), which deals with pollution prevention, in particular situations where pollution of a water resource occurs or might occur as a result of activities on land. A person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. If these measures are not taken, the catchment management agency concerned may itself do whatever is necessary to prevent the pollution or to remedy its effects, and to recover all reasonable costs from the persons responsible for the pollution.

4.3.2 GN. R. 704 – REGULATION OF MINE WATER MANAGEMENT

Regulation 704 of 4 June 1999 was promulgated under the NWA with the primary goal of ensuring water resource protection from poorly effected mine water management. The requirements of GN.R. 704 must be seen as the minimum requirements to fulfil the above stated goal and apply to BRMO's activities.

4.4 BIODIVERSITY

Legislation of potential significance to BRMO's operations includes:

- National Forests Act (Act No. 84 of 1998)
- Conservation of Agricultural Resources Act (Act 43 of 1983)
- National Environmental Management: Biodiversity Act (Act 10 of 2004)
- Northern Cape Nature Conservation Act (Act 109 of 2009)

The proposed developments will largely within the Black Rock mine boundary, adjacent to the existing facilities, most of these areas have been partially disturbed natural vegetation. Consequently, the potential for biodiversity impacts and the regulation thereof of are of significance to the proposed upgrades. However, BRMO will obtain the relevant permits to relocate any sensitive vegetation located within the multiple areas of concern.

4.4.1 NATIONAL FORESTS ACT (ACT NO. 84 OF 1998)

There are a number of tree species that are protected according to Government Notice no. 1012 under section 12(I)(d) of the National Forests Act, 1998 (Act No. 84 of 1998). In terms of section1 5(1) of the National Forests Act, 1998 "*no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell donate or in any other manner acquire or dispose of any protected tree or any forest product derived from a protected tree, except under a license granted by the Minister to an (applicant and subject to such period and conditions as may be stipulated)*".

The occurrence of two such protected tree species such as camel thorn (Vachellia erioloba) and grey camel thorn (Vachellia haematoxylon) has been confirmed at BRMO. Permits for the removal of relevant species will be applied for where applicable.

4.4.2 CONSERVATION OF AGRICULTURAL RESOURCES ACT (ACT 43 OF 1983)

As per the Conservation of Agricultural Resources Act (CARA) (Act 43 of 1983), Conservation is defined as: "*in relation to the natural agricultural resources, includes the protection, recovery and reclamation of those resources*;"

The objectives of the CARA, as stated in section 2 of the Act, entitled "Objects of Act", are:

"*The objects of this Act are to provide for the conservation of the natural agricultural resources of the Republic by the maintenance of the production potential of land, by the combating and prevention of erosion and weakening or destruction of the water sources, and by the protection of the vegetation and the combating of weeds and invader plants*."

The proposed development must meet these objectives as far as practicably possible. Of most significance to the project are the provisions stated in Regulation 5 of the Act for the "Prohibition of spreading weeds", which states that:

No person shall-
(a) sell, agree to sell or offer, advertise, keep, exhibit, transmit, send, convey or deliver for sale, or exchange for anything or dispose of to any person in any manner for a consideration, any weed; or
(b) in any other manner whatsoever disperse or cause or permit the dispersal of any weed from any place in the Republic to any other place in the Republic.

4.4.3 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT (ACT 10 OF 2004)

The National Environmental Management: Biodiversity Act (Act 10 Of 2004) (NEMBA) is the primary legislation governing biodiversity management in South Africa.

Section 2: "Objectives of the Act", states the following:

2. The objectives of this Act are-
a) within the framework of the National Environmental Management Act, to provide for-
(i) the management and conservation of biological diversity within the Republic and of the components of such biological diversity.
(ii) the use of indigenous biological resources in a sustainable manner; and
(iii) the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources;
b) to give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
c) to provide for co-operative governance in biodiversity management and conservation; and
d) to provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

Chapter 5 of NEMBA regulates activities involving invasive species, and lists duty of care as follows:

- The landowner/land user must take steps to control and eradicate the invasive species and prevent their spread, which includes targeting offspring, propagating material and regrowth, in order to prevent the production of offspring, formation of seed, regeneration or reestablishment;
- Take all required steps to prevent or minimise harm to biodiversity; and
- Ensure that actions taken to control/eradicate invasive species must be executed with caution and in a manner that may cause the least possible harm to biodiversity and damage to the environment.

An amendment to the NEMBA has been promulgated, which lists 225 threatened ecosystems based on vegetation types present within these ecosystems. Should a project fall within a vegetation type or ecosystem that is listed, actions in terms of NEMBA are triggered. Based on the preliminary sensitivity screening undertaken for the proposed site, none of the threatened ecosystems occur within the study area.

4.4.4 NORTHERN CAPE NATURE CONSERVATION ACT (ACT 109 OF 2009)

The Northern Cape Nature Conservation Act (Act 109 of 2009) {NCNCA} for the sustainable utilisation of wild animals, aquatic biota, and plants as well as permitting and trade regulations regarding wild fauna and flora within the province.

The NCNCA makes provision for Specially Protected and Protected species of fauna and flora. According to Section 49 of the Act:

(1) No person may, without a permit -
(a) pick;
(b) import;
(c) export;
(d) transport;
(e) possess;
(f) cultivate; or
(g) trade in,
a specimen of a specially protected plant.

(2) The provisions of subsection (1) (e), in so far as they prohibit the possession of a specially protected plant, do not apply to a landowner who is in possession of a specially protected plant which grows in its natural habitat and which was not planted by human interference.

"protected plant" means a species of plant listed as such in Schedule 2. There various protected species listed in schedule 2 of the Act that apply to the site. These include for example Harpagophytum procumbens (devil's claw) and Boophone disticha (Candelabra Flower). Permits for the removal, or relocation and transport, of relevant species will be applied for where applicable.

4.5 NATIONAL HERITAGE RESOURCES ACT (NHRA) (ACT 25 OF 1999)

The NHRA aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations.

The Act protects as cultural heritage resources such as:

a. Archaeological artefacts, rock structures, structures and sites older than 100 years;
b. Ethnographic art objects (e.g. prehistoric rock art) and ethnography;
c. Objects of decorative and visual arts;
d. Military objects, structures and sites older than 75 years;
e. Historical objects, structures and sites older than 60 years;
f. Proclaimed heritage sites;
g. Grave yards and graves older than 60 years;
h. Meteorites and fossils; and
i. Objects, structures and sites or scientific or technological value.

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area of interest, in particular as per S38(1) any development categorised as:

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50m in length;

(c) any development or other activity which will change the character of a site -

(i) exceeding 5 000m2 in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or.

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000m^2 in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

Any person intending to undertake the above must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

The responsible heritage resources authority must, within 14 days of receipt of the notification indicate whether submit an impact assessment report and specify the information to be contained in the report.

The responsible heritage resources authority must then decide:
(a) whether or not the development may proceed;

(b) any limitations or conditions to be applied to the development;

(c) what general protections in terms of this Act apply, and what formal protections may be applied, to such heritage resources;

(d) whether compensatory action is required in respect of any heritage resources damaged or destroyed as a result of the development; and

(e) whether the appointment of specialists is required as a condition of approval of the proposal.

However, according S38(8) the above does not apply where environmental impact assessment is required, provided that the consenting authority must ensure that the evaluation fulfils the requirements of the relevant heritage resources authority in terms of subsection (3), and any comments and recommendations of the relevant heritage resources authority with regard to such development have been taken into account prior to the granting of the consent.

5 PUBLIC PARTICIPATION

5.1 INTRODUCTION

Public participation provides the opportunity for IAPs (interested or affected parties) to participate on an informed basis, and to ensure that their needs and concerns are considered during the impact assessment process. In so doing, a sense of ownership of the project is vested in both the project proponent and interested or affected parties. The Public Participation Process is aimed at achieving the following:

- Provide opportunities for IAPs and the authorities to obtain clear, accurate and understandable information about the expected environmental and socio-economic impacts of the proposed development.
- Disclose project information to allow stakeholders to understand all project implications, any potential risks and impacts, and any anticipated development opportunities to accrue from it;
- Disseminate information to stakeholders in a transparent, relevant, understandable and accessible format;
- Disclose project information in relevant local languages and in an accessible and culturally appropriate manner;
- Provide information responses addressing specific stakeholder interests that may be differently or disproportionately affected by the project;
- Establish a formal platform for the public with the opportunity to voice their concerns and to raise questions regarding the project.
- Utilise the opportunity to formulate ways for reducing or mitigating any negative impacts of the project, and for enhancing its benefits.
- Enable project proponent to consider the needs, preferences and values of IAPs in their decisions.
- Clear up any misunderstandings about technical issues, resolving disputes and reconciling conflicting interests.
- Provide a proactive indication of issues which may inhibit project progress resulting in delays, or which may result in enhanced and shared benefits.
- Ensure transparency and accountability in decision-making.

5.2 STAKEHOLDER NOTIFICATION

The public and stakeholder participation process to date has entailed the following:

- Advertising of the proposed activities and the associated S&EIR process in the the Noordkaap Bulletin on the 20th of May and in the Kathu Gazette on the 28th of May 2021 (Appendix 2.2: Newspaper Advertisements).
- Placement of site notices at the following places conspicuous to the public (Appendix 2.1: Site Notices):
    - BRMO main entrance
    - Entrance to Gloria Mine
    - Entrance to Nchwaning II
    - Black Rock Shopping Centre
    - Hotazel Shopping Centre
- Pre-identification and notification to Interested and Affected Parties based on the existing list of the mines registered IAPs including neighbouring landowners and occupiers, the ward councillor, the local municipality, the district municipality, the

provincial environmental authority, and other stakeholders (Appendix 2.3: Interested and Affected Parties List).

The following is to be conducted through the distribution of the Draft Scoping Report to registered interested and affected parties:

- Notification of Interested and Affected Parties, including neighbouring landowners and occupiers, the ward councillor, the local municipality, the district municipality, the provincial environmental authority, and other stakeholders.
- Distribution of draft Scoping Report to IAPs for comment.

The proposed public participation process for the remainder of the Environmental Impact Assessment process will consist of:

- Presenting registered Interested and Affected Parties and stakeholders with the opportunity to read and comment on environmental impact assessment report including specialist reports;
- Presenting registered Interested and Affected Parties and stakeholders with the opportunity to read and comment on draft environmental management plans compiled in terms of regulation;
- Public or focus group meetings to present and discuss the findings of the Environmental Impact Assessment and related specialist reports (if required or if enough interest)

6 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The description of the receiving environmental is described herein based on observations at the site and the findings of previous environmental impact assessments undertaken for the wider mine environmental management programme. Although this is sufficient for the scoping phase, further detail may be added and/or amended during the EIA phase.

The area of interest is adjacent to the existing surface activities of the mine, although some portions of the land have previously been disturbed the area largely consists of undisturbed land. The area is classified as having natural/indigenous vegetation. The site is ***not*** located on a shallow water table, dolomitic, sinkhole, or doline areas, seasonally wet soils, unstable rocky slopes or steep slopes with loose soil, dispersive soils, soils with high clay content and or an area sensitive to erosion.

6.1 PHYSICAL

6.1.1 CLIMATE

There are no South African Weather stations (SAWS) in the region. As such, data for Kuruman is used to provide an overview of the climatology of the area. Kuruman is approximately 65km southeast of the BRMO operations. The meteorological conditions at this site may not be exactly representative of meteorological conditions at the site, however they are expected to be representative of the general conditions of the region.

6.1.2 WIND

The observed wind direction and wind speed are dominantly from the north northwest with an average wind speed of 4.1m/s (for the windier months of the year, July to January) (Figure 6-1). The length of the colour-coded line in the wind roses is proportional to the frequency of occurrence of wind blowing from that direction. Wind speed classes are also colour coded and the length of each class/category is proportional to the frequency of occurrence of wind speed.

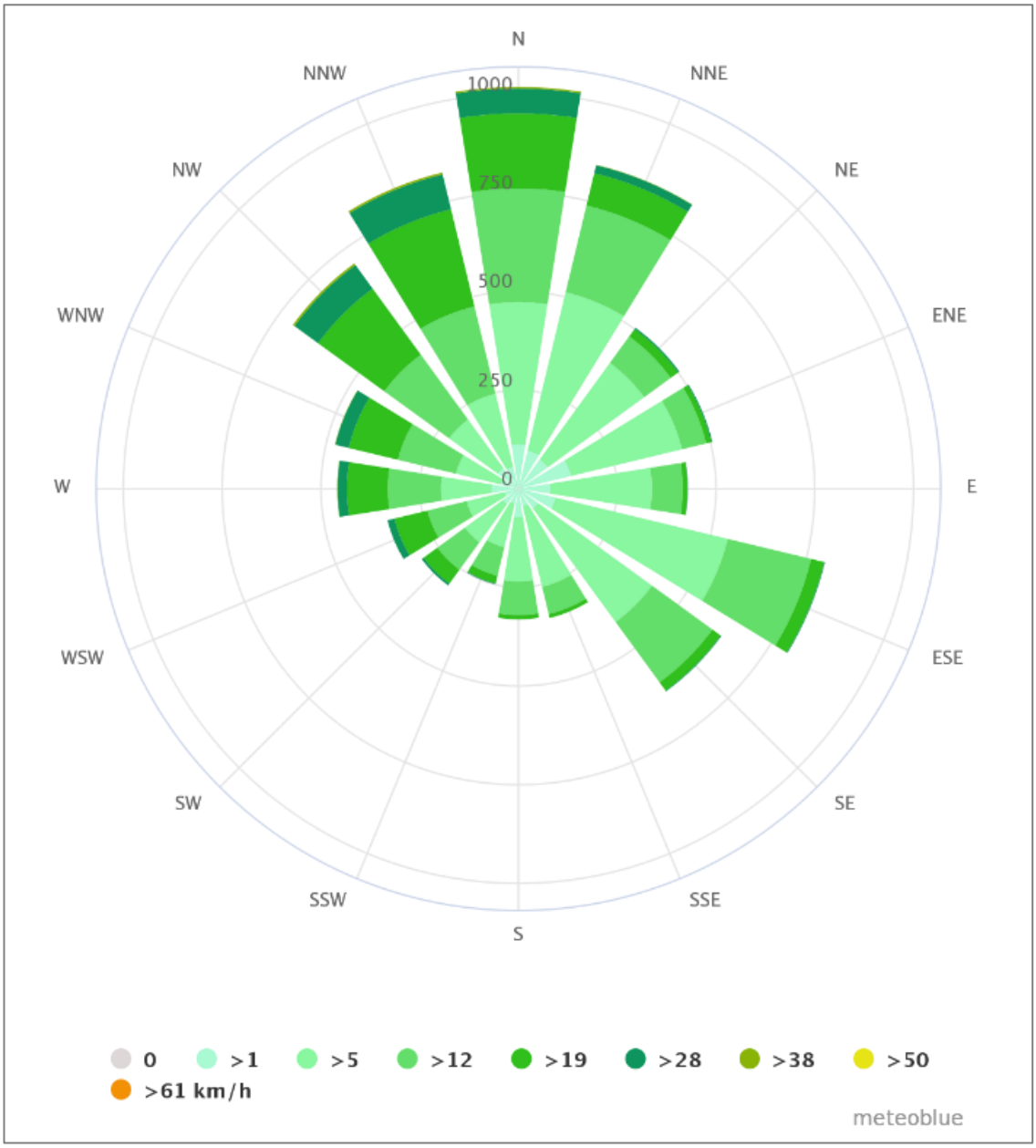

Figure 6-1: Annual wind rose for Kuruman (right) (https://www.meteoblue.com)

6.1.3 RAINFALL AND TEMPERATURE

Rainfall occurs predominantly in summer and autumn (Dec – Apr) while the least amount of rain falls in the months of winter (May – Sep). The maximum daily temperature occurs in January/December whilst the minimum daily temperature occurs in July/August for Kuruman. The maximum daily temperature occurs in January whilst the minimum daily temperature occurs in July/August (Figure 6-2). Temperatures are high in summer months, with and maximum temperature of around 32°C for Kuruman. Winter temperatures do drop below freezing, however the average minimum temperature for Kuruman is 1°C.

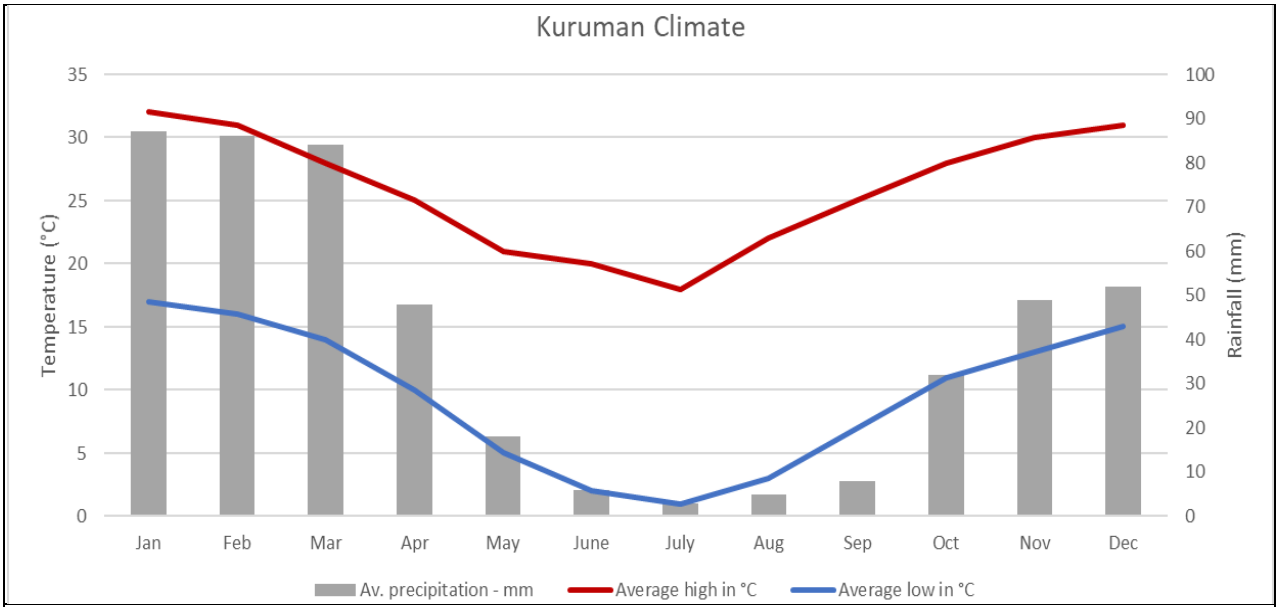

Figure 6-2: Monthly average temperature and rainfall for Kuruman (https://www.climatedata.eu)

6.1.4 EVAPORATION AND CLIMATIC WATER BALANCE

The region is arid with relatively high evaporation rates and low rainfall. Although site specific data is not available, the mean annual precipitation versus evaporation rates can be estimated from mean rates from other stations in the area. Average monthly rainfall and evaporation data for the area was obtained the following stations:

- Kuruman Station (D4E004), approximately 65 km south east.
- Olifantshoek station (D4E002), approximately 85 km north west.

The average monthly and annual data is summarised in Table 6-1.

Table 6-1: Precipitation and Evaporation Data

Month	Kuruman-D4E004		Olifantshoek-D4E002	
	Rainfall (mm)	Evaporation (mm)	Rainfall (mm)	Evaporation (mm)
January	26.4	236.3	19	234.9
Feb	45.1	243.6	27.4	266.6
March	44.9	272.7	32.7	293.2
April	85.6	259	59.6	276.1
May	82.9	208.4	52.1	221.6
June	86.5	161.3	63.3	191.9
July	45.1	122.3	33.4	139.8
August	21.5	113.2	14.1	105.3
September	7.4	82.5	5.3	79.8
October	2.8	99.1	3.2	90.7
November	9.8	131.2	5.5	132.6
December	7.9	188.5	5.8	180.3
Annual	**465.9**	**2118.1**	**321.4**	**2212.8**
Water Balance*	**-1652**		**-1891**	
* The climatic water balance is calculated as total rainfall - total evaporation.				

It is clear from the above that there is a significantly negative climatic water balance for the area. This is significant for the site as it implies that there is limited potential for rainwater infiltration and related leaching of material disposed, and significant potential for loss of water through evaporation.

6.1.5 SURFACE WATER AND WETLAND/RIPARIAN ZONES

The gradient of the site is flat, and the landform can be classified as a plain. (Refer to Figure 6-3). Notably the Gamagara river runs to the east of the site, however there are no apparent drainage channels to the river. The Gamagara River and its associated wetland/riparian features (including a 32 m buffer zone) can be considered as an ecologically sensitive area in relation to the proposed development activities. The proposed activities are located outside of this area, with the currently operational Gloria Sump being the closest point to the ecologically sensitive area of the Gamagara river located approximately 110m west of the Gamagara River 1:100 year flood line and approximately 285m from the Gamagara Riverbed.

According to a previous hydrological assessment undertaken at BRMO (African Environmental Development, report number AED0201/2011) site is located in the arid and endorheic Kalahari Basin, it does not have any true surface water, although there are a few areas, where quarries have intercepted the water table below a dry streambed and this water was considered to be surface water (with certain reservations).

The study further demonstrated that the area where the mine is located is very flat with low slopes and that in general, hardly any actual surface run-off would enter the Gamagara River. If, indeed surface run-off did reach the river, it would rapidly be absorbed by the riverbed and become part of the groundwater environment. Due to the endorheic nature of the Kalahari Basin, any contamination of groundwater would simply remain there for an extremely long time. This places an extended responsibility on BRMO and the other mines operating in this area, as negligent actions on the part of the mines, leading to contamination of groundwater could be responsible for this contamination lingering in the groundwater for potentially millions of years.

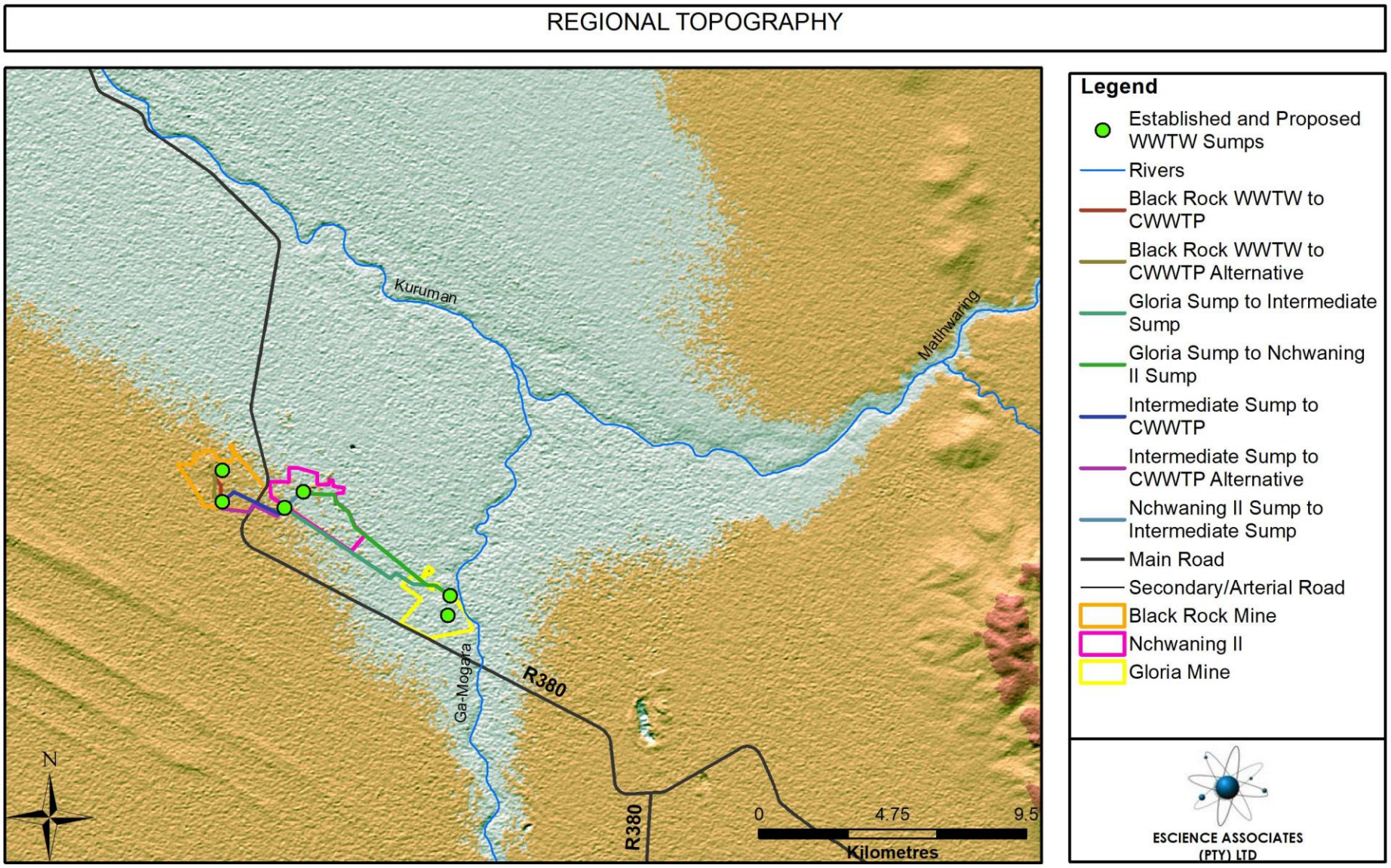

Figure 6-3: Regional topography displaying relatively flat nature of the region

6.1.6 GROUNDWATER

Various specialist hydrogeological assessments have been undertaken at BRMO. These include (Geo Pollution Technologies, Report Reference Number: EBR-10-320, Envass report GEO- REP-107-08-19)). The site is underlain by the Kalahari formation. This formation at BRMO consists of a top layer of aeolian sands followed by calcrete of tertiary age. If weathered, the calcareous sands have the favourable characteristics of porosity and permeability. There is limited surface runoff in the Kalahari area (high infiltration rates during precipitation). Due to high porosity and permeability of the Kalahari sands, the calcrete deposit below the top layer of Kalahari sands acts like a "sponge".

The arithmetic average depth of the water levels below surface in the boreholes found at BRMO is 69.6 mbgl with a maximum depth of 110 m below surface. If the depth of the Kalahari formation is considered with the water levels found in the hydrocensus it can be concluded that the farmers tap their water from this weathered/fractured calcrete aquifer. The average recharge values assigned to calcrete is ±10% of the mean annual precipitations. The water quality from the boreholes sampled is generally good. Considering the geology and hydro-geological characteristics of the site (i.e. the calcrete aquifer used by the surrounding farming communities, as well as boreholes visited during the hydrocensus and used for general farming), the aquifer should be regarded as "Major aquifer system", based on the following:

- Public supply and other purposes: The aquifer plays a major role in the livelihood of the farming community surrounding BRMO; and
- Water quality: The water quality is good.

The groundwater specialists deemed there to be a low risk for the users found in the hydrocensus to be impacted by either dewatering, or contaminated groundwater originating from the larger BRMO operations. The potential impact of the proposed development must however be assessed and the background hydrogeological status of the site based on updated data.

6.1.7 SOIL

A soil survey was previously been undertaken at BRMO to assess soil characteristics. Further this study looked establishing the following: how and to what depth topsoil should be removed; how the removed soil should be stored; and treated when reused to remediate the disturbed area after mine closure (Report: Soil Survey and Soil Management Program for the Black Rock Mine Operations Concerning Establishing A New Sinter Plant and Shaft Complex - Prof Claassens 2011). The area around Black Rock, in the vicinity where the mining operations are undertaken, consists mainly of Kalahari sand. Kalahari sand is typically homogenously very deep with the exception of certain areas which are under laid by calcrete. Soil fertility is low as is typical of sandy soils. Based on soil auguring undertaken the soils in the area surveyed were deep yellowish-red sandy soils.

Due to a very low organic content, it was concluded that no specific recommendation on how deep the topsoil should be excavated to prepare the area is necessary. Due to the texture of the soil and the size distribution it will not tend to compact while it is stockpiled thus no special arrangements are necessary for stockpiling.

Although the soil is not very fertile, the stockpiled soils can be used as such to reclaim the disturbed area at mine closure. No fertilizer programme is recommended because it is assumed that the disturbed areas will be re-vegetated with natural grasses which are adapted to the local environment.

6.2 BIOLOGICAL

As previously mentioned the area affected is currently adjacent to the existing surface activities of the mine, although some portions of the land have previously been disturbed the area largely consist of undisturbed land. The area is classified as having natural/indigenous vegetation.

The surrounding area as depicted by the threatened ecosystems database is shown in Figure 6-4. The entire area is described as "lightly threatened".

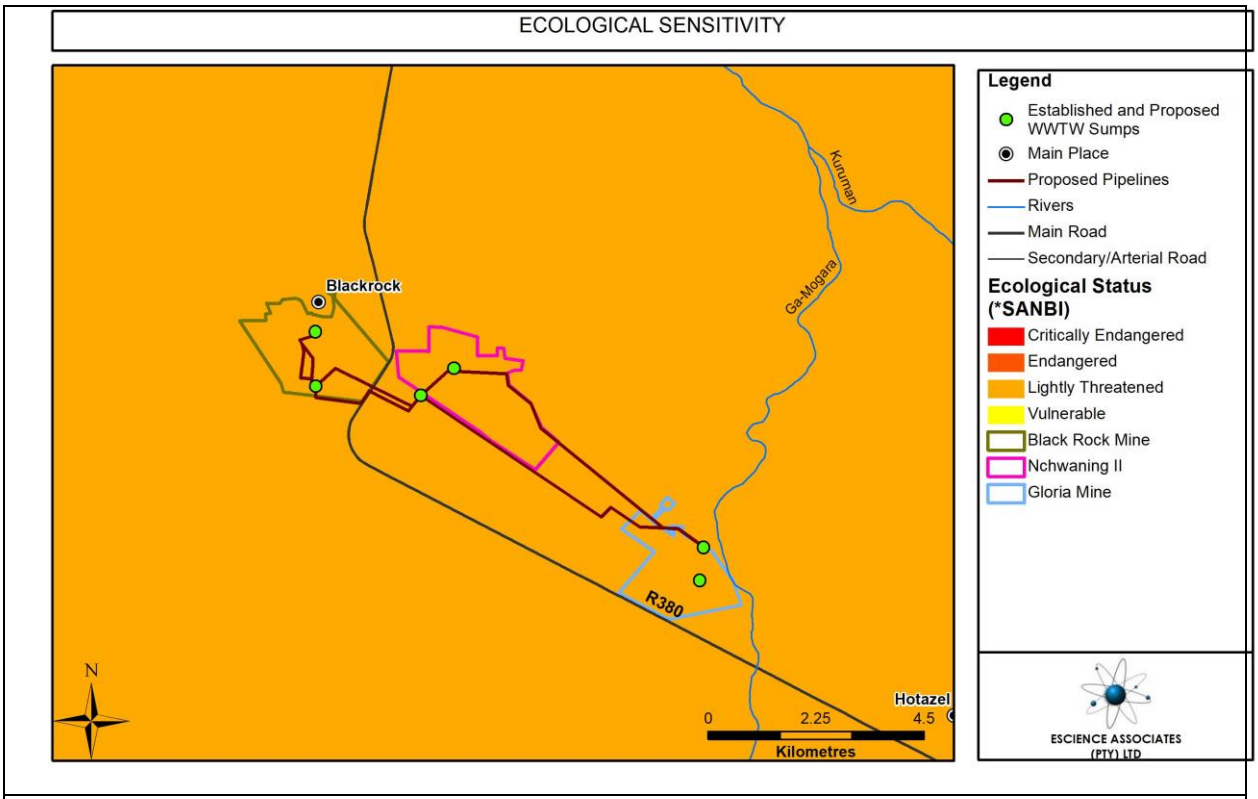

Figure 6-4: Map reflecting potential environmental sensitivities with the proposed activities.

Based on the findings of previous assessments (Biodiversity Action Plan For The Assmang Black Rock Manganese Ore Mine authored by SAS Environmental, 2011, Report Reference № SAS 211022), the biodiversity of the area is described below. This will be updated by specialist studies during the EIA phase.

6.2.1 BIODIVERSITY

BRMO is located within the Savanna biome and more specifically within the Eastern Kalahari Bushveld Bioregion with some incursion into Kalahari Duneveld, according to a biodiversity assessment undertaken by Scientific Aquatic Services (Report Reference: SAS 211022 dated in May 2011, refer to Figure 6-5). The site consists of transformed land (current and legacy mining and related infrastructure), open veld (presently used rented to farmers who graze livestock), the Belgravia Game Farm (the only on-site area

presently considered of increased sensitivity), and limited riparian habitat (related to the Ga Magara River).

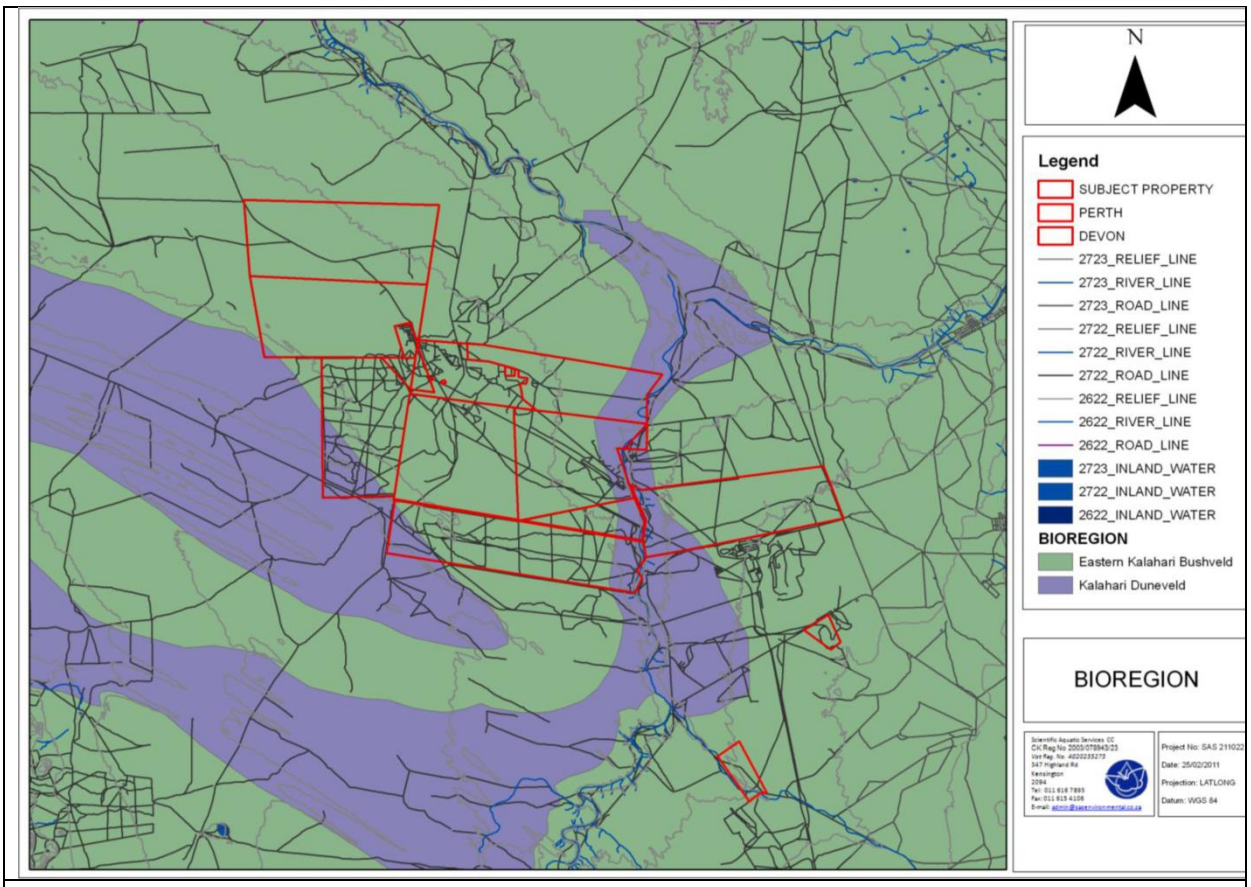

Figure 6-5: Biome (Scientific Aquatic Services. Report Reference: SAS 211022)

6.2.1.1 Floral Diversity

When the boundary of the assessment site is superimposed on the vegetation types of the surrounding area, it is evident that the subject property falls within the Kalahari Thornveld and Shrub Bushveld veld type, Kathu Bushveld vegetation type and partly in the Gordonia Duneveld vegetation type.

Several red data listed (RDL)/protected floral species are documented within the area, as shown in Table 6-2. The species identified are expected to be found throughout the site. None of the listed species may be cut, removed, relocated, or destroyed without permits having been issued by the relevant competent authorities, in terms of the legislation listed in Table 6-2.

Various exotic and/or invasive species are also noted on the area, in particular where ground has been disturbed through trampling or excavation. Dominant exotic species on the site include *Spartium junceum* (Spanish broom), *Pennisetum setaceum* (Fountain grass) *Sesamum triphyllum* (Wild sesame), *Verbesina encelioides* (Wild sunflower), *Ziziphus mucronata* (Buffalo thorn), *Morus nigra* (Black mulberry), *Melia azedarach* (Syringa), Eucalyptus sp. (Gum trees), *Chinus molle* (Pepper tree), *Prosopis glandulosa* var. *torreyana* (Mesquite), *Agave americana* (Sisal), *Cuscuta campestris* (Dodder), *Opuntia ficus-indica* (Sweet prickly pear), *Nerium oleander* (Oleander), *Lantana camara* (Lantana), *Ipomoea indica* (Morning glory), *Cortaderia selloana* (Pampas grass).

Table 6-2: Protected species noted in proximity of the site

Scientific Name	Common Name	Regulation
Vachellia Erioloba	Camel Thorn	National Forests Act (1998) - Department of Agriculture, Forestry and Fisheries
Vachellia Haemotoxolyn	Grey Camel Thorn	
Boscia albitrunca	Shepherd's Tree	
Ammocaris Coranica	Karroo Lily	Schedule 4 Environmental and Conservation Ordinance No. 19 (1974) – Northern Cape Department of Environment and Nature Conservation
Harpogophytum Procumbens	Devil's Claw	
Babiana Hypogaea	Bobbejaanuintjie	
Boophane Disticha	Bushman's poison bulb	

6.2.1.2 Faunal Diversity

Evidence of the Common Duiker, Whitetailed Mongoose, Suricate and Scrub Hare have been noted within the area. Field signs (diggings) of Porcupine have also been identified. The old Black Rock mine works could provide suitable habitat for bats, of which there are several threatened species in the Northern Cape. Numerous bird species have been observed on the site. Various reptiles including lizards, skinks, snakes and tortoises are noted or expected within the site. The Ga Magara River may also host amphibians. Numerous invertebrates also inhabit the site.

Likely species categorised as threatened, include African White-backed Vulture, Cape Griffon/Cape vulture, European Roller, Ruppell's horseshoe bat, Geoffrey's horseshoe bat, and Darlings horseshoe bat. Red Data Sensitivity Index Score assessment of the property provided a moderate score of 37%, indicating low to medium importance to RDL faunal species conservation within the region.

6.3 SOCIO-ECONOMIC

The proposed development will have limited if any direct social and economic benefits to the area, with the exception of maintaining the economically sustainable operation of the mine by improving its efficiency and competitiveness. Further social attributes that may typically be affected would include noise, traffic, light pollution, but these will be unchanged.

As the development will expand on existing skills at BRMO, there are unlikely to be any new positions related to the operation of the facilities. In all likelihood, the existing positions will be transferred to the Centralised facility. Opportunities for the construction phase, will be short term (between 6 months and 1 year) and were possible should be filled by local contractors.

6.4 HERITAGE

6.4.1 ARCHAEOLOGICAL AND CULTURAL

Heritage impact assessments have been undertaken at BRMO in 2009 (African Heritage Consultants CC, Cultural Heritage Impact Assessment, 2009) and 2011 (Archaetnos, Culture & Cultural report ASBR, 2011). Various sites of significance have been identified within the BRMO properties (See Figure 6-6); these include:

- The Old Black Rock Mine works (otherwise referred to as the Black Rock Koppie and associated infrastructure.
- Mine workers cemetery
- Sites of stone age origin in the Gamagara river basin.
- Farm cemetery on the farm Belgravia

BRMO has subsequently developed a heritage management plan. At present all identified sites of heritage significance are outside the proposed location of the planned centralised WWTW.

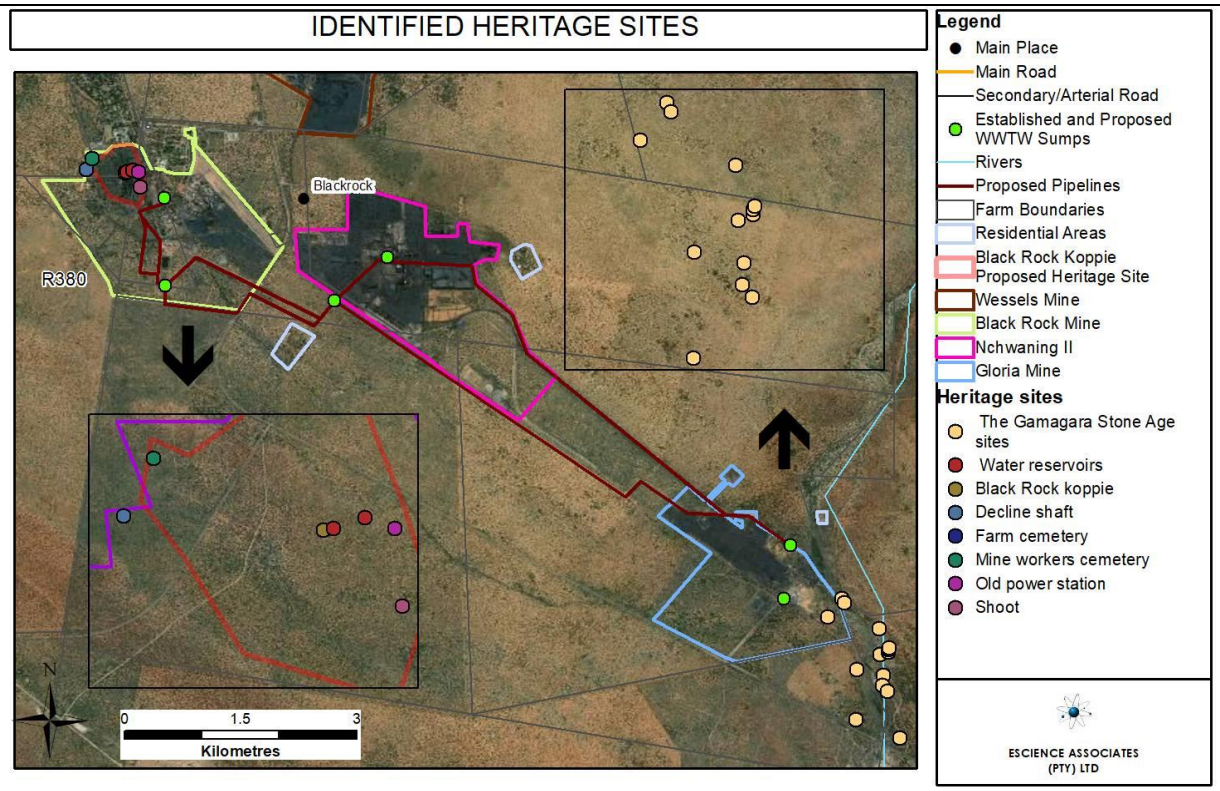

Figure 6-6: Identified heritage sites within the area.

Given the potential for identifying archaeological findings of significance, a heritage specialist will be required to provide a specialist assessment during the EIA phase.

6.4.2 PALAEONTOLOGICAL

BRMO development is underlain by the Cretaceous to Tertiary Kalahari Formation (Qs) and underlying Griqualand West Basin rocks, Transvaal Supergroup of Vaalian age, see Figure 6-7.

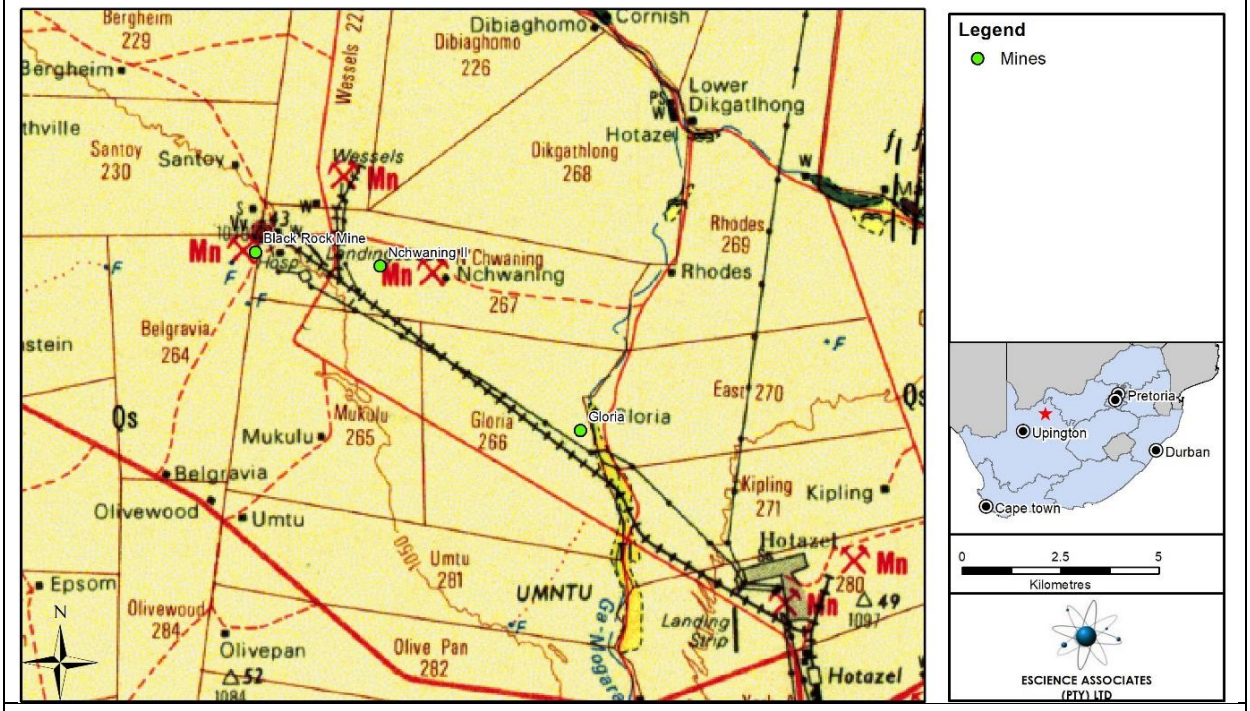

Figure 6-7: Extract of geological map of the area

The Kalahari deposits are approximately Ca 65 – 2.5 million years old (Ma). The Cenozoic Kalahari Group is the most widespread body of terrestrial sediments in southern Africa. The Cenozoic sands and calcretes of the Kalahari Group range in thickness from a few metres to more than 180m (Partridge et al., 2006). The youngest formation of the Kalahari group is the Gordonia Formation which is generally termed Kalahari sand and comprises of red aeolian sands that covers most of the Kalahari Group sediments. The pan sediments of the area originated from the Gordonia Formation and contains white to brown fine grained silts, sands and clays. Some of the pans consist of clayey material mixed with evaporates that show seasonal effects of shallow saline groundwaters. Quaternary alluvium, aeolian sands, surface limestone, silcrete, and terrace gravels are also included in the Kalahari Group (Kent 1980).

The fossil assemblages of the Kalahari are generally very low in diversity, and occur over a wide range and thus the palaeontological diversity of this Group is low. These fossils represent terrestrial plants and animals with a close resemblance to living forms, refer to Table 6-3. Fossil assemblages include bivalves, diatoms, gastropod shells, ostracods and trace fossils.

Table 6-3: Fossil Heritage (adapated from Almond and Pether 2009)

Subgroup/ sequence	Group	Formation	Fossil Heritage	Comment
Tertiary-Quaternary	Kalahari	-	Terrestrial organisms	Trace fossils, ostracods, bivalves, gastropod shells, diatoms
Griqualand West Super Group	Campbell	Ghaapplato (Vgh)	Stromatolites	Cyanobacterial microfossils are present
-	Griquastad	Asbestos Hills	Stromatolites	Cynanobacterial microfossils are present

Hotazel is located in the Griqualand West Basin, Northern Cape Province which consists of clastic sediments as well as volcanic rocks, diamictites and banded iron formations. Manganese deposits are present in the Hotazel Formation, upper Postmasburg Group (approximately 2222 Ma). The Vryburg Formation is the basal unit and overlies unconformably the granite and rocks of the Ventersdorp Supergroup. The Campbell Group overlies the Vryburg Formation and consists of the Schmidtsdrif Formation and the upper Ghaap Plateau Formation. The Griquatown Group is divided into two formations namely the Asbestos Hills and Koegas Formations. The Gamagara Formation follows and is positioned on the Maremane Anticline, and is overlain by the Makganyene Formation. The Cox Group comprises of the lower Ongeluk Formation and the upper Voëlwater Formation. The Ongeluk Formation was deposited under water and reaches a thickness of between 400 and 900 m. This Formation is basal and is mainly volcanic (Visser 1989). Manganese is present in the upper Voëlwater Formation (Snyman 1996). According to Kent (1980) and Snyman (1996) Griqualand West Basin attains a maximum thickness of 4500 m.

Algal growth structures, also known as "Stromatolites", are fossil structures described from the dolomites of the Transvaal Supergroup. Stromatolites are layered mounds, columns and sheet-like sedimentary rocks. These structures were originally formed by the growth of layer upon layer of cyanobacteria, a single-celled photosynthesizing microbe. Cyanobacteria are prokaryotic cells (simplest form of modern carbon-bases life). Stromatolites are first found in Precambrian rocks and are known as the earliest known fossils. The oxygen atmosphere that we depend on was generated by numerous cyanobacteria photosynthesizing during the Archaean and Proterozoic Era.

According to the SAHRIS palaeo-sensitivity map (Figure 6-8) there is very little chance of finding fossils in this area, and a desktop study of the area of interest is required. A paleontological specialist will be required to undertake such a study during the EIA phase.

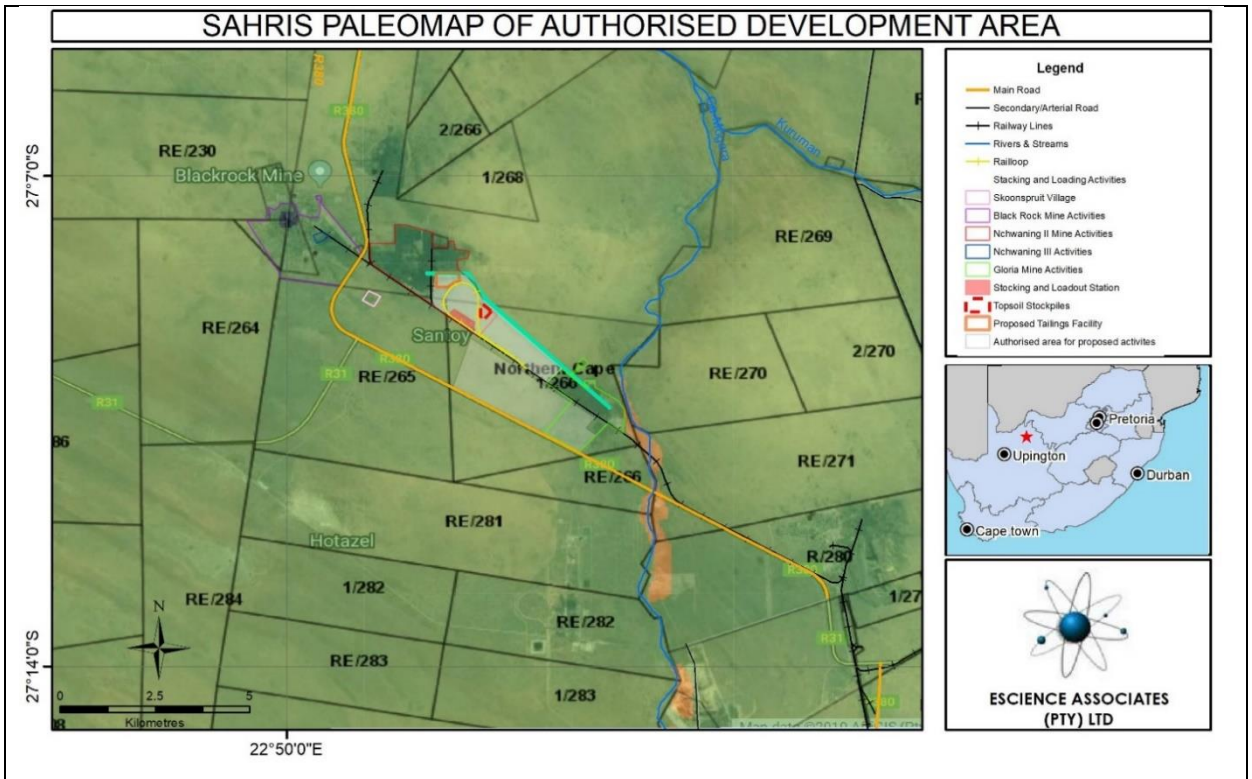

Figure 6-8: Extract of the 1: 250 000 SAHRIS PalaeoMap map (Council of Geosciences).

6.5 CURRENT LAND USE

The current proposed sites are within the mining right area. All the alternatives fall within areas dominated by natural vegetation. As indicated in section 1.3 of this report, the region surrounding BRMO is dominated by mining, industrial and agricultural (generally livestock production) land uses. Land in the immediate vicinity of BRMO that is not used for mining/industrial purposes, is utilised for livestock farming (i.e. sheep, goats, and cattle) and game farming (Refer to Figure 6-9 and Figure 6-10). The proposed site is currently reserved for mining activities.

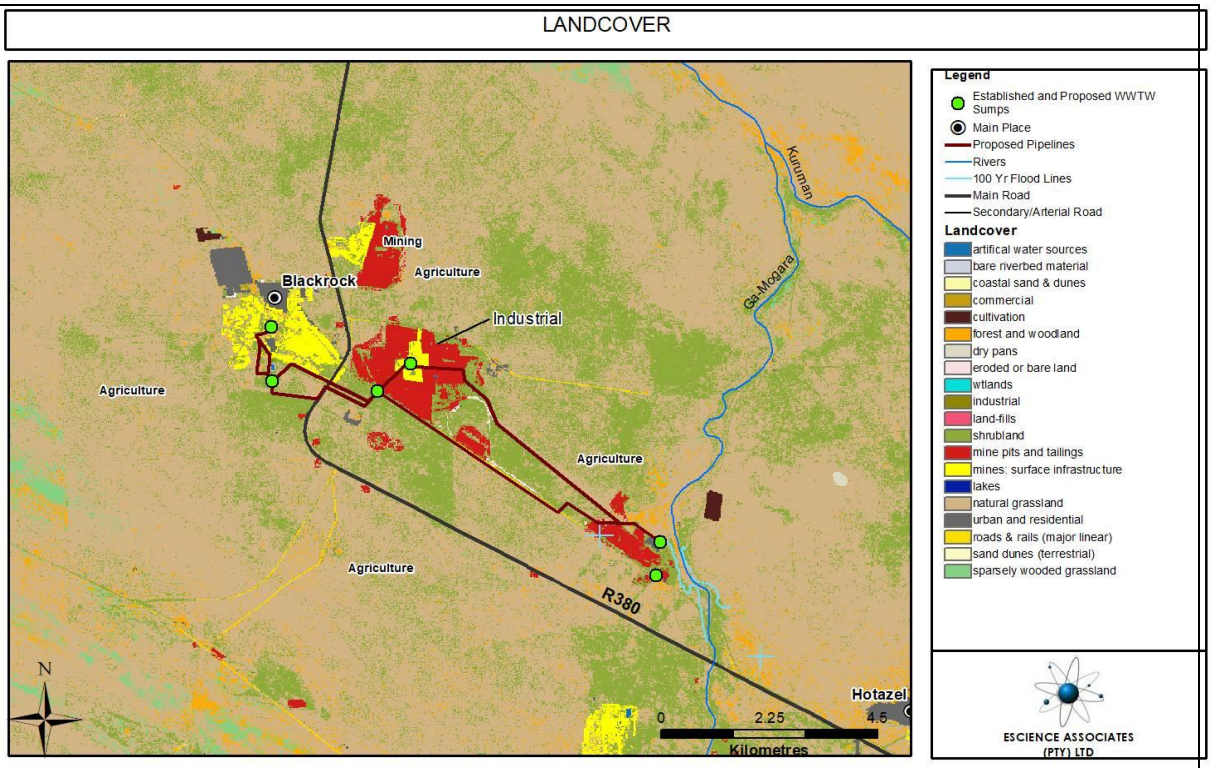

Figure 6-9: Landcover of BRMO properties and surrounding areas

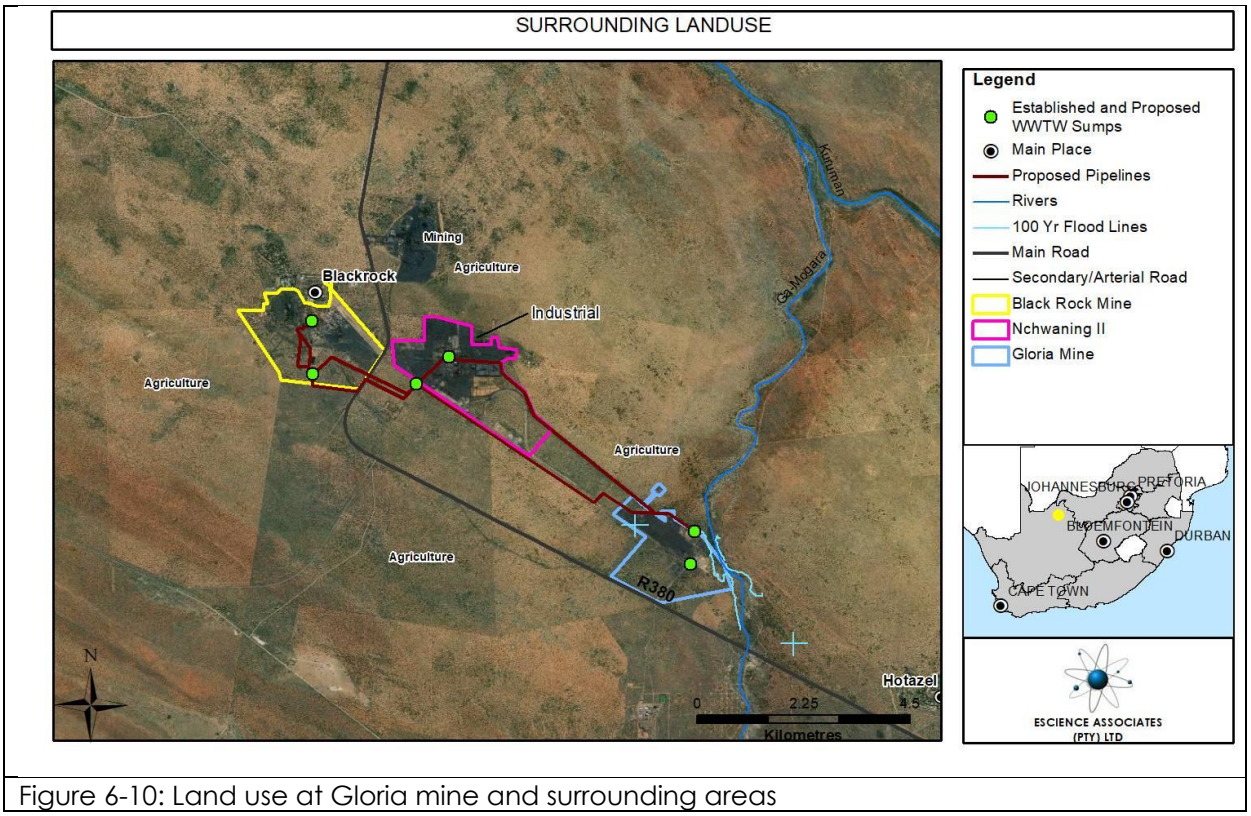

Figure 6-10: Land use at Gloria mine and surrounding areas

7 SITE SELECTION

The alternatives are outlined as follows to initially account for the Activity alternatives, followed by location and layout and then technological alternatives:

Alternative 1

- Develop centralised wastewater treatment plant to handle increased wastewater output at BRMO
- Conveyance of wastewater from existing facilities to centralised facility
- Implement reverse osmosis to improve quality after wastewater treatment
- Decommissioning the existing wastewater treatment facilities at Gloria, Nchwaning II and Black Rock
- Treatment/disposal of brine in drying beds

Alternative 2

- Continue operations at existing wastewater treatment plants and expand the current Black Rock WWTW to accommodate demand as expansion not viable at Gloria and Nchwaning II STP
- Some conveyance of excess wastewater from Gloria and Nchwaning II WWTW to Black Rock
- No additional treatment of water quality

No fatal flaws have been identified for the site locations considered. Notably the selection of potential sites for the Centralised Sewage treatment works is largely limited to areas proximal to the plant whilst ideally situating in areas of similar elevation to avoid the need for pumping of wastewater. Additionally, due to potential concerns of odour generation, the further from receptors, the better.

Existing infrastructure and the existing WWTW are significant factors in narrowing down potential sites to the two sites selected. Selection of the preferred site has been undertaken using a first principles approach based on:

1. Environmental impacts
2. Socio-economic impacts and constraints
3. Design and operating constraints
4. Capital and running cost considerations

The scores in the adjacent columns, for each alternative, indicate whether the outcome is positive or negative for each aspect/criterion considered:

+1 indicates a net benefit or significant advantage over the other alternatives

-1 indicates a net deterioration or significant disadvantage relative to the other alternatives

0 neutrality.

A cumulative sum at the bottom of the table indicates the net outcome of all considerations.

The assessment in Table 7-1 clearly indicates the preferable site having considered numerous factors relevant to site selection.

Table 7-1: Site Selection Matrix

Consideration	Alternative 1 - Centralised Wastewater Treatment Plant	Score	Alternative 2 - Continue operations at existing WWTW and expand the current Black Rock WWTW	Score
Clearing of undisturbed land	Some clearing required, although already disturbed	-1	No clearing required	1
Removal of indigenous vegetation	Removal required	-1	Unlikely	0
Removal of protected plant biota	Removal/relocation of protected plants and trees may be required	-1	Removal/relocation of protected plants and trees may be required	-1
Within 100m of a natural drainage channel or water course other than a wetland	Not located within natural drainage channel or water course	1	Not located within natural drainage channel or water course	1
Within 500m of a wetland, or riparian area	Not located within 500m of a wetland or riparian area	1	Not located within 500m of a wetland or riparian area	1
Proximity to seismic risk zones	None	1	None	1
Presence of dispersive soils	None	1	None	1
Other geotechnical considerations	None	1	None	1
Underlain by unstable geology, dolomitic or karst areas where sinkholes and subsidence are likely	None	1	None	1
Comparative proximity to ground water resources	Nearest borehole (GPT01) indicates depth of to water in the order of 40 mbgl	1	No boreholes in proximity, thus undetermined	0
Comparative proximity to surface water	Located more than 8km away from the Gamagara River	1	Located more than 8km away from the Gamagara River	1
Within a declared conservation area	None	1	None	1
Comparative proximity to heritage resources	Located approximately 1200m from Black Rock Koppie	1	Located approximately 300m from Black Rock Koppie	-1
Land use zoning	Mining	1	Mining	1
Distance to nearest receptors	1450m	1	350m	-1
Surface gradient	Flat	1	Flat	1
Depth to bedrock	Anticipated to be over 50m	1	Anticipated to be over 50m	1
Servitudes within proposed site	None	1	None	1
Energy usage for pumping of water	Smaller gradient requiring less energy to pump to CWWTW	0	Higher cost due to pumping uphill to Black Rock WWTW	-1
Visual impact	Proximal to existing mine activities. No change to aesthetic profile expected.	0	Proximal to existing mine activities. No change to aesthetic profile expected.	0

Table 7-1: Site Selection Matrix

Consideration	Alternative 1 - Centralised Wastewater Treatment Plant	Score	Alternative 2 - Continue operations at existing WWTW and expand the current Black Rock WWTW	Score
Noise	Within existing mine activities, no change to noise profile expected.	0	Within existing mine activities, no change to noise profile expected.	0
Likelihood of spills	Unlikely due to the environmental considerations that are required for the development	+1	Less likely as current operations have experienced failures leading to spills of wastewater.	-1
Pumping costs	Less due to lesser gradient	1	Higher running cost due to higher energy requirements for transport of wastewater	1
Installation Cost	Costs to establish WWTW and pipelines	-1	Cost of pipelines and establishment of additional SBR's at Black Rock	-1
Odour	Less likely to affect external receptors or BRMO employees	1	More likely to impact external receptors and staff due to proximity to Black Rock Village and Admin related activities at Black Rock Mine	-1
Proximity to access road	Area adjacent to access road	1	Area adjacent to access road	1
Outcome	**Location 1**	**15**	**Location 2**	**8**

Assessing the site selection matrix, it is seen as though an expansion to the Black Rock WWTW is not feasible due to the various impacts that are anticipated. Although most of these impacts are the same for both the centralised WWTW and the Black Rock WWTW, as a result of the existing facility, certain infrastructure is likely to remain and therefore lead to more significant issues arising. Whereas, the infrastructure of the Centralised WWTW will be established to meet the requirements of the various norms and standards.

8 ENVIRONMENTAL ASPECTS & IMPACTS

Below is a preliminary assessment of environmental aspects and their associated impacts relating to the proposed project. Differentiation is made between significance of impact and priority for the management of an impact, which is determined by impact significance, and existence of applicable legislation. Detailed analysis/interrogation of the following impacts is proposed for the EIA phase of the project. Note that assessment of the location alternatives has been conducted collectively as all the alternatives are located within close proximity and therefore all potential impacts are assumed to be similar with the limited information available at the scoping phase.

Note that the proposed WWTW is assessed separately (section 8.1, 8.2 and 8.3) to the proposed pipeline network (section 8.4, 8.5 and 8.6).

8.1 CONSTRUCTION PHASE IMPACTS FOR THE CENTRALISED WASTEWATER TREATMENT WORKS AND REVERSE OSMOSIS PLANT

8.1.1 MANAGEMENT AND DISPOSAL OF GENERAL WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Site: These activities will all occur within BRMO. BRMO operates a licensed general landfill that will receive all unrecyclable general waste.		1
Duration (D)	Very long term: Waste will be permanently placed in landfill. Besides the landfill, impact on soil and water is only expected in the event of incorrect storage, transportation, or disposal of waste.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants have limited possibility of entering groundwater and would be in small quantities and of limited risk.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate waste storage skips and bins, which will largely eliminate the potential for soil and groundwater contamination. Disposal will be to the licenced BRMO landfill.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**24**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**12**

8.1.2 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Provincial: Hazardous wastes are expected to be minimal. These will be managed via BRMO's hazardous waste transfer facility. Hazardous wastes would however be disposed or recycled in other provinces due to the lack of suitable facilities locally.		4
Duration (D)	Very long term: Impact on soil and water is only expected in the event of a spill outside of the bunded storage areas or during transport. The subsequent impact on groundwater for example may remain for several years.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected mainly due to the low quantities.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate bunded facilities, for storage will largely eliminate the potential for soil and groundwater contamination. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers. Using a suitable waste management contractor for transporting waste to licenced management facilities will also effectively reduce risk.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**36**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**18**

8.1.3 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.	1
Extent (E)	Locally: Localised to the site and immediate surrounds.	2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.	4

Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may enter groundwater will be in small quantities.		2
Probability (P)	Unlikely: The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such used oil and lubricants will in any case be stored in sealed drums/containers.		2
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**16**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**8**

8.1.4 SOIL CONTAMINATION

Nature (N)	Direct Negative impact on the site.	1
Extent (E)	On site.	1
Duration (D)	Long term: Only contaminated soil is not remediated the impact can be expected to remain for a long period of time depending on the nature of the contaminants.	4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.	2
Probability (P)	Very likely: The clearance of undisturbed land will occur. The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers.	3
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for contamination. There are many measures that can be implemented in order to prevent soil and groundwater contamination.	4

Enhancement (H)	N/A		-
Reversibility (R)	Moderately reversible: the impact requires that effort is taken immediately after the impact.		3
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**15**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**9**

8.1.5 AIR QUALITY

Nature (N)	Negative impact on ambient air quality.		1
Extent (E)	Locally: Localised to the site and immediate surrounds.		2
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: Natural processes or functions are not expected to be appreciably affected by dust and dust deposition.		1
Probability (P)	Definite: Construction activities and transport of materials will result in entrainment of particulate matter.		5
Mitigation (M)	Moderately mitigated: Effective dust suppression methods readily available for transport, but less so for excavation and materials handling.		3
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**8**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**6**

8.1.6 NOISE

Nature (N)	Negative impact on site.		1
Extent (E)	On site: Localised to the site.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: The facility is within a mining area and there are no nearby noise receptors outside of the facility.		1
Probability (P)	Definite: Noise will be generated by excavation and other equipment and activities.		5
Mitigation (M)	Well mitigated: To be limited to normal working hours, in accordance with locally applicable by-laws.		4
Enhancement (H)	N/A		-
Reversibility (R)	Irreversible: The status quo will return to the previous status quo upon completion of construction.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Low**	**15**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**6**

8.1.7 BIODIVERSITY

Nature (N)	Negative impact on vegetation.	1
Extent (E)	Site: Construction will occur within the BRMO site boundary but will occur over undisturbed land.	1
Duration (D)	Very long term. The mine has a predicted lifespan past 2038.	5
Intensity (I)	Moderate: Protected plant and tree species must be removed. It is not expected that the removal will result in a critical impact on species diversity and vulnerable ecosystems in isolation, but it is important to consider this impact in the context of the wider cumulative impact.	3
Probability (P)	Definite: clearance of undisturbed land will occur.	5
Mitigation (M)	May be well mitigated by relocation of protected plant species, and minimisation of tree removal.	3
Enhancement (H)	N/A	-

Reversibility (R)	Reversible: Site will be rehabilitated upon decommissioning based on the existing mine wide EMPr for BRMO, and the EMPr developed as part of this Basic Assessment.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**36**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**26**

8.1.8 SOCIO ECONOMIC

Nature (N)	Positive impact on job creation.		-0.25
Extent (E)	Regional: Expected to have an impact beyond the local municipal and district municipal boundaries.		3
Duration (D)	The duration of the construction will be short term.		2
Intensity (I)	Moderate: The number of jobs created will not be large and these jobs will be temporary. It is likely that contractors with existing employees will largely be used.		3
Probability (P)	Definite: Impact will occur.		5
Mitigation (M)	N/A		-
Enhancement (H)	Moderate enhancement, in the form of the proponent making a concerted effort to employ workers from the surrounding areas, can be applied.		3
Reversibility (R)	N/A		N/A
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Moderate)**	**-56**

8.1.9 ODOUR

Nature (N)	Negative nuisance impact on ambient air quality.	1
Extent (E)	Site: Besides fumes from diesel engines no odour impact is not expected.	1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.	2
Intensity (I)	Negligible: No natural processes or other receptors are expected to be appreciably affected by odour	1

Probability (P)	Negligible: No natural processes or other receptors are expected to be appreciably affected by odour.		1
Mitigation (M)	No mitigation required.		1
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**1.2**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**1**

8.1.10 VISUAL/AESTHETIC

Nature (N)	Negative impact on ambient air quality.		1
Extent (E)	Site: The activities facility will only be visible from the site.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: No receptors are expected to be appreciably affected.		1
Probability (P)	Very unlikely: The activities facility will only be visible from the site.		1
Mitigation (M)	Well mitigated: Grassing of the facilities slopes will blend the facility with natural surrounding veld.		4
Enhancement (H)	N/A		-
Reversibility (R)	Irreversible: If the facility is not removed prior to closure of the mine then it will remain in perpetuity.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**3**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**1**

8.1.11 HERITAGE RESOURCES

Nature (N)	Negative impact on heritage resources if they are present.		1
Extent (E)	Locally: Localised to the site, but may be of significance in respect of the wider heritage aspects of the surrounding area.		2
Duration (D)	Permanent: Once damaged or destroyed the impact may be permanent.		5
Intensity (I)	Minor: Previous studies of the area have shown that the probability of significant finds is low.		2
Probability (P)	Negligible: If no findings are made during the construction phase then no findings will be expected during the operational phase as there will be no excavation or new clearing of land.		1
Mitigation (M)	Well mitigated: Adequate assessment and planning may be effective for identifying prospective heritage resources.		3
Enhancement (H)	N/A		-
Reversibility (R)	Not reversible.		1
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Low**	**14**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**7**

8.1.12 SURFACE WATER

Nature (N)	Negative impact on water quality.	1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.	1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.	2
Intensity (I)	Negligible: Natural processes or functions are not expected to be appreciably affected.	1
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.	1

Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.		3
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo will remain until closure.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**3**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**2**

8.1.13 TRAFFIC

Nature (N)	Negative impact on traffic in the area.		1
Extent (E)	Site: The majority of vehicular movement will be within the BRMO boundaries.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: No external users are expected to be appreciably affected. The majority of vehicular movement will be within the BRMO boundaries.		1
Probability (P)	Negligible: The activities facility will only be visible from the site.		1
Mitigation (M)	No mitigation required		1
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**1.2**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**1**

8.2 OPERATION PHASE IMPACTS FOR THE CENTRALISED WASTEWATER TREATMENT WORKS AND REVERSE OSMOSIS PLANT

8.2.1 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE FROM SEWAGE TREATMENT

Nature (N)	Potential negative impact on water resource quality		1
Extent (E)	Provincial: Hazardous wastes are expected to be minimal. These will be managed via BRMO's hazardous waste transfer facility. Hazardous wastes would however be disposed or recycled in other provinces due to the lack of suitable facilities locally.		4
Duration (D)	Long term: Impact on soil and water is only expected in the event of a spill outside of the bunded storage areas or during transport. The subsequent impact on groundwater for example may remain for several years.		5
Intensity (I)	Moderate: Moderate quantities of waste will be generated by the operational phase of the facility. Natural processes or functions are not expected to be appreciably affected.		3
Probability (P)	Unlikely: The potential for incorrect storage and disposal of waste without proper mitigation and management in place is low.		2
Mitigation (M)	Can be well mitigated: Providing adequate bunded facilities, for storage will largely eliminate the potential for soil and groundwater contamination. Hazardous waste derived from the sewage treatment works should in sealed drums/containers. Using a suitable waste management contractor for transporting waste to licenced management facilities will also effectively reduce risk.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**36**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**18**

8.2.2 MANAGEMENT AND DISPOSAL OF GENERAL WASTE FROM SEWAGE TREATMENT PLANT

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Site: These activities will all occur within BRMO. BRMO operates a licensed general landfill that will receive all unrecyclable general waste.		1
Duration (D)	Long term: Waste will be permanently placed in landfill. Besides the landfill, impact on soil and water is only expected in the event of incorrect storage, transportation, or disposal of waste.		4
Intensity (I)	Negligible: Very low quantities if waste will be generated by the operational phase of the facility. Natural processes or functions are not expected to be appreciably affected		1
Probability (P)	Likely: The potential for incorrect storage and disposal of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate waste storage skips and bins, which will largely eliminate the potential for soil and groundwater contamination. Disposal will be to the licenced BRMO landfill.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**10**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**5**

8.2.3 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.		1
Extent (E)	Locally: Reported that the basin is endorheic, and that no water leaves the catchment, therefore effect is likely to be limited to immediate surroundings.		2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.		4
Intensity (I)	Moderate: Without adequate mitigation there may be potential for quantities of untreated water percolating to groundwater. This must be assessed in the EIA phase.		3
Probability (P)	Very Likely: Without adequate mitigation there may a high probability of significant quantities of affected water percolating to groundwater. This must be assessed in the EIA phase.		4
Mitigation (M)	Well mitigated: Effective design, monitoring and management measures can prevent potentially significant impacts.		4
Enhancement (H)	N/A		-
Reversibility (R)	Reversible: Reported that the entire facility will be bunded to prevent groundwater contamination from occurring.		4
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**28.8**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**18**

The impacts and effects of the treatment of brine from the reverse osmosis plant in evaporation ponds will be assessed accordingly by a geohydrological assessment.

8.2.4 SOIL CONTAMINATION

Nature (N)	Negative impact on water resource quality		1
Extent (E)	Site: This would apply to soil beneath the site, and immediate surrounds in case of a spill or slippage.		1
Duration (D)	Long term: If the impacted area is not addressed.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.		2
Probability (P)	Moderate: Without adequate mitigation there may a probability of quantities of effluent percolating to subsoil. This must be assessed in the EIA phase.		3
Mitigation (M)	Well mitigated: Effective design, monitoring and management measures can prevent potentially significant impacts.		4
Enhancement (H)	N/A		-
Reversibility (R)	Reversible: Affected soil may be removed.		4
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**12**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**7.5**

8.2.5 NOISE

Nature (N)	Negative impact on site.		1
Extent (E)	On site: Localised to the site.		1
Duration (D)	Very long term. The mine has a predicted lifespan past 2038.		5
Intensity (I)	Negligible: In the context of existing noise profile of the site and surrounds (neighbouring mine) noise from the above mentioned sources is expected be negligible in comparison, thus having no discernible effect.		1
Probability (P)	Unlikely: It is unlikely that significant noise will be generated during the operational phase.		1
Mitigation (M)	Unmitigated: mitigation is not practical.		1
Enhancement (H)	N/A		-
Reversibility (R)	Reversible: The status quo will return to the previous status quo upon completion of construction.		4
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**2.4**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**2.4**

8.2.6 SOCIO ECONOMIC

Nature (N)	Positive impact on job creation.		-0.25
Extent (E)	Site: Expected to have an impact within the employees, already employed at BRMO, who are likely to be transferred to the new centralised facility.		1
Duration (D)	Long term: The duration of operation of the facility.		5
Intensity (I)	Low: The number of jobs created will be low for the operational phase. Potentially there will be no new jobs as existing employees from the current wastewater treatment works will be transferred to the centralized facility.		1
Probability (P)	Definite.		5
Mitigation (M)	N/A		-
Enhancement (H)	Low: The number of jobs created will be low for the operational phase. Potentially there will be no new jobs as existing employees from the current wastewater treatment works will be transferred to the centralized facility.		1
Reversibility (R)	N/A		N/A
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Negligible)**	**-7.5**

8.2.7 ODOUR

Nature (N)	Negative impact through generation of odour.		1
Extent (E)	Site: The activities facility will only be visible from the site.		1
Duration (D)	Long term: The impact, if it is present, will persist for the duration of operation.		4
Intensity (I)	Negligible: No receptors are expected to be appreciably affected. The sense of place is not expected to be affected.		3
Probability (P)	Negligible: The activities facility will only be visible from the site.		4
Mitigation (M)	Moderately mitigated: Effective dust suppression methods readily available for transport, but less so for excavation and materials handling.		3
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Moderate**	**24**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**17**

8.2.8 SURFACE WATER

Nature (N)	Negative impact on water quality.		1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.		1
Duration (D)	Short term: Due to the low frequency of rainfall and absence of surface drainage it is unlikely that there would be any long term surface water impacts.		2
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected.		2
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.		1
Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.		4
Enhancement (H)	N/A		-
Reversibility (R)	Status quo will remain once operational.		1
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**6**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**2**

8.3 CLOSURE AND POST CLOSURE PHASE IMPACTS FOR THE CENTRALISED WASTEWATER TREATMENT WORKS AND REVERSE OSMOSIS PLANT

8.3.1 MANAGEMENT AND DISPOSAL OF GENERAL WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Site: These activities will all occur within BRMO. BRMO operates a licensed general landfill that will receive all unrecyclable general waste.		1
Duration (D)	Long term: Waste will be permanently placed in landfill. Besides the landfill, impact on soil and water is only expected in the event of incorrect storage, transportation, or disposal of waste.		4
Intensity (I)	Negligible: Natural processes or functions are not expected to be appreciably affected. Contaminants that have very limited possibility of entering groundwater and would be in small quantities and of limited risk.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate waste storage skips and bins, which will largely eliminate the potential for soil and groundwater contamination. Disposal will be to the licenced BRMO landfill.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**20**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**10**

8.3.2 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE

Nature (N)	Potential negative impact on water resource quality		1
Extent (E)	Provincial: Hazardous wastes are expected to be minimal. These will be managed via BRMO's hazardous waste transfer facility. Hazardous wastes would however be disposed or recycled in other provinces due to the lack of suitable facilities locally.		4
Duration (D)	Long term: Impact on soil and water is only expected in the event of a spill outside of the bunded storage areas or during transport. The subsequent impact on groundwater for example may remain for several years.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected mainly due to the low quantities.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate bunded facilities, for storage will largely eliminate the potential for soil and groundwater contamination. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers. Using a suitable waste management contractor for transporting waste to licenced management facilities will also effectively reduce risk.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**36**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**18**

8.3.3 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.		1
Extent (E)	Locally: Localised to the site and immediate surrounds.		2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may enter groundwater will be in small quantities.		2
Probability (P)	Unlikely: The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such used oil and lubricants will in any case be stored in sealed drums/containers.		2
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**16**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**8**

8.3.4 SOIL CONTAMINATION

Nature (N)	Direct Negative impact on the site.		1
Extent (E)	On site.		1
Duration (D)	Long term: Only if contaminated soil is not remediated then the impact can be expected to remain for a long period of time depending on the nature of the contaminants.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.		2
Probability (P)	Very likely: The clearance of undisturbed land will occur. The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers.		3
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for contamination. There are many measures that can be implemented in order to prevent soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Moderately reversible: the impact requires that effort is taken immediately after the impact.		3
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**15**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**9**

8.3.5 NOISE

Nature (N)	Negative impact on site.		1
Extent (E)	On site: Localised to the site.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: The facility is within a mining area and there are no nearby noise receptors outside of the facility.		1
Probability (P)	Definite: Noise will be generated by excavation and other equipment and activities.		5
Mitigation (M)	Well mitigated: To be limited to normal working hours, in accordance with locally applicable by-laws.		4
Enhancement (H)	N/A		-
Reversibility (R)	Irreversible: The status quo will return to the previous status quo upon completion of construction.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**6**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**4**

8.3.6 BIODIVERSITY

Nature (N)	Positive: impact on vegetation.		-0.25
Extent (E)	Site: The site will be rehabilitated back to current land use		1
Duration (D)	Permanent.		5
Intensity (I)	Moderate: Rehabilitation back to prior land use.		3
Probability (P)	Definite: A closure plan is in place along with closure quantum guarantees for the mine.		5
Mitigation (M)	N/A		-
Enhancement (H)	Can be enhanced by future declaration of conservation status. Although this is not guaranteed.		2
Reversibility (R)	Reversible: Site will be rehabilitated upon decommissioning based on the existing mine wide EMPr for BRMO, and the EMPr developed as part of this Basic Assessment.		N/A
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Positive (Moderate)**	**-45**

8.3.7 SOCIO ECONOMIC

Nature (N)	Positive impact on job creation.		-0.25
Extent (E)	Local: Expected to have an impact within the surrounds local municipality.		2
Duration (D)	The duration of the closure phase activities will be short term.		2
Intensity (I)	Minor: The number of jobs created will not be large and these jobs will be temporary. It is likely that contractors with existing employees will largely be used.		2
Probability (P)	Definite: Impact will occur.		5
Mitigation (M)	N/A		-
Enhancement (H)	Moderate enhancement, in the form of the proponent making a concerted effort to employ workers from the surrounding areas, can be applied.		3
Reversibility (R)	N/A		N/A
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Moderate)**	**-30**

8.3.8 ODOUR

Nature (N)	Negative nuisance impact on ambient air quality.		1
Extent (E)	Site: Besides fumes from diesel engines no odour impact is not expected.		1
Duration (D)	Short term: closure phase activities anticipated to be up to 6 months.		2
Intensity (I)	Negligible: No natural processes or other receptors are expected to be appreciably affected.		1
Probability (P)	Negligible: Probability of odour is highly unlikely.		1
Mitigation (M)	No mitigation required.		1
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of closure phase activities the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**1.2**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**1**

8.3.9 SURFACE WATER

Nature (N)	Negative impact on water quality.		1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.		1
Duration (D)	Long term: If there are any impacts they may continue in perpetuity if nor addressed during the closure design.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected.		2
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.		1
Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.		3
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of closure phase activities the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**4**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**3**

8.4 CONSTRUCTION PHASE IMPACTS FOR THE WASTEWATER PIPELINE

8.4.1 MANAGEMENT AND DISPOSAL OF GENERAL WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Site: These activities will all occur within BRMO. BRMO operates a licensed general landfill that will receive all unrecyclable general waste.		2
Duration (D)	Long term: Waste will be permanently placed in landfill. Besides the landfill, impact on soil and water is only expected in the event of incorrect storage, transportation, or disposal of waste.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that have limited possibility of entering groundwater and would be in small quantities and of limited risk.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate waste storage skips and bins, which will largely eliminate the potential for soil and groundwater contamination. Disposal will be to the licenced BRMO landfill.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**28**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**14**

8.4.2 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Provincial: Hazardous wastes are expected to be minimal. These will be managed via BRMO's hazardous waste transfer facility. Hazardous wastes would however be disposed or recycled in other provinces due to the lack of suitable facilities locally.		4
Duration (D)	Long term: Impact on soil and water is only expected in the event of a spill outside of the bunded storage areas or during transport. The subsequent impact on groundwater for example may remain for several years.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected mainly due to the low quantities.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate bunded facilities, for storage will largely eliminate the potential for soil and groundwater contamination. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers. Using a suitable waste management contractor for transporting waste to licenced management facilities will also effectively reduce risk.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**36**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**18**

8.4.3 SOCIO-ECONOMIC

Nature (N)	Positive impact on job creation.		0
Extent (E)	Local: Expected to have an impact within the surrounds local municipality.		2
Duration (D)	The duration of the construction will be short term.		2
Intensity (I)	Moderate: The number of jobs created will not be large and these jobs will be temporary. It is likely that contractors with existing employees will largely be used.		3
Probability (P)	Definite: Impact will occur.		5
Mitigation (M)	N/A		-
Enhancement (H)	Moderate enhancement, in the form of the proponent making a concerted effort to employ workers from the surrounding areas, can be applied.		3
Reversibility (R)	N/A		N/A
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Moderate)**	**-45**

8.4.4 BIODIVERSITY

Nature (N)	Negative impact on vegetation.		1
Extent (E)	Local: Construction will occur within the BRMO and adjacent to the site boundary.		2
Duration (D)	Very long term. The mine has a predicted lifespan past 2038.		5
Intensity (I)	Moderate: Protected plant and tree species must be removed. It is not expected that the removal will result in a critical impact on species diversity and vulnerable ecosystems in isolation, but it is important to consider this impact in the context of the wider cumulative impact.		3
Probability (P)	Definite: clearance of undisturbed land will occur.		5
Mitigation (M)	May be well mitigated by relocation of protected plant species, and minimisation of tree removal.		3
Enhancement (H)	N/A		-
Reversibility (R)	Reversible: Site will be rehabilitated upon decommissioning based on the existing mine wide EMPr for BRMO, and the EMPr developed as part of this Environmental Impact Report		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**42**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**30**

8.4.5 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.		1
Extent (E)	Locally: Localised to the site and immediate surrounds.		2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may enter groundwater will be in small quantities.		2
Probability (P)	Unlikely: The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such used oil and lubricants will in any case be stored in sealed drums/containers.		2
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**16**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**8**

8.4.6 SOIL CONTAMINATION

Nature (N)	Direct Negative impact on the site.		1
Extent (E)	Local: Impact to soil arising from the pipeline will be limited to the proximity of the pipeline.		1
Duration (D)	Moderate term: Only contaminated soil is not remediated the impact can be expected to remain for a moderate period of time depending on the nature of the contaminants.		3
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.		2
Probability (P)	Very likely: The clearance of undisturbed land will occur. The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers.		3
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for contamination. There are many measures that can be implemented in order to prevent soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Moderately reversible: the impact requires that effort is taken immediately after the impact.		3
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**12**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**7**

8.4.7 NOISE

Nature (N)	Negative impact on site.		1
Extent (E)	On site: Localised to the site.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: The facility is within a mining area and there are no nearby noise receptors outside of the facility.		1
Probability (P)	Definite: Noise will be generated by excavation and other equipment and activities.		5
Mitigation (M)	Well mitigated: To be limited to normal working hours, in accordance with locally applicable by-laws.		4
Enhancement (H)	N/A		-
Reversibility (R)	Irreversible: The status quo will return to the previous status quo upon completion of construction.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**8**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**6**

8.4.8 HERITAGE RESOURCES

Nature (N)	Negative impact on heritage resources if they are present.		1
Extent (E)	Locally: Localised to the site, but may be of significance in respect of the wider heritage aspects of the surrounding area.		2
Duration (D)	Permanent: Once damaged or destroyed the impact may be permanent.		5
Intensity (I)	Minor: Previous studies of the area have shown that the probability of significant finds is low.		2
Probability (P)	Moderate: Likelihood of encountering sites is unknown. Requires specialist input.		3
Mitigation (M)	Well mitigated: Adequate assessment and planning may be effective for identifying prospective heritage resources.		3
Enhancement (H)	N/A		-
Reversibility (R)	Not reversible.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Moderate**	**42**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	**21**

8.4.9 SURFACE WATER

Nature (N)	Negative impact on water quality.		1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.		1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: Natural processes or functions are not expected to be appreciably affected.		1
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.		1
Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.		3
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo will remain until closure.		1
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**3**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**2**

8.4.10 TRAFFIC

Nature (N)	Negative impact on traffic in the area.		1
Extent (E)	Local: The extent of the impact could affect activities outside of BRMO		2
Duration (D)	Short term: Short term impact of construction, crossing the R380.		2
Intensity (I)	Minor: The majority of vehicular movement beyond the R380 crossing is linked to BRMO operations, although impact could affect Wessels, Goodrock Chemworks and Black Rock Village.		2
Probability (P)	Definite impact on R380		5
Mitigation (M)	Mitigation can be applied to ensure that activities are undertaken outside of peak traffic hours.		4
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Low**	**16**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**10**

8.5 OPERATIONAL PHASE IMPACTS FOR THE WASTEWATER PIPELINE

8.5.1 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.	1
Extent (E)	Locally: Localised to the site and immediate surrounds.	2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.	4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may enter groundwater will be in small quantities.	2

Probability (P)	Unlikely: The probability of a significant leak taking place is low. The probability of significant contamination from pipelines is low; however, there is a risk of contamination arising from far a failed pipe.		2
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**16**
Significance Rating with Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**8**

8.5.2 SOIL CONTAMINATION

Nature (N)	Direct Negative impact on the site.		1
Extent (E)	Local: Impact to soil arising from the pipeline will be limited to the proximity of the pipeline.		2
Duration (D)	Moderate term: Only contaminated soil is not remediated the impact can be expected to remain for a long period of time depending on the nature of the contaminants.		3
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.		2
Probability (P)	Very likely: In the event of a leak or pipeline failure, there is a good chance of soil contamination occurring.		3
Mitigation (M)	Well mitigated: Pipes will be sealed but leakages can occur. Instrumentation should be in place to monitor any blockages or drops in pressure.		4
Enhancement (H)	N/A		-
Reversibility (R)	Moderately reversible: the impact requires that effort is taken immediately after the impact.		3
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	15
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	9

8.5.3 SURFACE WATER

Nature (N)	Negative impact on water quality.		1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.		1
Duration (D)	Short term: Due to the low frequency of rainfall and absence of surface drainage, it is unlikely that there would be any long-term surface water impacts.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected.		2
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.		1
Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.		4
Enhancement (H)	N/A		-
Reversibility (R)	Status quo will remain once operational.		1
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Low**	12
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	5

8.6 DECOMMISSIONING PHASE IMPACTS FOR THE WASTEWATER PIPELINE

8.6.1 MANAGEMENT AND DISPOSAL OF GENERAL WASTE

Nature (N)	Potential negative impact on water resource quality.	1
Extent (E)	Site: These activities will all occur within BRMO. BRMO operates a licensed general landfill that will receive all unrecyclable general waste.	1
Duration (D)	Long term: Waste will be permanently placed in landfill. Besides the landfill, impact on soil and water is only expected in the event of incorrect storage, transportation, or disposal of waste.	5

Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that have limited possibility of entering groundwater and would be in small quantities and of limited risk.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate waste storage skips and bins, which will largely eliminate the potential for soil and groundwater contamination. Disposal will be to the licenced BRMO landfill.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	24
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	12

8.6.2 MANAGEMENT AND DISPOSAL OF HAZARDOUS WASTE

Nature (N)	Potential negative impact on water resource quality.		1
Extent (E)	Provincial: Hazardous wastes are expected to be minimal. These will be managed via BRMO's hazardous waste transfer facility. Hazardous wastes would however be disposed or recycled in other provinces due to the lack of suitable facilities locally.		4
Duration (D)	Long term: Impact on soil and water is only expected in the event of a spill outside of the bunded storage areas or during transport. The subsequent impact on groundwater for example may remain for several years.		5
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected mainly due to the low quantities.		2
Probability (P)	Likely: The potential for incorrect storage of waste without proper mitigation and management in place is high.		3
Mitigation (M)	Can be well mitigated: Providing adequate bunded facilities, for storage will largely eliminate the potential for soil and groundwater contamination. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers. Using a suitable waste management contractor for transporting waste to licenced management facilities will also effectively reduce risk.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Moderate**	36
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	18

8.6.3 SOCIO-ECONOMIC

Nature (N)	Positive impact on job creation.		-0.25
Extent (E)	Local: Expected to have an impact within the surrounds local municipality.		2
Duration (D)	The duration of the decommissioning will be short term.		2
Intensity (I)	Moderate: The number of jobs created will not be large and these jobs will be temporary. It is likely that contractors with existing employees will largely be used.		3
Probability (P)	Definite: Impact will occur.		5
Mitigation (M)	N/A		-
Enhancement (H)	Moderate enhancement, in the form of the proponent making a concerted effort to employ workers from the surrounding areas, can be applied.		3
Reversibility (R)	N/A		N/A
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Moderate)**	-45

8.6.4 BIODIVERSITY

Nature (N)	Negative impact on vegetation.		-0.25
Extent (E)	Local: Pipeline to be revegetated upon decommissioning		2
Duration (D)	Very long term. Upon closure and decommissioning it is anticipated that the land will be returned to agricultural grazing land.		5
Intensity (I)	Moderate: Protected plant and tree species must be removed. It is not expected that the removal will result in a critical impact on species diversity and vulnerable ecosystems in isolation, but it is important to consider this impact in the context of the wider cumulative impact.		3
Probability (P)	Definite: Rehabilitation is a condition of the development and the rehab quantum		5
Enhancement (H)	N/A		1
Significance Rating - Positive Impact (S)	N x (E+D) x I x P x (H).	**Positive (Moderate)**	-26

8.6.5 GROUNDWATER CONTAMINATION

Nature (N)	Negative impact on water resource quality.		1
Extent (E)	Locally: Localised to the site and immediate surrounds.		2
Duration (D)	Long term: Only if a plume enters groundwater will it be a long process to remediate contaminated groundwater.		4
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may enter groundwater will be in small quantities.		2
Probability (P)	Unlikely: The probability of a significant spill-taking place during decommissioning is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such used oil and lubricants will in any case be stored in sealed drums/containers.		2
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Slightly reversible: Groundwater remediation is possible but is a lengthy and costly process.		2
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**16**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**8**

8.6.6 SOIL CONTAMINATION

Nature (N)	Direct Negative impact on the site.		1
Extent (E)	Local: Impact to soil arising from the pipeline will be limited to the proximity of the pipeline.		2
Duration (D)	Long term: Only contaminated soil is not remediated the impact can be expected to remain for a long period of time depending on the nature of the contaminants.		3
Intensity (I)	Minor: Natural processes or functions are not expected to be appreciably affected. Contaminants that may contaminate soil will be in small quantities.		2
Probability (P)	Very likely: The clearance of undisturbed land will occur. The probability of a significant spill taking place during construction is low. The probability of significant contamination from waste materials is also low as the majority of wastes are not hazardous. Hazardous waste such as used oil and lubricants will in any case be stored in sealed drums/containers.		3
Mitigation (M)	Well mitigated: Providing adequate bunded facilities, for storage will largely reduce the potential for contamination. There are many measures that can be implemented in order to prevent soil and groundwater contamination.		4
Enhancement (H)	N/A		-
Reversibility (R)	Moderately reversible: the impact requires that effort is taken immediately after the impact.		3
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**12**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**7**

8.6.7 NOISE

Nature (N)	Negative impact on site.		1
Extent (E)	On site: Localised to the site.		1
Duration (D)	Short term: Decommissioning phase anticipated to be up to 12 months.		2
Intensity (I)	Negligible: The facility is within a mining area and there are no nearby noise receptors outside of the facility.		1
Probability (P)	Definite: Noise will be generated by excavation and other equipment and activities.		5
Mitigation (M)	Well mitigated: To be limited to normal working hours, in accordance with locally applicable by-laws.		4
Enhancement (H)	N/A		-
Reversibility (R)	Reversible: The status quo will return to the previous status quo upon completion of construction.		4
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**6**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**4**

8.6.8 SURFACE WATER

Nature (N)	Negative impact on water quality.	1
Extent (E)	Site: there is no evidence of natural surface water or drainage on the site.	1
Duration (D)	Short term: Construction phase anticipated to be up to 12 months.	2
Intensity (I)	Negligible: Natural processes or functions are not expected to be appreciably affected.	1
Probability (P)	Very unlikely: There is no evidence of natural surface water or drainage on the site. The site has high infiltration and evaporation rates.	1
Mitigation (M)	Well mitigated: Effective procedures can be adopted to prevent contamination of surface water from the proposed activities.	3
Enhancement (H)	N/A	-

Reversibility (R)	Decommissioning will return environment to state as at time of commencement of construction activities.		1
Significance Rating without Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Negligible**	**3**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Negligible**	**2**

8.6.9 TRAFFIC

Nature (N)	Negative impact on traffic in the area.		1
Extent (E)	Local: The extent of the impact could affect activities outside of BRMO		2
Duration (D)	Short term: Short term impact of removing pipeline crossing the R380.		2
Intensity (I)	Minor: The majority of vehicular movement beyond the R380 crossing is linked to BRMO operations, although impact could also prevent access to Wessels, Goodrock Chemworks and Black Rock Village.		2
Probability (P)	Definite impact on R380		5
Mitigation (M)	Mitigation can be applied to ensure that activities are undertaken outside of peak traffic hours.		4
Enhancement (H)	N/A		-
Reversibility (R)	Upon completion of construction the impacts the status quo is expected to revert.		4
Significance Rating without Mitigation - Negative Impact (S)	N x (E+D) x I x P ÷ ½(R)	**Low**	**16**
Significance Rating with Mitigation -Negative Impact (S)	N x (E+D) x I x P ÷ ½(M+R)	**Low**	**10**

8.7 SUMMARY

A summary of the impact assessment outcomes id present in Table 8-1 below.

Table 8-1: Summary of scoping phase impact assessment for the Centralised Wastewater Treatment Works and Reverse Osmosis Plant

Phase	Impact	Without Mitigation	With Mitigation
Construction	Management and Disposal of General Waste	Moderate	Low
	Management and Disposal of Hazardous Waste	Moderate	Low
	Groundwater Contamination	Low	Negligible
	Soil Contamination	Low	Negligible
	Air Quality	Negligible	Negligible
	Noise	Low	Negligible
	Biodiversity	Moderate	Moderate
	Socio-Economic	Positive (Moderate)	Not Applicable
	Odour	Negligible	Negligible
	Visual/Aesthetic	Negligible	Negligible
	Heritage Resources	Low	Negligible
	Surface Water	Negligible	Negligible
	Traffic	Negligible	Negligible
Operation	Management and Disposal of Hazardous Waste from Sewage Treatment	Moderate	Low
	Management and Disposal of General Waste	Low	Negligible
	Groundwater Contamination	Moderate	Low
	Soil Contamination	Low	Negligible
	Noise	Negligible	Negligible
	Socio Economic	Positive (Negligible)	Not Applicable
	Odour	Moderate	Low
	Surface Water	Negligible	Negligible
Decommissioning	Management and Disposal of General Waste	Moderate	Low
	Management and Disposal of Hazardous Waste	Moderate	Low
	Groundwater Contamination	High	Moderate
	Soil Contamination	Low	Low
	Air Quality	Low	Low
	Noise	Negligible	Negligible
	Biodiversity	Positive (Moderate)	Not Applicable
	Socio-Economic	Positive (Moderate)	Not Applicable
	Odour	Negligible	Negligible

Table 8-2: Summary of scoping phase impact assessment for the Proposed wastewater pipeline to the centralised wastewater treatment works

Phase	Impact	Without Mitigation	With Mitigation
Construction	Management and Disposal of General Waste	Moderate	Low
	Management and Disposal of Hazardous Waste	Moderate	Low
	Socio-Economic	Positive (Moderate)	Not Applicable
	Biodiversity	Moderate	Moderate
	Groundwater Contamination	Low	Negligible
	Soil Contamination	Low	Negligible
	Noise	Low	Negligible
	Heritage Resources	Low	Negligible
	Biodiversity	Moderate	Moderate
	Surface Water	Negligible	Negligible
	Traffic	Low	Low
Operation	Groundwater Contamination	Moderate	Low
	Soil Contamination	Low	Negligible
	Surface Water	Negligible	Negligible
Decommissioning	Management and Disposal of General Waste	Moderate	Low
	Management and Disposal of Hazardous Waste	Moderate	Low
	Socio-Economic	Positive (Moderate)	Not Applicable
	Biodiversity	Positive (Moderate)	Not Applicable
	Groundwater Contamination	Low	Negligible
	Soil Contamination	Low	Negligible
	Noise	Negligible	Negligible
	Surface Water	Negligible	Negligible
	Traffic	Low	Low

9 PLAN OF STUDY FOR EIA

The Scoping and EIA process is summarised in Figure 9-1 below.

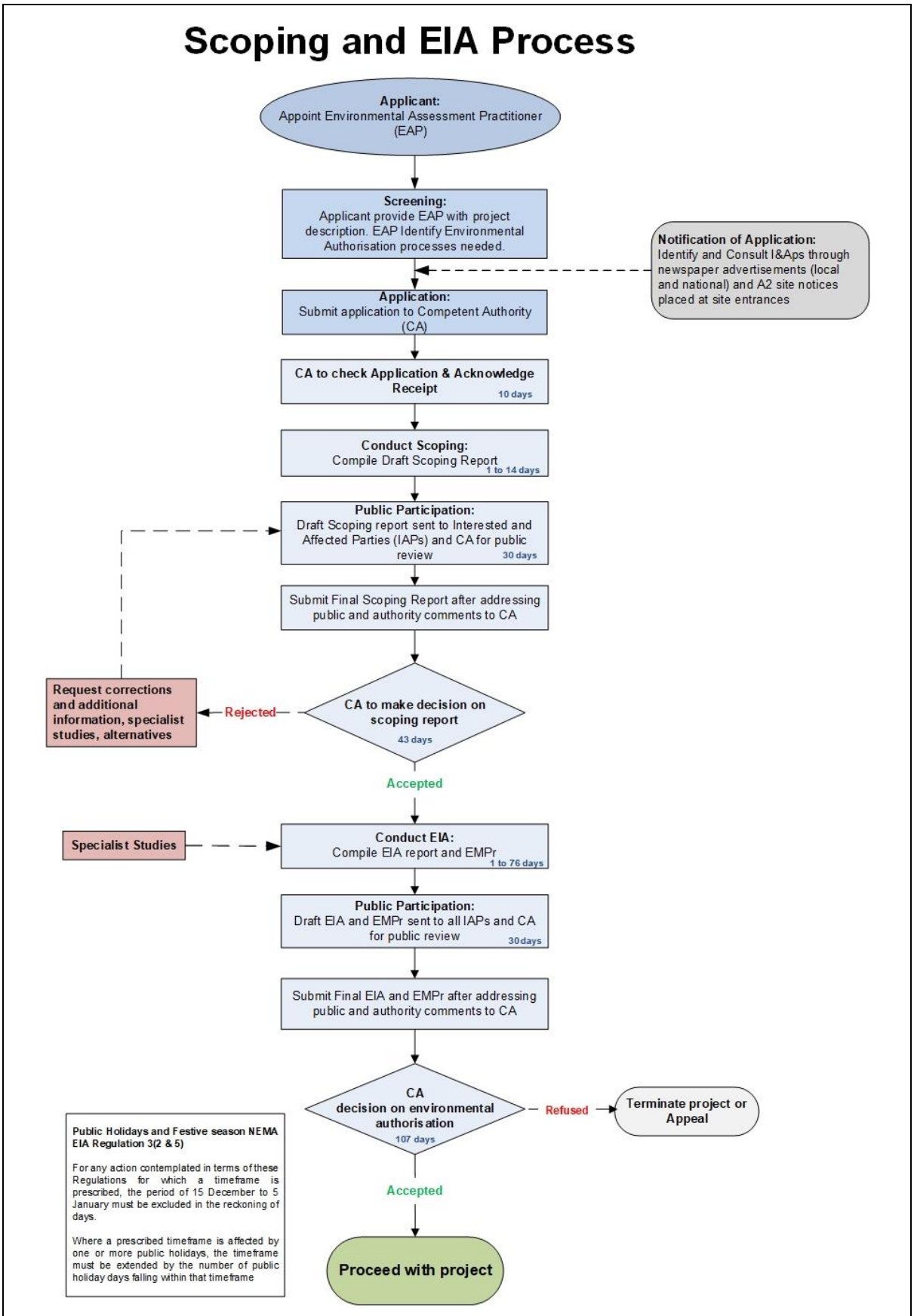

Figure 9-1: Scoping and EIA Process Summary

9.1 LEGAL REQUIREMENT FOR PLAN OF STUDY FOR EIA

This plan of study has been formulated to meet the requirements for a Plan of Study for Environmental Impact Assessment (EIA) as set out in Appendix 2(i) of GN R.982, which states:

"A plan of study for undertaking the environmental impact assessment process to be undertaken, including-

(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;

(ii) a description of the aspects to be assessed as part of the environmental impact

assessment process;

(iii) aspects to be assessed by specialists;

(iv) a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;

(v) a description of the proposed method of assessing duration and significance;

(vi) an indication of the stages at which the competent authority will be consulted;

(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and

(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;

(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored."

9.2 ALTERNATIVES TO BE CONSIDERED

A summary of alternatives to be considered is presented in Table 9-1with further details on the alternatives noted within the Section 2.3.

Table 9-1: Breakdown of considerations of alternatives

	Alternative 1 _Establishment of Centralised WWTW and RO Plant, with conveyance of Wastewater from existing facilities	Alternative 2 – Expansion of Black Rock WWTW and conveyance of excess wastewater to Black Rock for treatment.	No Go Alternative – Continued operation of existing facilities with no expansion or new development
Property or location alternatives	Property and locational alternatives at Black Rock Mine are to be assessed. Two routes for transfer of wastewater outlined from Gloria	Existing facilities locations to be used in addition to expansion of facilities at Black Rock.	Continued operations at existing WWTW with no additional site being required.
Design or layout of activity	The layout of the proposed activity is based on existing servitudes to allow for the efficient conveyance of wastewater with minimal requirement for the clearance or disturbance of vegetation. In terms of the location of the centralised STP and RO plant, are based on the proximity to the potential brine disposal site at the unused Black Rock tailings dams.	Layout remains as is, the exception being the potential expansion to Black Rock existing WWTW.	Current layout of operations remains unchanged
Type of activity	Various activities taking in place, including: • The development of a road, the development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or wastewater with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres. • The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation. • The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an	Expansion to wastewater treatment capacities includes: • The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution.	No new activities being undertaken.

	amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution. • The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent		
Technology to be used in the activity	Various technological alternatives are discussed further within Chapter 2.5 including Modified Ludzack-Ettinger (MLE) Process, Sequential Batch Reactor (SBR) and Integrated Fixed Film Activated Sludge (IFAS). Various piping alternatives will also be under consideration, such as the material that will be used	Existing operations include the established sequential batch reactors at all three mines. No implementation of the RO plant. Conveyance of wastewater still required to handle excess wastewater from Gloria and Nchwaning II WWTW.	Continuation of SBR operations at existing STPs.
Operational aspects of activity	Treatment of wastewater using MLE or SBR with further water treatment at the reverse osmosis plant. Additional conveyance of wastewater from various mines to centralised plant.	Continued treatment of wastewater using SBR. Conveyance of wastewater from Nchwaning and Gloria to Black Rock WWTW.	Continued treatment of wastewater using SBR.

9.3 SPECIALIST ASSESSMENTS

The identification and initial assessment of environmental aspects revealed the following potentially significant environmental aspects which require further detailed assessment, to be conducted during the EIA-phase. These are based on regulatory requirements as well as the impact assessment outcomes:

9.3.1 BIODIVERSITY IMPACT ASSESSMENT

Mucina & Rutherford describe the geology of the Kathu Bushveld as deep (>1.2 m) aeolian red sandy soils of Hutton and Clovelly soil forms, which was typical of the Kathu Bushveld Habitat unit associated with the focus area.

Previous studies have shown that a number of protected floral species have been recorded in the vicinity of the proposed development or have a high probability of occurring within these areas.

A Biodiversity Assessment will thus be required to identify and assess the potential impact on biota and propose management and mitigation measures. The study will have the following desired outcomes:

- To define the Present Ecological State (PES) of the terrestrial ecological resources associated with the study area;
- To determine and describe habitats, communities, and the ecological state of the study area;
- To conduct a faunal and floral Species of Conservation Concern (SCC) assessment, including the potential of suitable habitat to be associated with the study area;
- To identify and consider all sensitive landscapes including rocky ridges, wetlands and any other ecologically important features, if present;
- To determine the environmental impacts that the construction of the proposed mining-related development might have on the terrestrial ecology of the study area; and
- To develop mitigation and management measures for all phases of the development.

9.3.2 ARCHAEOLOGICAL IMPACT ASSESSMENT

A heritage impact assessment was undertaken in 2011 (Archaetnos Culture & Cultural report ASBR 2011) which employed literature review, filed surveys, review of oral histories. A total of 14 sites with a Stone Age origin were recorded during a specialist archaeological field survey of the Gamagara river basin. It is, however, envisaged that many more sites could still be uncovered in that area, with fairly dense grass cover in certain areas, as well as red Aeolian sand dunes, rendering them invisible at the time of the study. This area is currently under further investigation.

Stone Age artefacts are located in and on the river banks, and the likelihood of uncovering archaeological material is very high. A Phase II mitigation is currently being undertaken on some of the sites identified in the area to minimize the impact of the development. This will entail mapping of the sites, as well as controlled surface sampling of material.

Given the potential for identifying archaeological findings of significance, a full Archaeological Impact Assessment is proposed to identify and assess the potential for

sites/attributes of cultural and archaeological significance. The study will entail the following:

- Identify objects, sites, occurrences and structures of an archaeological or historical nature (cultural heritage sites) located on the property.
- Assess the significance of the cultural resources in terms of their archaeological, historical, scientific, social, religious, aesthetic and tourism value.
- Describe the possible impact of the proposed development on these cultural remains, according to a standard set of conventions.
- Recommend suitable mitigation measures to minimize possible negative impacts on the cultural resources by the proposed development.
- Review applicable legislative requirements.

9.3.3 PALAEONTOLOGICAL IMPACT ASSESSMENT

BRMO is underlain by the Cretaceous to Tertiary Kalahari Formation (Qs) and underlying Griqualand West Basin rocks, Transvaal Supergroup of Vaalian age.

The fossil assemblages of the Kalahari are generally very low in diversity, and occur over a wide range and thus the palaeontological diversity of this Group is low. These fossils represent terrestrial plants and animals with a close resemblance to living forms, refer to Table 9-2 Fossil assemblages include bivalves, diatoms, gastropod shells, ostracods and trace fossils.

Table 9-2: Fossil Heritage (adapated from Almond and Pether 2009)

Subgroup/ sequence	Group	Formation	Fossil Heritage	Comment
Tertiary-Quaternary	Kalahari	-	Terrestrial organisms	Trace fossils, ostracods, bivalves, gastropod shells, diatoms
Griqualand West Super Group	Campbell	Ghaapplato (Vgh)	Stromatolites	Cyanobacterial microfossils are present
-	Griquastad	Asbestos Hills	Stromatolites	Cynanobacterial microfossils are present

According to the SAHRIS palaeo-sensitivity map (Figure 9-2) there is very little chance of finding fossils in this area. A paleontological specialist will be required to undertake a desktop study of the area during the EIA phase.

Colour	Sensitivity	Required Action
RED	VERY HIGH	field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	desktop study is required
BLUE	LOW	no palaeontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	no palaeontological studies are required
WHITE/CLEAR	UNKNOWN	these areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 9-2: Extract of the SAHRIS PalaeoMap map (Council of Geosciences).

A desktop Palaeontological Impact Assessment is proposed to identify and assess the potential for sites/attributes of palaeontological significance and propose management and mitigation measures.

A report will be written including the following components:

- An introduction to the study;
- Description of the study methodology;
- An overview of the local and regional paleontological context applicable to the study area;
- A description of the potential impacts and an assessment of the significance of such impacts associated with the proposed project.
- Recommendations and conclusions of the study. This section will include an impact statement which summarizes all significant impacts identified.

9.3.4 WASTE ASSESSMENT

It is proposed that the WWTP Sludge and the dried salt waste (post evaporation pond) are assessed in accordance The National Norms and Standards for the Assessment of Waste for Landfill Disposal published in GN 635 of 2013, which requires that all wastes that are to be disposed of in landfills be assessed in terms of their composition and leaching properties.

This assessment will result in the designation of waste types, which then allows for the identification of appropriate landfill classes to which the wastes may be disposed as per The National Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013).

9.3.5 GEOHYDROLOGICAL IMPACT ASSESSMENT

A Geohydrological Assessment may be required to assess the potential for the brine evaporation ponds to impact on groundwater and identify management and mitigation measures.

The need for a Geohydrological Impact Assessment will be determined by the Department of Water and Sanitation after the preapplication meeting and site visit.

The objectives of this study, if required, will be to determine:

- Geohydrological properties of the strata within the zone that could potentially be affected by the quality of seepage;
- Vulnerability and existing potential use of the groundwater resource within the zone that could potentially be affected by the residue facility; and
- Potential rate of seepage from the facility and the quality of the seepage.
- A source-pathway-receptor risk assessment approach

9.4 IMPACT ASSESSMENT METHODOLOGY

The following criteria and methodology is proposed to determine the significance of environmental impacts that may result from the proposed project. Note that in instances where there are clear regulatory requirements and standards for specialist assessments, these will be employed at the discretion of the specialist, and the result incorporated into the Environmental Impact Report. In such cases the methodology below may not be applicable.

9.4.1 TYPE/NATURE OF IMPACTS

Potential environmental impacts may either have a positive or negative effect on the environment, and can in general be categorised as follows:

a) Direct/Primary Impacts

Primary impacts are caused directly due to the activity and generally occur at the same time and at the place of the activity.

b) Indirect/Secondary Impacts

Secondary impacts induce changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken.

c) Cumulative Impacts

Cumulative impacts are those that result from the incremental impact of the proposed activity on common resources when added to the impacts of the other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time, and can include both direct and indirect impacts.

9.4.2 DETERMINING SIGNIFICANCE

The following criteria will be used to determine the significance of an impact. The scores associated with each of the levels within each criterion are indicated in brackets after each description [like this].

9.4.2.1 Nature

Nature (N) considers whether the impact is:

Positive [- ¼]

Negative [+1].

9.4.2.2 Extent

Extent (E) considers whether the impact will occur:

- on site [1]
- locally: within the vicinity of the site [2]
- regionally: within the local municipality [3]
- provincially: across the province [4]
- nationally or internationally [5].

9.4.2.3 Duration

Duration (D) considers whether the impact will be:

- very short term: a matter of days or less [1]
- short term: a matter of weeks to months [2]
- medium term: up to a year or two [3]
- long term: up to 10 years [4]
- very long term: 10 years or longer [5].

9.4.2.4 Intensity

Intensity (I) considers whether the impact will be:

- negligible: there is an impact on the environment, but it is negligible, having no discernible effect [1]
- minor: the impact alters the environment in such a way that the natural processes or functions are hardly affected; the system does however, become more sensitive to other impacts [2]
- moderate: the environment is altered, but function and process continue, albeit in a modified way; the system is stressed but manages to continue, although not with the same strength as before [3]
- major: the disturbance to the environment is enough to disrupt functions or processes, resulting in reduced diversity; the system has been damaged and is no longer what it used to be, but there are still remaining functions; the system will probably decline further without positive intervention [4]
- severe: the disturbance to the environment destroys certain aspects and damages all others; the system is totally out of balance and will collapse without major intervention or rehabilitation [5].

9.4.2.5 Probability

Probability (P) considers whether the impact will be:

- very unlikely: the possibility of the impact occurring is very low, due either to the circumstances, design or experience [1]
- unlikely: the possibility of the impact occurring is low, due either to the circumstances, design or experience [2]
- likely: there is a possibility that the impact will occur, to the extent that provisions must be made for it [3]
- very likely: the impact will probably occur, but it is not certain [4]
- definite: the impact will occur regardless of any prevention plans, and only mitigation can be used to manage the impact [5].

9.4.2.6 Mitigation or Enhancement

Mitigation (M) is about eliminating, minimising or compensating for negative impacts, whereas enhancement (H) magnifies project benefits. This factor considers whether –

A negative impact can be mitigated:

- unmitigated: no mitigation is possible or planned [1]
- slightly mitigated: a small reduction in the impact is likely [2]
- moderately mitigated: the impact can be substantially mitigated, but the residual impact is still noticeable or significant (relative to the original impact) [3]
- well mitigated: the impact can be mostly mitigated and the residual impact is negligible or minor [4]

A positive impact can be enhanced:

- unenhanced: no enhancement is possible or planned [1]
- slightly enhanced: a small enhancement in the benefit is possible [2]
- moderately enhanced: a noticeable enhancement is possible, which will increase the quantity or quality of the benefit in a significant way [3]
- well enhanced: the benefit can be substantially enhanced to reach a far greater number of receptors or recipients and/or be of a much higher quality than the original benefit [4].

9.4.2.7 Reversibility

Reversibility (R) considers whether an impact is:

- irreversible: no amount of time or money will allow the impact to be substantially reversed [1]
- slightly reversible: the impact is not easy to reverse and will require much effort, taken immediately after the impact, and even then, the final result will not match the original environment prior to the impact [2]
- moderately reversible: much of the impact can be reversed, but action will have to be taken within a certain time and the amount of effort will be significant in order to achieve a fair degree of rehabilitation [3]
- mostly reversible: the impact can mostly be reversed, although if the duration of the impact is too long, it may make the rehabilitation less successful, but otherwise a satisfactory degree of rehabilitation can generally be achieved quite easily [4].

9.4.3 CALCULATING IMPACT SIGNIFICANCE

Significance is determined through the integration of impact characteristics in terms of the above-mentioned variables, resulting in a rating of high, medium or low significance. Impact significance is assigned both with and without mitigation, and the measures or outcome of mitigation or optimisation of impacts highlighted. The table below summarises the scoring for all the criteria.

Table 9-3: Scoring for Significance Criteria

CRITERION	SCORES					
	- ¼	1	2	3	4	5
N-nature	positive	negative	-	-	-	-
E-extent	-	site	local	regional	provincial	national
D-duration	-	very short	short	moderate	long	very long
I-intensity	-	negligible	minor	moderate	major	severe
P-probability	-	very unlikely	unlikely	likely	very likely	-
M-mitigation	-	none	slight	moderate	good	-
H-enhancement	-	none	slight	moderate	good	-
R-reversibility	-	none	slight	moderate	good	-

Impact significance is a net result of all the above criteria. The formula proposed to calculate impact significance (S) is:

- For a negative impact: S = N x (E+D) x I x P ÷ ½(M+R); and
- For a positive impact: S = N x (E+D) x I x P x (H).

Negative impacts score from 2 to 200. Positive impacts score from – ½ to -200.
Significance ratings are thus broadly defined as follows:
a) High - Impacts would be of a high significance if the following impact profile applies:

- the extent is local to international;
- the duration is long term to permanent;
- the ecological or social system will be affected to the point of collapse.

b) Medium - Impacts are considered moderately significant if the following applies:

- the extent is local to regional;
- the duration is medium- to long term;
- the ecological or social system will be affected but continue to function.

c) Low - Impacts of a low significance are identified according to the following profile:

- the extent is local or site specific;
- the duration is temporary to permanent;
- the ecological or social system will not be affected.

9.4.4 UNDERSTANDING IMPACT SIGNIFICANCE

The following is a guide to interpreting the final scores of an impact (for negative impacts):

Table 9-4: Final Significance Scoring		
Final score (S)	Impact significance	
0 – 10	negligible	the impact should cause no real damage to the environment, except where it has the opportunity to contribute to cumulative impacts
10 – 20	Low	the impact will be noticeable but should be localized or occur over a limited time period and not cause permanent or unacceptable changes; it should be addressed in an EMP and managed appropriately
20 – 50	moderate	the impact is significant and will affect the integrity of the environment; effort must be made to mitigate and reverse this impact; in addition, the project benefits must be shown to outweigh the impact
50 – 100	High	the impact will affect the environment to such an extent that permanent damage is likely and recovery will be slow and difficult; the impact is unacceptable without real mitigation or reversal plans; project benefits must be proven to be very substantial; the approval of the project will be in jeopardy if this impact cannot be addressed

Table 9-4: Final Significance Scoring		
Final score (S)	Impact significance	
100 – 200	severe	the impact will result in large, permanent and severe impacts, such as, local species extinctions, minor human migrations or local economic collapses; even projects with major benefits may not go ahead with this level of impact; project alternatives that are substantially different should be looked at, otherwise the project should not be approved

9.4.5 IMPACT MITIGATION/OPTIMISATION

Mitigation seeks to find ways of minimising the significance of, or eliminating, negative impacts, whereas optimisation enhances project benefits. Under each impact a summary is given of management actions recommended for the purpose of preventing or reducing the negative effects, or enhancing the positive benefits of the development.

Mitigating/optimising measures to be implemented will be assimilated into the Environmental Management Programme.

9.5 CONSULTATION WITH THE COMPETENT AUTHORITY

The proposed consultation with the competent authority is shown in Table 9-5.

Table 9-5: Authority Consultation	
Phase	**Details**
Application	Lodge application and declaration of interest – **COMPLETE (Application submitted 22 July 2021)**
	Receive confirmation of application - **CURRENT**
Scoping	Lodge Scoping Report (Including Plan of Study for EIA) - **CURRENT**
	Consideration of Scoping Report and PoS for Environmental Impact Assessment
	Authority site visit if required
	Receive confirmation of acceptance of Scoping Report and PoSEIA
EIR	Lodge Environmental Impact Assessment Report
	Receive confirmation of acceptance of EIR
	Authority site visit if required
	Decision on application

9.6 PUBLIC PARTICIPATION PROCESS

The proposed public participation process for the remainder of the Environmental Impact Assessment will consist of:

- Presenting registered Interested and Affected Parties and stakeholders with the opportunity to read and comment on environmental impact assessment report including specialist reports;

- Presenting registered Interested and Affected Parties and stakeholders with the opportunity to read and comment on draft environmental management plans compiled in terms of regulation;
- A public meeting to present and discuss the findings of the Environmental Impact Assessment and related specialist reports (if enough interest)

10 WAY FORWARD

Based on the independent evaluation and assessment of the proposed project during the Scoping Phase by the Environmental Assessment Practitioner (EAP), a Plan of Study for Environmental Impact Assessment (PoSEIA) has been developed. The POSEIA would inform the accurate assessment and mitigation of potential environmental impacts that may arise from the proposed project. This would result in the compilation of a detailed EIA Report that would allow the competent authority (DMR) to make an informed decision regarding the authorisation of the proposed project, or components thereof.

The EAP also believes that the information provided in this Scoping Report is sufficient/substantive, at a scoping stage, for I&APs to contribute meaningfully to the EIA process (as required by the EIA Regulations) and for the CA to make an informed decision as to whether, or not, the EAP can proceed to the EIA phase of the application process. It is, therefore, the EAPs recommendation that the CA approve this Scoping Report and Plan of Study for EIA (PoS), based on the content provided in the report itself and the procedure followed in compiling this Scoping Report.

11 AFFIRMATION BY EAP

EScience Associates (Pty) Ltd, as the Environmental Assessment Practitioner, led by Abdul Ebrahim hereby affirms that:

- The information herein is true and correct to the best of our knowledge;
- The EAP has kept a register of all interested and affected parties that participated in a public participation process;
- The EAP has ensured that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties has been facilitated in such a manner that all interested and affected parties have been provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- The Plan of Study that has been presented In the Scoping Report was distributed to Interested and Affected parties with the Scoping Report and no comments or objections thereto have been received, the EAP therefore concludes that the Plan of Study presented is of an acceptable standard.

12 DECLARATION BY EAP

EScience Associates (Pty) Ltd, as the Environmental Assessment Practitioner, led by Abdul Ebrahim hereby affirms that:

- The information herein is true and correct to the best of our knowledge;
- The EAP has kept a register of all interested and affected parties that participated in a public participation process;
- The EAP has ensured that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties has been facilitated in such a manner that all interested and affected parties have been provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- The EAP has included all comments and inputs made by stakeholders and interested and affected parties as well as the competent authority. Responses to comments are appended to this Environmental Impact Report.

Abdul Ebrahim

_____

NAME OF EAP

2021/08/05

_____ _____

SIGNATURE OF EAP DATE

APPENDIX 1: EAP CURRICULUM VITAE

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Curriculum Vitae:

Abdul Ebrahim

Surname: Ebrahim
Name: Abdul
Date of birth: 07 December 1977
Residency: RSA
Position: Director
Key Qualifications: BEng (Hons) Environmental, BEng (Hons) Mechanical

Contact details

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Abstract

Abdul Ebrahim is a director of EScience Associates, an environmental consultancy specialising in waste and waste recovery, effluent, atmospheric emissions and air quality, as well as cleaner and renewable energy. EScience Associates caters for a diversity of industries and economic sectors and has forged strong relationships with other specialists, and specialist agencies, allowing the company to deal with complex and contentious environmental problems.

Abdul Ebrahim holds a BEng (Hons) in both Mechanical and Environmental Engineering disciplines. He specialises in air quality management, hazardous waste management and cleaner production, as well as their related environmental authorisation and licensing processes. His work experience includes numerous environmental impact assessments, cleaner production, waste recover-recuse-recycling, hazardous waste management assessments, and air quality impact management projects in power generation, manufacturing, minerals processing, and mining industries. His interests range from atmospheric modelling and wind energy, to the beneficial use of industrial wastes and effluents.

He is a certified Environmental Assessment Practioner (EAP) and member of amongst other professional organisations: Engineering Council of South Africa (ECSA), and the National Association of Clean Air (NACA).

Abdul has provided Honours level lecturing at the University of Pretoria, UNISA, Cape Town University of Technology and various private training institutions in the fields of Environmental Compliance Enforcement, Environmental Impact Assessment, Cleaner Production and Air Quality Management since 2005.

His work experience includes:

- Waste management (classification, handling, storage, and disposal requirements, development of waste minimisation treatment & recycling strategies);
- Air quality management and Air Quality Management Plan development (industrial, household fuel burning, biomass burning and waste burning emissions modelling and inventorisation, development of emissions abatement and management strategies; meteorological and air quality modelling and impact assessment);
- Environmental Authorisation, Waste Management Licensing, Atmospheric Emissions Licensing, Mine Environmental Management Programme development, and their relating environmental impact assessment and stakeholder engagement processes.
- Development of specialist training courses (including EIA Administration and Review, Environmental Enforcement, Environmental Compliance Achievement for Industry).
- Environmental Due Diligence – due diligence assessment to inform purchase or ownership transfer of existing going concerns or proposed new establishments.

Abdul has over 15 years post graduate experience of which four years are in industry, and the remainder in consulting.

Education

BEng (Hons) Mechanical Engineering
BEng (Hons) Environmental Engineering

Languages

English (excellent speaking and writing) Limited French and Portuguese

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Curriculum Vitae:

Abdul Ebrahim

Experience

Personal work experience includes:

- Cleaner and renewable energy strategy development, plan and project development;
- Technical and environmental due diligence – industrial and energy projects
- Waste management (classification, handling, storage, and disposal requirements;
- Development of waste minimisation treatment & recycling strategies);
- Air quality management and emissions inventorying, development of abatement and management strategies;
- Environmental Impact Assessment and Permitting
- Development and dissemination of specialist training for government and the private sector at NQF level 7 (honours degree).

Abdul's work experience in a wide diversity of economic sectors and industries and provides him with a good understanding of both small scale and large scale impacts of waste and pollution, as well as keeping up to date with various management alternatives available and their individual advantages and disadvantages, both locally and internationally implemented and pilot scale. Various waste streams have been dealt with to determine the most applicable disposal methods and impacts on the environment, from various industries:

- Metallurgical processes
- Power generation
- Food processing
- Waste recovery, reuse, and recycling and waste to energy
- Mining
- Cement manufacturing
- General Commercial – General waste management from various industries

Professional Registration

Environmental Assessment Practioner (EAP)
Engineering Council of South Africa (ECSA

Hourly Rate

Nature of expertise offered

- Ability to interpret and analyse technical material on wide range of subjects
- Engineering expertise in energy, waste, air quality and multi-disciplinary subjects
- Ability to undertake technology feasibility studies, technical and financial due diligence
- Understanding of the green economy and technologies, ICT and agricultural and agro-processing sectors
- Ability to undertake a market research and investigation into the industry
- Proposal evaluation expertise

Experience and relevant projects

1. AIR QUALITY MANAGEMENT:

1.1 Government & Regulatory

- Vaal Triangle Air-shed Priority Area - Air Quality Management Plan review, development of emissions inventory and Ambient Air Quality Impact Assessment.
- Highveld Priority Area Air Quality Management Plan – development of emissions inventory, and mitigation strategies.
  - Reference: Dr Thulile Mdluli

  - Tel: 012 310 3436
  - Email : tmdluli@environment.gov.za
- Ekurhuleni Metropolitan Municipality - Development of an Air Quality Management Plan (AQMP)
  - Reference: Mr Edmund van Wyk
  - Tel: 011 999 2470
  - Email: Edmund.vWyk@ekurhuleni.gov.za
- Nkangala District Municipality - Development of an Air Quality Management Plan (AQMP)
  - Reference: Mr Vusi Mahlangu
  - Tel: 013 249 2164
  - Email: Mahlangumv@nkangaladm.gov.za
- North West Province - development of provincial emissions inventory (PM, NOx, SO_2 etc)
- Development of National Air Quality Officers Companion Guide for the Republic of South Africa
- Development of the atmospheric emissions licensing department for Nkangala District Municipality
- EThekwini Municipality (Durban) - Greenhouse gas emissions quantification
- Newcastle Local Municipality - Development of an Air Quality Management Plan (AQMP)
  - Reference: Mr Phelelani Ntshingila
  - Tel: 034 328 3300
  - Phelelani.Ntshingila@newcastle.gov.za

1.2 Industrial and Mining

- A large variety of major industrial and mining operation across the Highveld and Vaal Triangle as part of Highveld Priority Area and Vaal Triangle Air-shed Priority Area AQMP projects.
- Lanxess CISA Chrome Chemicals Plant Expansion, CO_2 generation, Power Generation and hazardous waste treatment and recovery
- Samancor Chrome Proposed Chrome Chemicals plant
- Karbochem (Synthetic Rubber Manufacture) proposed Power Generation Plant
- PPC Cement Slurry Cement Plant Expansion
- PPC Cement Jupiter Cement Plant Expansion
- PPC Cement PE Cement Plant Expansion
- PPC Cement Dwaalboom waste heat recovery
- PPC Cement De Hoek, PE, Slurry, and Dwaalboom postponement applications
- Afrisam Cement - Dudfield Environmental Management Programme update.
- ClinX Medical Waste Incineration plant expansion
- Goedemoed organic waste incineration
- AWPP pyrolysis of organic waste
- Interwaste Waste Recovery, Waste to Energy and Waste Incineration plant
- Eskom power generation emissions off-setting
- Hayes Lemmerz SA Aluminium Wheel Manufacturing
- Evraz Highveld Steel and Vanadium proposed Powered Generation - Furnace Off-Gases
- Assmang Ferrochrome and Ferromanganese plants Powered Generation - Furnace Off-Gases
- Resource Generation Proposed Boikarabelo Power Station – coal fired
- Weir Minerals Africa (Isando, Alrode and Heavy Bay Foundries)
- Goedemoed Prison proposed Waste incineration and Landfill
- Consolidated Wire Industries Expansion
- Sylvania Proposed Open Cast PGE Mine and Processing Plant
- Assmang Black Rock proposed manganese mine expansion and sinter plant
- Assmang machadodorp proposed smelter plant expansion and cross-over to manganese

- Dwarsrivier Chrome Mine
- Nkwe proposed Platinum Mine
- Agricultural Research Commission hazardous and infectious waste incineration
- Sephaku Aganang proposed use of AFR's in cement manufacture
- Idwala Phalaborwa atmospheric emission licence for magnetite drying
- Mandini Wealth (Pty) Ltd Air quality health risk assessment
- Johnson Tiles a Division of Norcros Sa (Pty) Ltd Air quality health risk assessment
- Lanxess CISA (Pty) Ltd Air quality health risk assessment

2. WASTE CLASSIFICATION, HAZARD RISK ASSESSMENT AND MANAGEMENT

- Weir Minerals Africa
- Heavy Bay foundry Port Elizabeth
- Lafarge Gypsum
- Consolidated Wire Industries
- BPB Gypsum
- PG Bison melamine plant
- ABBW Electrical manufacturing plant
- CBI copper and fibre optical cable manufacture
- Holcim Cement
- Lanxess Chrome Chemicals
- Assmang Chrome
- Assmang Manganese
- Hayes Lemmerz SA Aluminium Wheel Manufacturing
- Auto industrial group (Pty) Ltd
- CBI Electrical
- Various metal ore mines

3. ENVIRONMENTAL IMPACT ASSESSMENT:

- Highveld Steel furnace off-gas power generation
- Lanxess CISA chrome chemicals plant development
- Samancor chrome chemicals plant development
- Hernic Ferrochrome power generation from furnace off-gases
- Kanhym Biogas project
- Turfontein Race Course night racing
- Alumicor secondary aluminium recovery rotary salt furnaces
- Hays Lemmerz Aluminium smelters, furnace and alloy die casting
- Plettenburg Polo Estates
- PG Bison Decorative Panels
- British Aerospace Land Based OMC Systems
- BPB Gypsum phosphogypsum plant
- Extrupet HPDE and PET recycling plants
- Assmang BRMO
- Assmang Machadodorp
- Interwaste waste recovery and waste to energy plants
- PPC Cement
- ClinX Healthcare Risk Waste Management

EScience Associates
9 Victoria Road, Oaklands
Johannesburg, 2192
Tel: +27 (0)11 718 6380

Curriculum Vitae:

Abdul Ebrahim

4. ENVIRONMENTAL LEGAL COMPLIANCE ASSESSMENT & RECTIFICATION PLANNING:

- SASOL Synfuels
- NATCOS Petrochem
- Dwarsrivier Chrome Mine
- Angloplatinum Base Metals Recovery
- Samancor Hotazel Manganese Mines
- PG Bison (Pty) Ltd MDF manufacturing
- Samancor Manganese Division Samancor Metalloys Meyerton
- Holcim SA (Pty) Ltd Cement Plants:
  - DUDFIELD
  - ULCO
  - ROODEPOORT
- Natal Portland Cement Plants:
  - NEWCASTLE
- Consolidated Wire Industries
- South African Airways (Pty) Ltd Technical Division
- TWK forestry strategic environmental legal compliance assessment
- Inergy Automotive Systems(Pty) Ltd
- Consolidated Wire Industries
- Mittal Steel Vereeninging and Dunswart plants – specialist assistance to DEAT environmental management inspectors
- Assmang Black Rock Mining Operations
- ClinX Medical Waste Management
- Extrupet PET and HDEP recycling plants
- Scaw Metals High Chromium Ball Plant
- Unilever waste recovery, recycling, and zero waste-to-landfill
- Numerous waste recycling facilities
- Oilflow
- The Smart Company
- Darkling Industrial Metals CC
- Unilever waste recovery, recycling, and zero waste-to-landfill
- Central Waste
- AT Packaging
- EWaste Africa
- Mpact Recycling
- Wasteplan
- Fine Metals
- Living Earth
- Industrial Plastic Recyclers
- SA Paper Mills
- Interwaste
- Matchem
- TGS
- Verigreen
- SB Boxes
- Drumpal
- Oscars Meat
- FOSECO South Africa (Pty) Ltd
-

5. GREENHOUSE GAS Quantifications and Assessments

- PPC Riebeeck

- Lafarge Licthenburg
- Ilangabi Investments 12 (Pty) Ltd
- Lanxess CISA (Pty) Ltd

6. CLEANER PRODUCTION AUDITS, WASTE TO ENERGY, ENERGY RECOVERY, WASTE RECOVERY AND RELATED PROJECTS:

- Tuffy Plastics
- Proplas plastics
- WHS Distribution
- Premier Foods Pretoria Wheat Mill
- Alfred Nzou municipality
- Lanxess chrome chemicals residue recovery
- Karbochem power generation ash to bricks project
- Cement kilns alternative fuels and raw materials assessment for South Africa
- Kanhym Estates Biogas Generation from piggery effluent
- British American Tobacco:
- Tobacco Processors Zimbabwe
- Souza Cruz Brazil

7. ENVIRONMENTAL MANAGEMENT SYSTEM DEVELOPMENT & IMPLEMENTATION:

- British American Tobacco (full system development from scratch – ISO 14001 and ISO 9001)
  - Weir Minerals Aspects Identification, Rating, Assessment and Development of EMPs
  - Lafarge Gypsum Aspects Identification, Rating, Assessment and Development of EMPs
  - Environmental Aspects Identification, rating and formulation of EMPs for Samancor Metalloys Meyerton
  - Environmental Aspects Identification, rating and formulation of EMPs for DMS Powders.
  - Holcim Slagment development & implementation of EMS components including waste and air quality management
  - Holcim Roodepoort development & implementation of EMS components including waste and air quality management
  - Consolidated Wire Industries Environmental Aspects Identification, rating and formulation of EMPs and operational control procedures.
  - Samancor Metalloys Ferro Silicon Manganese and FerroSilicon production
  - DMS FeSi dense media prodcution

8. ISO14001 AUDITING:

- Debswana Orapa and Letlhakane Mines
- Ingwe Colliery
- Arnot Colliery
- FOSECO South Africa (Pty) Ltd
- Lafarge Gypsum
- CWI

9. SPECIALIST TRAINING COURSE DEVELOPMENT & PRESENTATION

- 2011 Training of Atmospheric Emissions Licensing Authorities – air quality management, emissions quantification, regulation and enforcement.

- 2007-2015 Training of Authorities for EIA review and permiting

Responsible for development of NEMA EIA Review Course and Administrators EIA Review Manual, theoretical and practical training material, and training of Government Officials responsible for EIA Review - responsible for the whole

manual other than Law applicable to EIA Review. As at May 2013 approximately 1000 officials from National, Provincial and Local Government.

- 2005&6 Bridging Training for Environmental Management Inspectors and Enforcement

ESA was part of a consortium selected to develop and conduct the EMI Training. More than 2000 officials and university students have completed the training.

- University Of Pretoria Specialist Lecturer

- Environmental Legal Compliance inspections and investigations (RSA)
- Environmental Legal Compliance achievement (RSA)
- Environmental Legal Compliance inspections and investigations (Africa)

- University Of South Africa Specialist Lecturer

- Environmental Legal Compliance inspections and investigations (RSA)

- Training for industry and mining

Development and presentation of training material for environmental impact identification and management in terms of South African environmental law for the SABS and other training institutions.

10. <u>SOIL AND GROUNDWATER CONTAMINATION ASSESSMENT:</u>

- Weir Heavy Bay Foundry
- Lafarge Gypsum
- Kanhym Estates
- SABAT (Pty) Ltd Johannesburg – investigation of heavy metal contamination of soils and groundwater
- Chemiphos SA (Pty) Ltd – investigation of phosphate and heavy metal contamination of soils and groundwater
- Castrol Lubricants Zimbabwe

11. <u>ENVIRONMENTAL DUE DILIGENCE AUDITS, INCLUDING ASSESSMENT OF ENVIRONMENTAL AND CLOSURE LIABILITY:</u>

- Determination and quantification of financial provision for the environmental rehabilitation and closure requirements of smelting operations for Highveld Steel & Vanadium operations:
  - HIGHVELD IRON AND STEEL WORKS
  - VANCHEM
  - TRANSALLOYS
  - RAND CARBIDE
  - MAPOCHS MINE

- Determination and quantification of financial provision for the environmental rehabilitation and closure requirements of smelting operations for TransAlloys
- Determination and quantification of financial provision for the environmental rehabilitation and closure requirements of mining operations for Samancor Chrome:

- MIDDELBURG FERROCHROME
- FERROMETALS
- TUBATSE FERROCHROME
- WESTERN CHROME MINES
- EASTERN CHROME MINES

- Determination of critical environmental liability associated with the purchase of Xmeco Foundry by Weir Minerals Africa, and subsequent legal compliance achievement programme

12.

Possible timelines to commit to the assignment

- Available for assignments over the next two years
- Not available during the December holiday period - from 15 December until 3 January – due to company's closure for the festive season

EScience Associates
9 Victoria Road, Oaklands
Johannesburg, 2192
Tel: +27 (0)11 718 6380

Curriculum Vitae:

Sam Leyde

Surname: Leyde
Name: Sam
Date of birth: 25 November 1985
Nationality: RSA
Position: Environmental Consultant
Key Qualifications: BSc(hons) Mechanical Engineering

Contact details

☎: 011 7186380
✉: sam@escience.co.za

Abstract

Sam Leyde is an employee of EScience Associates, an environmental consultancy specialising in waste and waste recovery, effluent, atmospheric emissions and air quality, as well as cleaner and renewable energy. EScience Associates caters for a diversity of industries and economic sectors and has forged strong relationships with other specialists, and specialist agencies, allowing the company to deal with complex and contentious environmental problems.

Sam Leyde holds a BSc (Hons) in Mechanical Engineering. He specialises environmental authorisation and licensing processes. His work experience includes numerous environmental impact assessments, , waste recover-recuse-recycling, waste disposal and classification assessments, and air quality impact management projects in the manufacturing sector.

Sam has 8 years post graduate experience of which 7 years are in industry, and the remainder in engineering.

Education

BSc (Hons) Mechanical Engineering

Languages

English (excellent speaking and writing)

Experience

Personal work experience includes:

- Environmental Authorisation, Waste Management Licensing, Atmospheric Emissions Licensing, Environmental Management Programme development, and their relating environmental impact assessment and stakeholder engagement processes.
- Waste management (classification, handling, storage, and disposal requirements, development of waste minimisation treatment & recycling strategies);
- Air Quality Impact Assessments;
- External Environmental Auditing – due diligence assessment to inform purchase or ownership transfer of existing going concerns or proposed new establishments.

Experience and relevant projects

1. **ENVIRONMENTAL IMPACT ASSESSMENT:**
    - EIA for Sephaku Aganang proposed use of AFR's in cement manufacture
    - EIA for PPC Cement Slurry Cement Plant Expansion
    - Extrupet HPDE and PET recycling plants
    - Assmang Machadodorp Reverse Osmosis Plant and Stormwater Upgrades;
    - Interwaste Waste Recovery and Waste to Energy Plant
    - ClinX Healthcare Risk Waste Management

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Johannesburg, 2192
Tel: +27 (0)11 718 6380

Curriculum Vitae:

Sam Leyde

Experience and relevant projects

- EIA for proposed Refuse Derived Fuel Energy Recovery Facility, Athlone, Cape Town;
- EIA for proposed pyrolysis of organic/abattoir waste – Square Root Trading Seven, Kroonstad;
- EIA for Interwaste proposed Waste to Energy and Waste Incineration plant;
- EIA Sylvania Proposed Open Cast PGE Mine and Processing Plant;
- EIA for Assmang Machadodorp proposed water treatment plant;
- Basic Assessment for Assmang Machadodorp Storm Water management upgrades;
- Water Use License Application for Assmang Machadodorp Storm Water management upgrades and water treatment facility;
- Water Use Licence for SA Dorper Leather Tannery;
- Oilflow oil blending facility
- The Smart Company Copper melting facility
- Darkling Industrial Metals CC – Scrap Metal Recovery Facility

2. ENVIRONMENTAL LEGAL COMPLIANCE AUDITING & RECTIFICATION PLANNING:

- FFS Refiners, Storage facility Evander 2013 and 2019
- Assmang Black Rock Mining Operations
- ClinX Medical Waste Management
- Extrupet PET and HDEP recycling plants
- Scaw Metals High Chromium Ball Plant
- Oilflow oil blending facility
- The Smart Company Copper melting facility
- Darkling Industrial Metals CC – Scrap Metal Recovery Facility

3. AIR QUALITY MANAGEMENT:

- AQIA for Sephaku Aganang proposed use of AFR's in cement manufacture
- AQIA for PPC Cement Slurry Cement Plant Expansion
- Lanxess CISA Chrome Chemicals Plant Expansion, CO_2 generation, Power Generation and hazardous waste treatment and recovery
- ClinX Medical Waste Incineration plant expansion
- Interwaste Waste Recovery, Waste to Energy and Waste Incineration plant
- Weir Minerals Africa (Isando, Alrode and Heavy Bay Foundries)
- Sylvania Proposed Open Cast PGE Mine and Processing Plant
- Agricultural Research Commission hazardous and infectious waste incineration
- Johnson Tiles a Division of Norcros Sa (Pty) Ltd Air quality health risk assessment
- Proposed pyrolysis of organic/abattoir waste – Square Root Trading Seven, Kroonstad;

4. WASTE CLASSIFICATION, HAZARD RISK ASSESSMENT AND MANAGEMENT

- Weir Minerals Africa
- Wispeco Aluminium

APPENDIX 2: PUBLIC PARTICIPATION

APPENDIX 2.1: SITE NOTICES

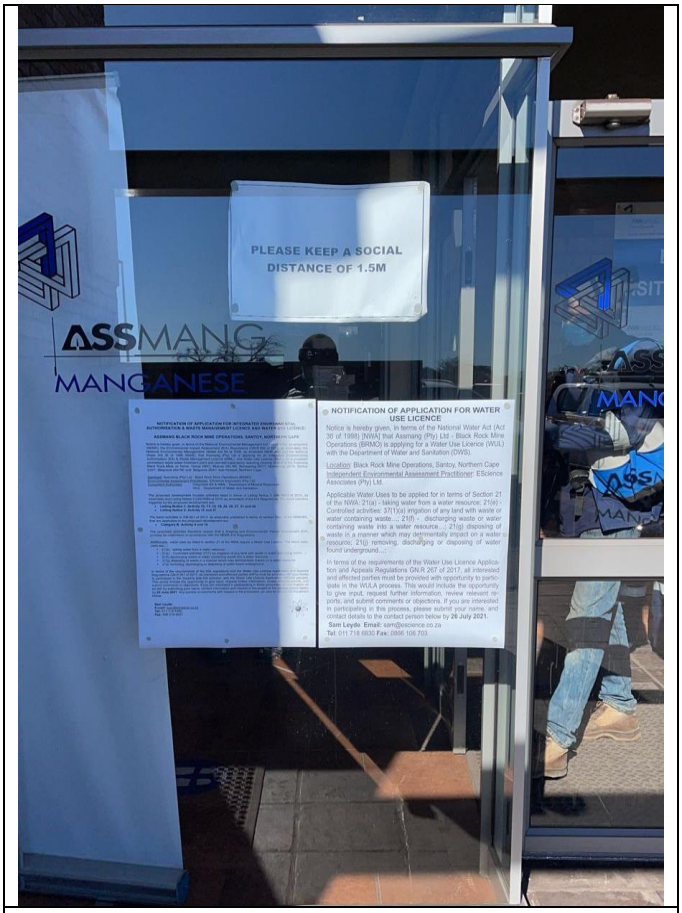


Figure 0-1: Site notice placed at BRMO main entrance

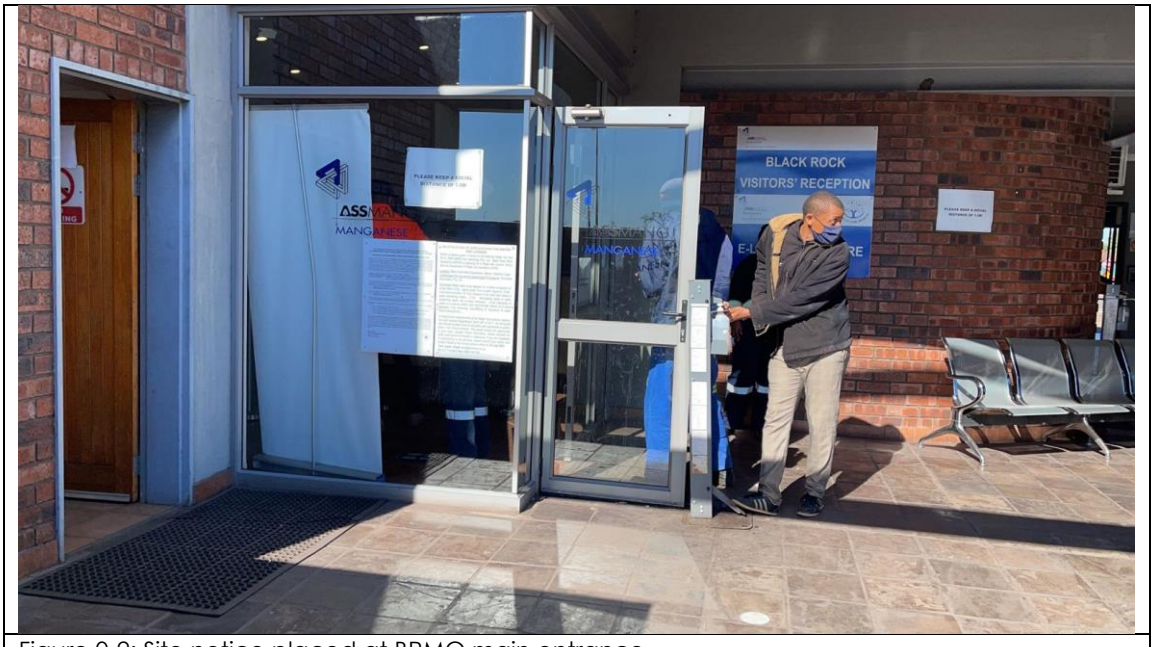


Figure 0-2: Site notice placed at BRMO main entrance

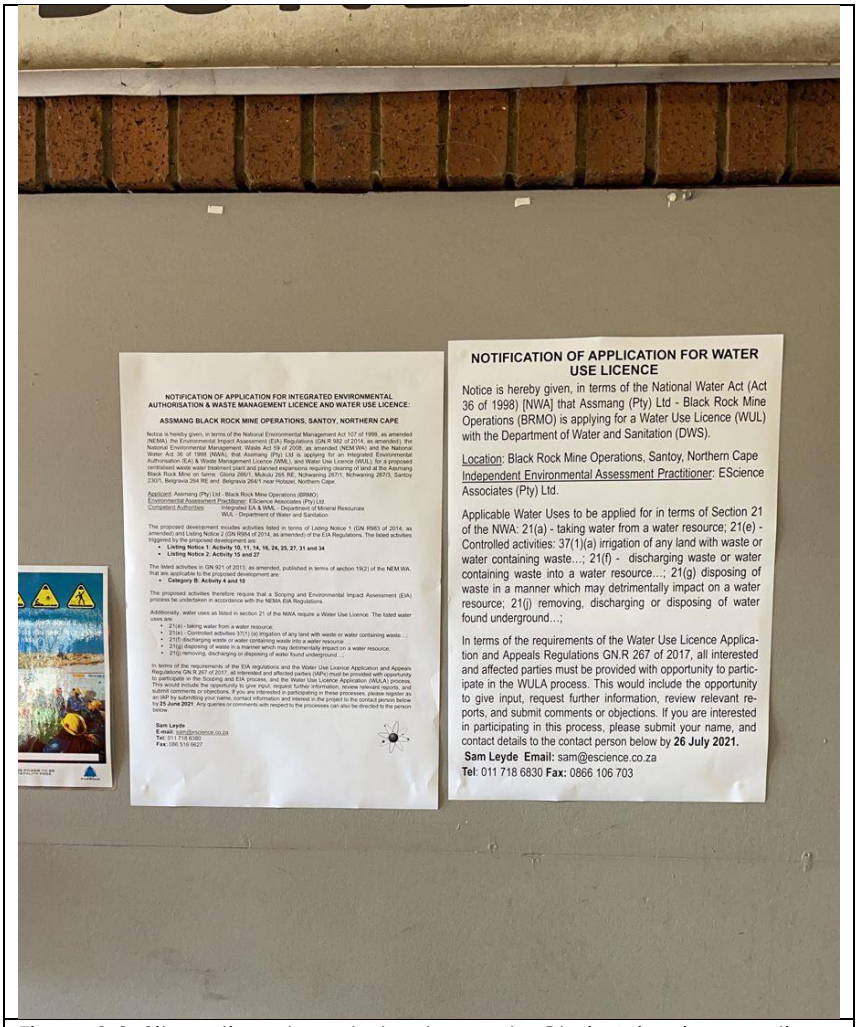


Figure 0-3: Site notice placed at entrance to Gloria Mine (zoomed)

Figure 0-4: Site notice placed at entrance to Gloria Mine

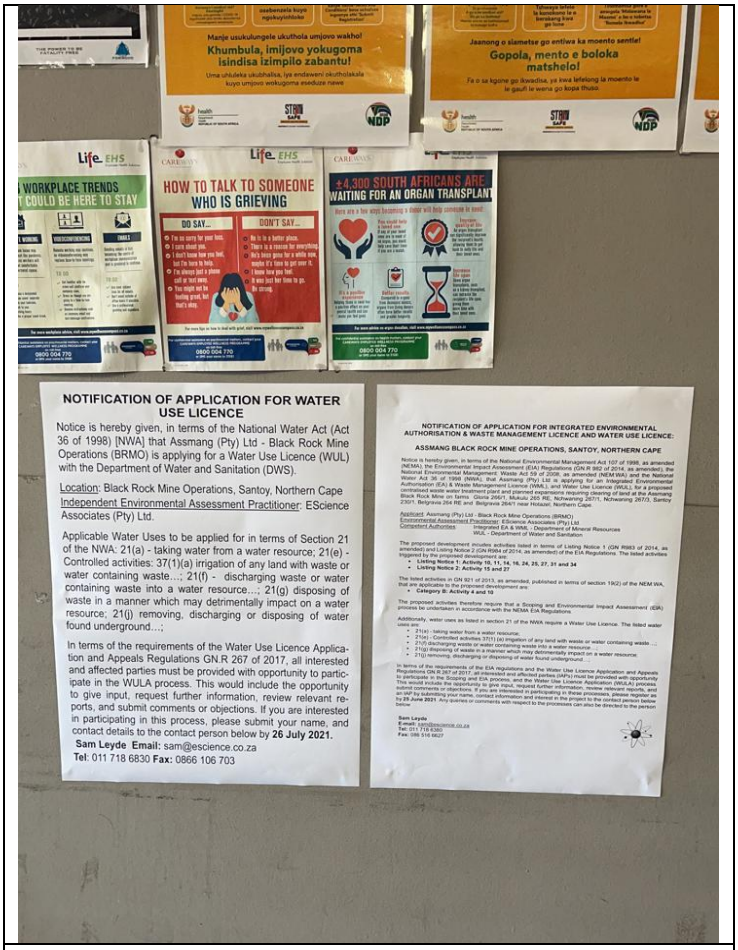
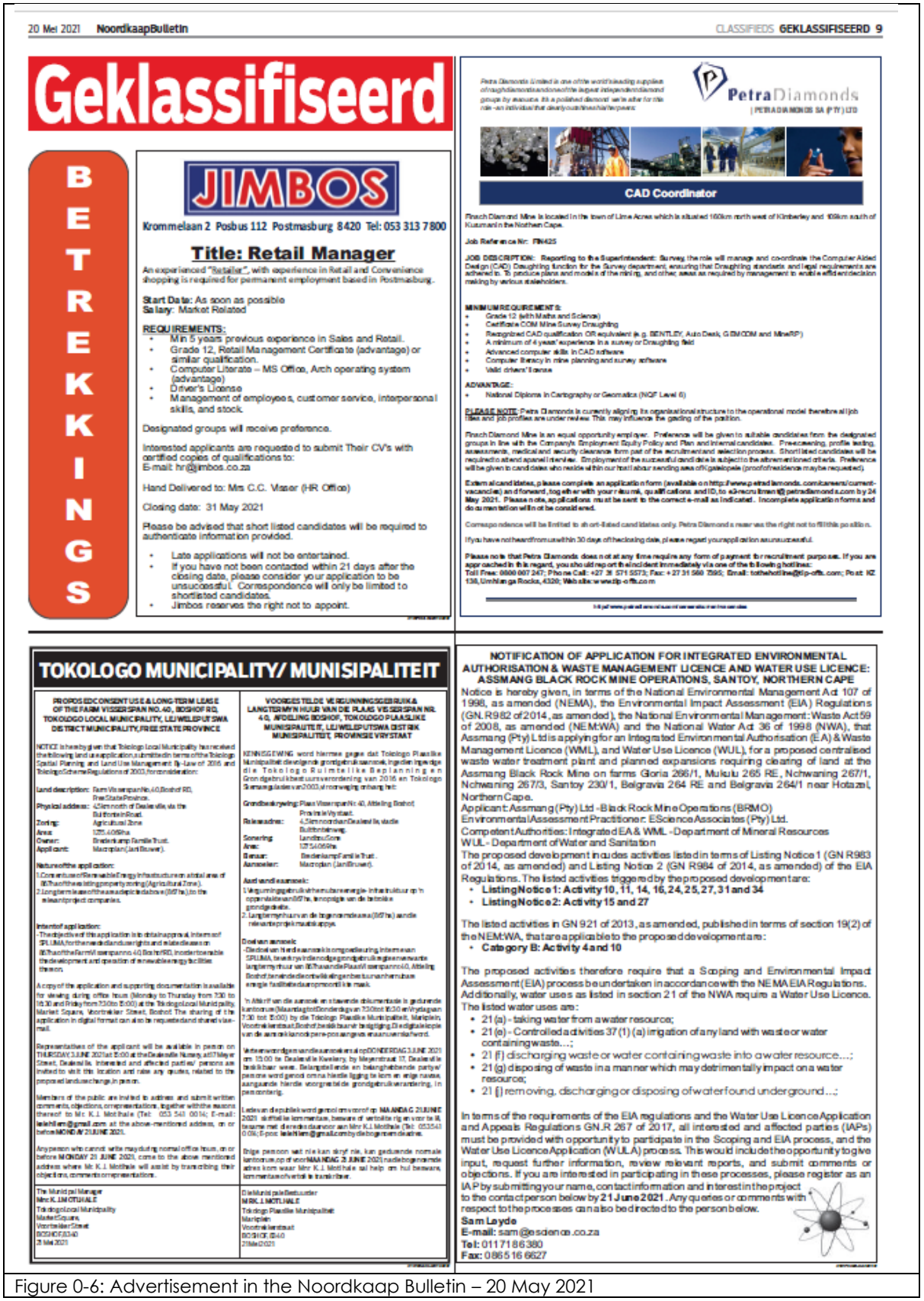


Figure 0-5: Site notice placed at entrance to Nchwaning II (zoomed)

APPENDIX 2.2: NEWSPAPER ADVERTISEMENTS



20 Mei 2021 NoordkaapBulletin CLASSIFIEDS GEKLASSIFISEERD 9

Geklassifiseerd

BETREKKINGS

JIMBOS

Krommelaan 2 Posbus 112 Postmasburg 8420 Tel: 053 313 7800

Title: Retail Manager

An experienced "Retailer", with experience in Retail and Convenience shopping is required for permanent employment based in Postmasburg.

Start Date: As soon as possible
Salary: Market Related

REQUIREMENTS:
- Min 5 years previous experience in Sales and Retail.
- Grade 12, Retail Management Certificate (advantage) or similar qualification.
- Computer Literate – MS Office, Arch operating system (advantage)
- Driver's License
- Management of employees, customer service, interpersonal skills, and stock.

Designated groups will receive preference.

Interested applicants are requested to submit Their CV's with certified copies of qualifications to:
E-mail: hr@jimbos.co.za

Hand Delivered to: Mrs C.C. Visser (HR Office)

Closing date: 31 May 2021

Please be advised that short listed candidates will be required to authenticate information provided.

- Late applications will not be entertained.
- If you have not been contacted within 21 days after the closing date, please consider your application to be unsuccessful. Correspondence will only be limited to shortlisted candidates.
- Jimbos reserves the right not to appoint.

PetraDiamonds
(PETRA DIAMONDS SA (PTY) LTD

Petra Diamonds Limited is one of the world's leading suppliers of rough diamonds and one of the largest independent diamond groups by revenue. It's a polished diamond we're after for this role - an individual that clearly outshines his/her peers!

CAD Coordinator

Finsch Diamond Mine is located in the town of Lime Acres which is situated 160km north west of Kimberley and 109km south of Kuruman in the Northern Cape.

Job Reference Nr: FIN425

JOB DESCRIPTION: Reporting to the Superintendent: Survey, the role will manage and co-ordinate the Computer Aided Design (CAD) Draughting function for the Survey department, ensuring that Draughting standards and legal requirements are adhered to. To produce plans and models of the mining, and other areas as required by management to enable effective decision making by various stakeholders.

MINIMUM REQUIREMENTS:
- Grade 12 (with Maths and Science)
- Certificate COM Mine Survey Draughting
- Recognized CAD qualification OR equivalent (e.g. BENTLEY, Auto Desk, GEMCOM and MineRP)
- A minimum of 4 years' experience in a survey or Draughting field
- Advanced computer skills in CAD software
- Computer literacy in mine planning and survey software
- Valid drivers' license

ADVANTAGE:
- National Diploma in Cartography or Geomatics (NQF Level 6)

PLEASE NOTE: Petra Diamonds is currently aligning its organizational structure to the operational model therefore all job titles and job profiles are under review. This may influence the grading of the position.

Finsch Diamond Mine is an equal opportunity employer. Preference will be given to suitable candidates from the designated groups in line with the Company's Employment Equity Policy and Plan and Internal candidates. Pre-screening, profile testing, assessments, medical and security clearance form part of the recruitment and selection process. Short listed candidates will be required to attend a panel interview. Employment of the successful candidate is subject to the aforementioned criteria. Preference will be given to candidates who reside within our host labour sending area of Galeshewe (proof of residence may be requested).

External candidates, please complete an application form (available on http://www.petradiamonds.com/careers/current-vacancies) and forward, together with your resumé, qualifications and ID, to «finschrecruitment@petradiamonds.com» by 24 May 2021. Please note, applications must be sent to the correct e-mail as indicated. Incomplete application forms and documentation will not be considered.

Correspondence will be limited to short-listed candidates only. Petra Diamonds reserves the right not to fill this position.

If you have not heard from us within 30 days of the closing date, please regard your application as unsuccessful.

Please note that Petra Diamonds does not at any time require any form of payment for recruitment purposes. If you are approached in this regard, you should report the incident immediately via one of the following hotlines:
Toll Free: 0800 007 247; Phone Call: +27 (0) 53 571 5573; Fax: +27 (0) 53 571 5560; Email: tollfreehotline@tip-offs.com; Postal: KZ 138, Umhlanga Rocks, 4320; Website: www.tip-offs.com

TOKOLOGO MUNICIPALITY/ MUNISIPALITEIT

PROPOSED CONSENT USE & LONG-TERM LEASE OF THE FARM VISSERSPAN NO. 40, BOSHOF RD, TOKOLOGO LOCAL MUNICIPALITY, LEJWELEPUTSWA DISTRICT MUNICIPALITY, FREE STATE PROVINCE

NOTICE is hereby given that Tokologo Local Municipality has received the following land use application submitted in terms of the Tokologo Spatial Planning and Land Use Management By-Law of 2016 and Tokologo Scheme Regulations of 2003, for consideration:

Land description:	Farm Visserspan No. 40, Boshof RD, Free State Province.
Physical address:	4.5km north of Dealesville, via the Bultfontein Road.
Zoning:	Agricultural Zone
Area:	1285.4068ha
Owner:	Bredenkamp Familie Trust.
Applicant:	Macroplan (Jan Bruwer).

Nature of the application:
1. Consent use of Renewable Energy Infrastructure on a total area of 80ha of the above listing property zoning (Agricultural Zone).
2. Long term lease of the area applicable above (80 ha), to the relevant project companies.

Intent of application:
- The objective of this application is to obtain approval, in terms of SPLUMA, for the needed land use rights and related lease area on 80 ha of the Farm Visserspan no. 40, Boshof RD, in order to enable the development and operation of renewable energy facilities thereon.

A copy of the application and supporting documentation is available for viewing during office hours (Monday to Thursday from 7:30 to 16:30 and Friday from 7:30 to 13:00) at the Tokologo Local Municipality, Market Square, Voortrekker Street, Boshof. The sharing of the application in digital format can also be requested and shared via e-mail.

Representatives of the applicant will be available in person on THURSDAY 3 JUNE 2021 at 15:00 at the Dealesville Nursery, 457 Meyer Street, Dealesville. Interested and affected parties/ persons are invited to visit this location and raise any queries, related to the proposed land use change, in person.

Members of the public are invited to address and submit written comments, objections, or representations, together with the reasons thereof to Mr. K.J. Motlhale (Tel: 053 540 0016; E-mail: **kelehilem@gmail.com** at the above-mentioned address, on or before **MONDAY 21 JUNE 2021.**

Any person who cannot write may during normal office hours, on or before **MONDAY 21 JUNE 2021**, come to the above mentioned address where Mr. K.J. Motlhale will assist by transcribing their objections, comments or representations.

The Municipal Manager
Mnr. K. LIKOTSHALE
Tokologo Local Municipality
Market Square,
Voortrekker Street
BOSHOF, 8340
21 Mei 2021

VOORGESTELDE VERGUNNINGSGEBRUIK & LANGTERMYN HUUR VAN DIE PLAAS VISSERSPAN NR. 40, AFDELING BOSHOF, TOKOLOGO PLAASLIKE MUNISIPALITEIT, LEJWELEPUTSWA DISTRIK MUNISIPALITEIT, PROVINSIE VRYSTAAT

KENNISGEWING word hiermee gegee dat Tokologo Plaaslike Munisipaliteit die volgende grondgebruiksaansoek, ingedien ingevolge die Tokologo Ruimtelike Beplanning en Grondgebruikbestuursverordening van 2016 en Tokologo Skemaregulasies van 2003, ter oorweging ontvang het:

Grondbeskrywing:	Plaas Visserspan Nr. 40, Afdeling Boshof, Provinsie Vrystaat.
Reliesadres:	4,5km noordoos Dealesville, vanaf Bultfontein weg.
Sonering:	Landbou Sone
Area:	1285.4068ha
Eienaar:	Bredenkamp Familie Trust.
Aansoeker:	Macroplan (Jan Bruwer).

Aard van die aansoek:
1. Vergunningsgebruik vir hernubare energie- infrastruktuur op 'n oppervlakte van 80 ha, binnegelig van die betrokke grondgebied se.
2. Langtermyn huur van die bogenoemde area (80 ha) aan die relevante projek maatskappye.

Doel van aansoek:
- Doelwit van hierdie aansoek is om goedkeuring, ingevolge van SPLUMA, te verkry vir die nodige grondgebruik regte en verwante langtermyn huur van 80 ha van die Plaas Visserspan no. 40, Afdeling Boshof, ten einde die ontwikkeling en bedryf van hernubare energie fasiliteite daarop moontlik te maak.

'n Afskrif van die aansoek en ondersteunende dokumentasie is gedurende kantoorure (Maandag tot Donderdag van 7:30 tot 16:30 en Vrydag van 7:30 tot 13:00) by die Tokologo Plaaslike Munisipaliteit, Marktplein, Voortrekkerstraat, Boshof, beskikbaar vir besigtiging. Die digitale kopie van die aansoek kan ook per e-pos aangevra en aan u verskaf word.

Verteenwoordigers van die aansoek sal era op DONDERDAG 3 JUNIE 2021 om 15:00 te Dealesville Kwekery, by Meyerstraat 17, Dealesville beskikbaar wees. Belangstellende en belanghebbende partye/ persone word gerig om na hierdie ligging te kom en enige navrae, aangaande hierdie voorgestelde grondgebruikverandering, in persoon te rig.

Lede van die publiek word gerig om vervolg op **MAANDAG 21 JUNIE 2021** skriftelike kommentare, besware of vertoë te rig en voor te lê, tesame met die redes daarvoor aan Mnr K.J. Motlhale (Tel: 053 540 0016; E-pos: **kelehilem@gmail.com** by die bogenoemde adres.

Enige persoon wat nie kan skryf nie, kan gedurende normale kantoorure op of voor **MAANDAG 21 JUNIE 2021** na die bogenoemde adres kom waar Mnr K.J. Motlhale sal help om hul besware, kommentare of vertoë in te skryf.

Die Munisipale Bestuurder
MNR. J. MOTLHALE
Tokologo Plaaslike Munisipaliteit
Marktplein
Voortrekkerstraat
BOSHOF, 8340
21 Mei 2021

NOTIFICATION OF APPLICATION FOR INTEGRATED ENVIRONMENTAL AUTHORISATION & WASTE MANAGEMENT LICENCE AND WATER USE LICENCE: ASSMANG BLACK ROCK MINE OPERATIONS, SANTOY, NORTHERN CAPE

Notice is hereby given, in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA), the Environmental Impact Assessment (EIA) Regulations (GN. R982 of 2014, as amended), the National Environmental Management: Waste Act 59 of 2008, as amended (NEM:WA) and the National Water Act 36 of 1998 (NWA), that Assmang (Pty) Ltd is applying for an Integrated Environmental Authorisation (EA) & Waste Management Licence (WML), and Water Use Licence (WUL), for a proposed centralised waste water treatment plant and planned expansions requiring clearing of land at the Assmang Black Rock Mine on farms Gloria 266/1, Mukulu 265 RE, Nchwaning 267/1, Nchwaning 267/3, Santoy 230/1, Belgravia 264 RE and Belgravia 264/1 near Hotazel, Northern Cape.

Applicant: Assmang (Pty) Ltd - Black Rock Mine Operations (BRMO)
Environmental Assessment Practitioner: EScience Associates (Pty) Ltd.
Competent Authorities: Integrated EA & WML - Department of Mineral Resources
WUL - Department of Water and Sanitation

The proposed development includes activities listed in terms of Listing Notice 1 (GN R983 of 2014, as amended) and Listing Notice 2 (GN R984 of 2014, as amended) of the EIA Regulations. The listed activities triggered by the proposed development are:
- **Listing Notice 1: Activity 10, 11, 14, 16, 24, 25, 27, 31 and 34**
- **Listing Notice 2: Activity 15 and 27**

The listed activities in GN 921 of 2013, as amended, published in terms of section 19(2) of the NEM:WA, that are applicable to the proposed development are:
- **Category B: Activity 4 and 10**

The proposed activities therefore require that a Scoping and Environmental Impact Assessment (EIA) process be undertaken in accordance with the NEMA EIA Regulations. Additionally, water uses as listed in section 21 of the NWA require a Water Use Licence. The listed water uses are:
- 21 (a) - taking water from a water resource;
- 21 (e) - Controlled activities 37 (1) (a) irrigation of any land with waste or water containing waste…;
- 21 (f) discharging waste or water containing waste into a water resource…;
- 21 (g) disposing of waste in a manner which may detrimentally impact on a water resource;
- 21 (j) removing, discharging or disposing of water found underground…;

In terms of the requirements of the EIA regulations and the Water Use Licence Application and Appeals Regulations GN.R 267 of 2017, all interested and affected parties (IAPs) must be provided with opportunity to participate in the Scoping and EIA process, and the Water Use Licence Application (WULA) process. This would include the opportunity to give input, request further information, review relevant reports, and submit comments or objections. If you are interested in participating in these processes, please register as an IAP by submitting your name, contact information and interest in the project to the contact person below by **21 June 2021**. Any queries or comments with respect to the processes can also be directed to the person below.

Sam Layde
E-mail: sam@escience.co.za
Tel: 011 718 6380
Fax: 086 516 6627

Figure 0-6: Advertisement in the Noordkaap Bulletin – 20 May 2021

10 29 Mei / May / Motsheganong 2021 • KATHU GAZETTE

NOTIFICATION OF APPLICATION FOR INTEGRATED ENVIRONMENTAL AUTHORISATION & WASTE MANAGEMENT LICENCE AND WATER USE LICENCE: ASSMANG BLACK ROCK MINE OPERATIONS, SANTOY, NORTHERN CAPE

Notice is hereby given, in terms of the National Environmental Management Act 107 of 1998, as amended (NEMA), the Environmental Impact Assessment (EIA) Regulations (GN R 982 of 2014, as amended), the National Environmental Management: Waste Act 59 of 2008, as amended (NEM:WA) and the National Water Act 36 of 1998 (NWA), that Assmang (Pty) Ltd is applying for an Integrated Environmental Authorisation (EA) & Waste Management Licence (WML), and Water Use Licence (WUL) for a proposed centralised wastewater treatment plant and planned expansions requiring clearing of land at the Assmang Black Rock Mine on farms Gloria 266/1, Mukulu 265 RE, Nchwaning 267/1, Nchwaning 267/3, Santoy 230/1, Belgravia 264 RE and Belgravia 264/1 near Hotazel, Northern Cape.

Applicant: Assmang (Pty) Ltd - Black Rock Mine Operations (BRMO)
Environmental Assessment Practitioner: EScience Associates (Pty) Ltd.
Competent Authorities: Integrated EA & WML - Department of Mineral Resources
WUL - Department of Water and Sanitation

The proposed development includes activities listed in terms of Listing Notice 1 (GN R983 of 2014, as amended) and Listing Notice 2 (GN R984 of 2014, as amended) of the EIA Regulations. The listed activities triggered by the proposed development are:
- Listing Notice 1: Activity 10, 11, 14, 19, 24, 25, 27, 31 and 34
- Listing Notice 2: Activity 15 and 27

The listed activities in GN 921 of 2013, as amended, published in terms of section 19(2) of the NEM:WA, that are applicable to the proposed development are:
- Category B: Activity 4 and 10

The proposed activities therefore require that a Scoping and Environmental Impact Assessment (EIA) process be undertaken in accordance with the NEMA EIA Regulations.

Additionally, water uses as listed in section 21 of the NWA requires Water Use Licence. The listed water uses are:
- 21(a) - taking water from a water resource;
- 21(e) - Controlled activities 37(1)(a) irrigation of any land with waste or water containing waste...;
- 21(f) discharging waste or water containing waste into a water resource...;
- 21(g) disposing of waste in a manner which may detrimentally impact on a water resource;
- 21(j) removing, discharging or disposing of water found underground...;

In terms of the requirements of the EIA regulations and the Water Use Licence Application and Appeals Regulations GNR 267 of 2017, all interested and affected parties (IAPs) must be provided with opportunity to participate in the Scoping and EIA process, and the Water Use Licence Application (WULA) process. This would include the opportunity to give input, request further information, review relevant reports, and submit comments or objections. If you are interested in participating in these processes, please register as an IAP by submitting your name, contact information and interest in the project to the contact person below by 28 June 2021. Any queries or comments with respect to the processes can also be directed to the person below:

Sam Leyde
E-mail: sam@escience.co.za
Tel: 011 718 6380
Fax: 086 516 6827

DITLHARAPENG

NPO empowers 20 unemployed women

Unemployed women in Ditlharapeng village who participated in the free one-day business and cake baking training.

Beyond Horizons Enterprise Development, a local non-profit organisation, registered under the Department of Social Development, in partnership with cake baking business, Omolemo Cake Delights, conducted a free one-day business and cake baking training for twenty unemployed women in Ditlharapeng village, located in the remotest rural area of the Joe Morolong municipality, on Saturday 08 May 2021.

Twenty unemployed women between the ages of 23 and 40 were given a glimpse of hope when they were taken through the processes of starting, growing, and managing a cake-baking business.

The team from Omolemo Cake Delights, which bakes cakes ranging from romantic, weddings, baby showers, birthdays, and corporate to themed cakes, taught the women different forms of cakes and muffins. They learned how to mix, bake and decorate the cakes using both fondant and cream.

The Director of Omolemo Cake Delights, Ms Kebitsaone Bopape, said that "it was heart-warming to see the hunger for wanting to learn from the participants. Most of the women wanted to experiment with different decorations and characters and surprisingly, most of their designs came out brilliant.

"It taught me something about women continuing to be a reservoir of talent - irrespective of their environment. They only need to be resourced, and if supported, the scourge of poverty would ultimately be defeated in the country," said Mrs Bopape.

Mrs Bopape further appealed to the government to work with organisations such as Beyond Horizons Enterprise Development, which was established as a response to an alarming rate of unemployment within communities - especially vulnerable women and youth in the rural areas where there are limited resources.

Issuing out certificates to the elated twenty women, the Treasurer of Beyond Horizons Enterprise Development, Ms Dinah Sewadi, encouraged the women to focus and start baking businesses to create jobs and to fight unemployment.

The Chairperson of Beyond Horizons Enterprise Development, Mr Itumeleng Tshipageebonwe, said that his organisation is 70% rural-focused, especially amongst high poverty nodes, to empower unemployed women and youth to start job-creating initiatives. "However, our limitation is lack of resources to fulfil the mandate of fighting against the high rate of unemployment and poverty. We wish if the government and corporate sector could come on board together to overcome the enemy of poverty and unemployment," concluded Mr Tshipageebonwe.

JTG DISTRICT

Gospel a cappella group releases new album

Inkozo ya mawesile

The gospel a cappella group Inkozo Ya Mawesile.

Inkozo Ya Mawesile has just released their new album titled Ikagele Areka.

They appeal to the JTG District in the Northern Cape at large for their support as they always do by buying their music.

They are available for stages and other events. The new album is based on real-life of today because of the floods and Corona pandemic all over the world. They pass a message to the people by singing. That is why they named their album Ikagele Areka. It means build yourself an ark for you to be safe under the ark.

The group consists of 26 members and they accept anything you give them. They have to look smart and to get that, they need financial muscles. They travel all over the continent to spread the gospel of the Lord.

For more info do not hesitate to contact their PRO Mr Tuelo Matsipane 072 219 2104

Figure 0-7: Advertisement in the Kalahari Gazette – 28 May 2021

APPENDIX 2.3: INTERESTED AND AFFECTED PARTIES LIST

Table 0-1: List of interested and affected parties		
First Name/s or Initial/s	**Surname**	**Organisation**
Commenting Authorities		
Sebusho	Sipho	John Taolo Gaetsewe District Municipality (Municipal Manager)
Gaborone	Eric	Ga-Segonyana Local Municipality (Municipal Manager)
Tshepo	Bloom	Joe Morolong Local Municipality (Municipal Manager)
Sylvia	Moholo	Department of Public Works
Sunday	Mabaso	Department of Mineral Resources (Regional Head: Environment)
Abader	Ishaam	Deputy-Director General: Legal, Authorisations, Compliance & Enforcement, Department of Environmental Affairs
K.I.	Jonathan-Makhoiole	John Taolo Gaetsewe District Municipality
Sibongile	Lekiso	John Taolo Gaetsewe District Municipality
J	Swartt	John Taolo Gaetsewe District Municipality
J	Russouw	John Taolo Gaetsewe District Municipality
Nozie	Mazwie	Water Affairs: Lower Vaal
Neo	Leburu	Department of Water and Sanitation
Dineo	Kgosi	NCDENC: Waste Management
L.P	Segapo	John Taolo Gaetsewe District Municipality
Phabelo	Simpson	Joe Morolong Local Municipality
Pinky	Maape	Gasegonyana Local Municipality
	Simon	Gasegonyana Local Municipality
Lerato	Mokhoantle	Department of Water and Sanitation
Julius	Muyorautu	NCDENC: Environmental Quality
Nditsheni	Ramuhulu	NCDENC: Impact Management

Table 0-1: List of interested and affected parties		
First Name/s or Initial/s	**Surname**	**Organisation**
Jacoleen	Mans	Department of Agriculture, Forestry and Fisheries
Natasha	Higgitt	SAHRA
Gerrie	Van der Westhuizen	John Taolo Gaetsewe District Municipality
Lorraine	Nobelsa	Department of Water and Sanitation
Philani	Msimango	Department of Water and Sanitation
Markus Nhlapo	Mlwayedwa	Ward Councillor
Interested and Affected Parties		
Gert	Olivier	Kudumane Farmers Union
Charlmarie	Peche-Kroeze	Barrange (Pty) Ltd
Danie	Pretorious	Barrange Farm
Kgosietsile	Gaonnwe	Kalagadi Manganese
Jeff	Leader	Ntsimbintle mining (Pty) Ltd
Marilette	van der Walt	Neighbouring Landowner
Teboho	Zide	Zyde Investments (Pty) Ltd.
Ruan	Buhr	Infrasors
E. R.	van Schalkwyk	Farmer - Iehating
Alan	Roberts	Kalgadi Manganese
Gawie	Stols	Farmer - Boerdraai
Bobby	Reyneke	Neighbouring Farmer (landowner of Nchwaning 257 Portion O RE
HJ	Lampbrecht	
WP	van der Walt	
JL	Reynecke	
Francios	Erasmus	
Maserame Conny(Connie)	Mashishi	

Table 0-1: List of interested and affected parties		
First Name/s or Initial/s	**Surname**	**Organisation**
Basie	Van Wyk	Mokala Manganese
Wonder	Sigwebela	South 32
Johan	Combrink	Glencore
Andre		Goodrock
Wikus	Blysma	
RG	Viljoen	
Gomolemo	Mothobi	Go Neo General Trading (Pty) Ltd

APPENDIX 2.4: PROOF OF DISTRIBUTION TO IAPS

This is the draft scoping report for distribution to IAPs. Proof of distribution will be included in the final report.

APPENDIX 2.5: COMMENTS AND RESPONSES

This is the draft scoping report for distribution to IAPs. Comments and Responses will be included in the final report.

APPENDIX 3: AUTHORITY CORRESPONDENCE

APPENDIX 3.1: DMR ACKNOWLEDGMENT OF RECEIPT OF APPLICATION FORMS

This is the draft scoping report for distribution to IAPs. Proof of submission of application and acknowledgment from DMR will be included in the final report.

APPENDIX 3.2: SUBMISSION OF DRAFT SCOPING TO COMPETENT AUTHORITY

This is the draft scoping report for distribution to IAPs. Proof of submission will be included in the final report.

APPENDIX 3.3: COMMENTS FROM COMPETENT AUTHORITY

This is the draft scoping report for distribution to IAPs. Comments and Responses will be included in the final report.