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SISHEN IRON ORE COMPANY (PTY) LTD

INFRASTRUCTURE AND ACTIVITIES ASSOCIATED WITH KOLOMELA MINE NEAR POSTMASBURG, NORTHERN CAPE

ENVIRONMENTAL IMPACT ASSESSMENT

&

ENVIRONMENTAL MANAGEMENT PROGRAMME

PART A

DRAFT FOR PUBLIC COMMENT

DMRE REFERENCE: NC 30/5/1/2/3/2/1/ (00205) MR

EXM Advisory Services

ENVIRONMENTAL • MINERAL RIGHTS • SOCIAL & SD

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ENVIRONMENTAL IMPACT ASSESSMENT

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ENVIRONMENTAL MANAGEMENT PROGRAMME

PART A

DRAFT FOR PUBLIC COMMENT

NAME OF APPLICANT: Sishen Iron Ore Company (Pty) Ltd – Kolomela Mine

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POSTAL ADDRESS: Private Bag X3003, Postmasburg, 8420

PHYSICAL ADDRESS: Kolomela Mine, Farm Strydfontein, Postmasburg

REF NUMBER: NC 30/5/1/2/3/2/1/ (00205) MR

SUBMITTED FOR AUTHORISATION IN TERMS OF:

LISTED ACTIVITIES UNDER THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT

PREPARED BY: EXM Environmental Advisory (Pty) Ltd

Date: 12 November 2021

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Report Sign-Off			
Name	**Designation**	**Signature**	**Date**
Trevor Hallatt	EXM Environmental Advisory (Pty) Ltd Senior Environmental Scientist (EAP)		12 November 2021
Divan van der Merwe	EXM Advisory Services (Pty) Ltd Director		12 November 2021
Kerry Fairley	EXM Advisory Services (Pty) Ltd Report Reviewer Pr.Sci.Nat.		12 November 2021

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ACRONYMS AND ABBREVIATIONS

	Definition
BID	Background Information Document
DMRE	Department of Mineral Resources and Energy
DMS	Dense Media Separation
DSO	Direct Shipping Ore
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GNR	Government Notice Regulation
HME	Heavy Mining Equipment
IAP	Interested and Affected Party
IWWMP	Integrated Water and Waste Management Plan
KS	Kapstevel
LDV	Light Driving Vehicles
LOM	Life of Mine
mamsl	Metres above mean sea level
Mt	Million Tonnes
MPRDA	Mineral and Petroleum Resources Development Act
MW	Megawatt
NDCR	National Dust Control Regulations
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management Air Quality Act
NEM: BA	National Environmental Management Biodiversity Act
NEM: WA	National Environmental Management Waste Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NIA	Noise Impact Assessment
PM	Particulate Matter
PV	Photovoltaic
ROM	Run of Mine
SIOC	Sishen Iron Ore Company
SACNASP	South African Council for Natural & Scientific Professionals
SAHRA	South African Heritage Resource Agency
SANS	South African National Standards
SIOC	Sishen Iron Ore Company (Pty) Ltd
SLP	Social Labour Plan
TOPS	Threatened or Protected Species
TSF	Tailings Storage Facility
WRD	Waste Rock Dump
WUL	Water Use Licence

1. EXECUTIVE SUMMARY

1.1 Project overview

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south west of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province. The Minister of Mineral Resources granted a mining right for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR} and is valid until 17 September 2038, unless cancelled or suspended.

Kolomela mine operates as a conventional open cast mine where ore is extracted by means of drilling, blasting, loading and hauling. Ore extracted from the pits is transported to a direct shipping ore (DSO) plant which involves the crushing and screening of recovered ore material into stockpiles of 'lump' and 'fines'. The processed iron ore is loaded onto an internal railway line which is connected to a direct rail link to Transnet's Sishen-Saldanha railway line from where the iron ore is transported to the Port of Saldanha for export. Kolomela Mine also utilises a Modular Dense Media Separation (DMS) Processing Plant for the processing of low grade ore not suitable for processing at the DSO plant. Kolomela produced 10.8 million tonnes during its first full year of production in 2013 and currently produces 13-14 million tonnes per annum (Mtpa) facilitated by enhanced stripping techniques and processing of 1-3 Mtpa of lower grade of ore at the Tierbult DMS Modular Plant.

Iron ore is currently extracted from three opencast pits, namely Klipbankfontein, Leeuwfontein and Kapstevel North. Kolomela is in the process of developing the Kapstevel South Pit which is required to sustain the mining production at approximately 14 Mtpa (Mtpa) until 2034, but with the potential to be extended in future with the development of the Ploegfontein, Tierbult and Heuningkranz ore bodies, the mining of which are already authorised.

Kolomela proposes to expand and amend some of the existing activities and also develop new infrastructure to support continued and future production at the mine. This includes:

- Amendment of the Kapstevel South Pit footprint area.
- Amendment of the Kapstevel Waste Rock Dumps and haul roads.
- Amendment of Kapstevel Evaporation Ponds and stormwater management infrastructure.
- Additional park-up, laydown and ore stockpile areas.
- Development of new DMS tailings management infrastructure
- A new Photovoltaic Solar Facility.
- A new Waste Tyre Management Facility.
- A conveyor and railway line to transfer material to and from the DMS plant.
- Amendment to the future Kapstevel DMS conveyor footprint to facilitate widened haul roads.

- Amendment of Kapstevel Waste Rock Dumps and Additional Waste Rock Dumps.
- Additional Low Grade Ore Storage Areas.
- Infrastructure associated with autonomous haulage
- New radio masts and LTD towers.
- Provision for an area of relaxation and safety berms around pits.

The existing and planned infrastructure at Kolomela mine are show in (Figure 4-1, 4-2 and 4-3).

Authorisation is thus being sought from the Department of Mineral Resources & Energy (DMRE) for activities listed under the National Environmental Management Act (No. 107 of 1998) and the National Environmental Management: Waste Act (No. 59 of 2008) as well as amendment of the environmental management programme in terms of Section 102 of the Minerals & Petroleum Resources Development Act (No. 28 of 2002). The authorisation will cover existing and proposed footprints. This is supported by a Scoping Study and an Environmental Impact Assessment (EIA).

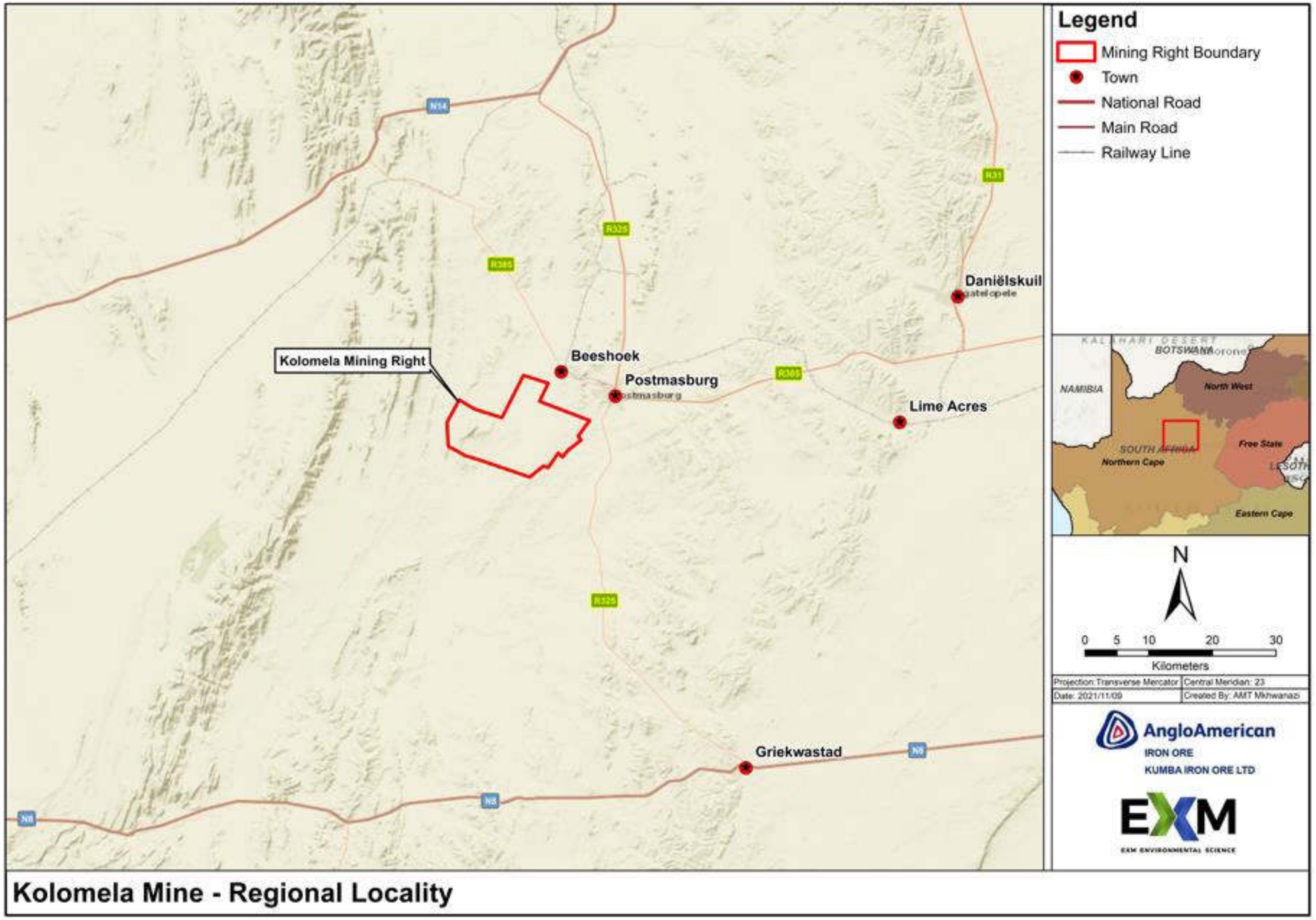


FIGURE 1-1: LOCALITY MAP – KOLOMELA MINE

1.2 Environmental Authorisations

1.2.1 Environmental Impact Assessment Process

The expansion of mining related activities at Kolomela mine triggers various activities listed in Listing Notices 1 (GN R. 324 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 327 of 2017) published in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA). The expansion activities also trigger activities listed in Category B of GNR 921 (Waste Management Activities) published in terms of the National Environmental Management Waste Act (No. 59 of 2008). Therefore, a full Environmental Impact Assessment and Scoping process must be undertaken in terms of the EIA regulations (GNR 326 of 2017) to obtain Environmental Authorisation (EA) for the proposed expansion activities. The Northern Cape Department of Mineral Resources and Energy (DMRE) is the Competent Authority (CA) for the EIA process.

EXM Environmental Advisory (Pty) Ltd ("EXM") has been appointed as the independent Environmental Assessment Practitioner (EAP) to facilitate the EIA as well as the supporting public consultation process. This scoping report has been developed according to the requirements of the EIA regulations to verify and assess the scope of work that will be undertaken during the impact assessment phase.

1.2.2 Water Use Licence Application

A separate Integrated Water Use Licence will be undertaken for the following activities listed in Section 21 of the National Water Act (Act No. 36 of 1998).

TABLE 1-1: NWA SECTION 21 LISTED ACTIVITIES

The application for the water use licence will be take place concurrent to the EIA process.

National Water Act Section 21 listed activities	Activities and infrastructure
Section 21 c&i	Crossing of watercourses (episodic drainage lines)
	Impacts on wetland pans or their catchment for the development of new infrastructure or amendment of existing infrastructure.
	Development of infrastructure within floodlines
Section 21 g	Disposal of waste rock material at new Waste Rock Dumps at Kapstevel;
	Storage of tailing at new paddocks at the DMS plant;

National Water Act Section 21 listed activities	Activities and infrastructure
	Disposal of tailing at a new Tailing Storage Facility (TSF);
	Development of a new return water dam for the TSF

1.3 Public participation

A public participation process (PPP) is conducted in terms of the Chapter 6 of NEMA and the EIA regulations. A consolidated PPP was undertaken in support of the EIA and WUL applications. The purpose of the public participation process is to inform all the identified Interested and Affected Parties (IAPs) of the proposed development and associated application processes and allow them to raise comments/concerns. The scoping phase of the EIA has been completed and the final Scoping report has been accepted by the DMRE. Comments received during the scoping phase have been incorporated into the draft Environmental Impact Assessment Report (EIR). The draft EIR (this document) is available to all IAPs for a period of 30 day for comment.

1.4 Specialist studies

The following specialist studies have been undertaken in support of the EIA and EMP development and included in Part C.

TABLE 1-2: SPECIALIST STUDIES

Specialist study	Annexure (Part C)
Air Quality Impact Assessment	Annexure A
Noise Impact Assessment	Annexure B
Floral Assessment	Annexure C
Faunal Assessment	Annexure D
Freshwater Aquatic Assessment	Annexure E
Heritage Impact Assessment	Annexure F1
Palaeontological Assessment	Annexure F2
Hydropedological Assessment	Annexure G
Visual Impact Assessment	Annexure H
Geohydrological Assessment	Annexure I
Avifaunal Assessment	Annexure J
Aviation Sensitivity Study	Annexure K
Waste Assessment Report	Annexure L
Hydrology, Stormwater Management Plan and Water	Annexure M

Specialist study	Annexure (Part C)
Balance	
Summary of Biodiversity Studies	Annexure N
Closure Plan	Annexure O

1.5 Environmental Impacts

A summary of the key environmental impacts associated with the project are provided in Table 1-2 and a summary of the impacts are provided in the subsequent section. The table shows the significance rating of the impacts without the implementation of mitigation measures. The implementation of mitigation measures will lower the significance of the impacts as indicated in the table.

The impact assessment focussed on the new (amended) as well as the existing infrastructure and activities associated with Kolomela. The impacts were assessed from a cumulative perspectives, existing as well as future impacts which takes into account Kolomela as a whole and included all activities.

TABLE 1-3: SUMMARY OF KEY POSITIVE AND NEGATIVE IMPACTS IDENTIFIED

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
Biodiversity - Flora	Vegetation clearance Ploegfontein and Tierbult Pits Leeuwfontein North Kapstevel Klipbankfontein WRDS	Impact on floral Habitat and Diversity Impact on floral Species of Conservation Concern (SCC)	High	• Procedure for the Removal of Topsoil, including Vegetation. • Contractor/employee or section responsible for topsoil removal. must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle and people to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Unimpacted wetland pans must be dedicated no go areas.	Moderate
Biodiversity - Fauna	Vegetation clearance Kapstevel WRD in Mountain Bushveld Habitat Unit	Impact on floral Habitat and Diversity Impact on floral Species of Conservation Concern (SCC)	High	• Strict speed limits to prevent animal strikes. • Culverts should be installed (where practicable and if possible) along any drainage lines under roads and fences to allow for the movement of smaller species (particularly small mammals and reptiles). • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site. • The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	Moderate
Avifaunal (birds)	Development of PV solar facility	Impact on avifaunal Habitat and Diversity Impact on avifaunal SCC	Moderate	• The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint; • Any structures which may act as perching sites for birds should be installed with anti-perching spikes; • Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the study area and may increase avian collisions or electrocutions; • Avifaunal habitat beyond the demarcated area should not be cleared or altered • No collection of any avifaunal may be allowed by construction personnel; • No illicit / uncontrolled fires must be allowed during the construction phase of the proposed development.	Low
Soil	Removal of topsoil during all developments	Loss of soil and land capability	Moderate	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Topsoil management procedure. • Angle of repose to be used for stockpile development and disturbance of stockpiles must be limited to preserve the soil integrity. • Topsoil stockpiles that will be stored for < 2 years may not exceed 2 meters and older stockpiles can exceed 2 meters, however no equipment will be allowed on top of stockpiles for any reason including deposition of soil. • Topsoil stockpiles must be separated from areas with the potential to cause pollution, i.e. use berms to separate areas. • Any contaminated soil must be excavated, placed in a designated, labelled skip and taken to the bioremediation facility for treatment. The treated soil can be used for rehabilitation purposes, after quality monitoring has been conducted.	Low
Surface water – Wetland Pans	Ploegfontein and Tierbult Pits Leeuwfontein North Klipbankfontein Construction of haul roads	Total or partial loss of wetland pans and or the associated catchments. Disturbance of episodic drainage lines.	High	• Implement mitigated layout plan to avoid wetland pans as far as possible. • Implement stormwater control measures close to water courses. • Restrict movement outside demarcated areas, especially close to water courses. • Biomonitoring in episodic drainage lines.	Moderate
Groundwater	Dewatering of aquifer	Potential impact on aquifer yield	High	• Continue with groundwater monitoring (levels) • Continue monitoring of dewatering volumes. • Engage with stakeholders at the Kolomela Environmental Forum. • Update groundwater model every two years. • Continue with aquifer recharge.	Moderate
Air quality	Blasting Haul trucks traveling on roads Exposed surfaces	Increased dust fall and PM emissions.	Moderate	• Strict speed limits on all roads. • Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent on permanent haul roads and water suppression on other roads.	Low

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
	DSO Plant	Nuisance conditions		Investigate the use of a product that is biodegradable and water efficient as far as possible. • Dust suppression on exposed areas during construction activities. • Controlled blasting according to a blasting procedure. Only use registered contractors with appropriate training for blasting. • Dust fall monitoring according to the National Dust Control Regulations. • PM 10 and PM 2.5 monitoring. • Implement a community grievances and complaints management procedure. All complaints must be responded to and/or investigated. • Present monitoring results at Kolomela environmental forum. • Wet scrubber system to remove the dust from the crushing and screening processes at the DSO Processing Plant. Maintenance of scrubber system according to product specifications.	
Noise	Movement of vehicles Drilling and blasting Material handling and deposition Deposition of waste rock	Nuisance conditions for receptors in the area.	Moderate	• Strict speed limits on all Kolomela roads. • No blasting at night time as far as possible. • Communicate blasting times to relevant stakeholders in close proximity to the blasting area. Currently the family residing at the Klipbankfontein farmstead must be notified of blasts in the Sourthern portion of the Leeuwfontein pit. • Controlled blasting. Only use registered contractors with appropriate training for blasting. • Community and complaints management procedure. All complaints must be responded to and/or investigated. • Conduct summer and winter environmental noise monitoring.	Low
Heritage	Establishment of footprints	Destruction of heritage resources	Moderate	Implement actions as per Cultural Heritage Management Plan	Low
Green house gas emissions	Generation of electricity at the solar PV facility	Reduction in dependency on fossil fuel energy Decreased carbon footprint	Moderate positive	None proposed	Moderate positive
Social	Pressure on municipal services A shortage of proper and affordable housing Increase in social ills Strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine	Negative social consequences	Moderate to high	• Capacity building and support initiatives to alleviate pressure on the municipality. • Housing policy and building of additional houses (including rental stock) for employees • Planned programmes and initiatives to enhance social wellness in Tsantsabane through continued support of, and collaboration with institutions and organisations involved in combatting social ills.	Moderate
Socio-economic	Local procurement and enterprise development Local employment Catalyst for local economic development Enhancement of community skills levels Enhanced infrastructure development Improved access to, and quality of school education	Contribution to local economic development	High Positive	• Preferential procurement plan. Kumba supplier development programme. • Social and Labour Plan commitments and implementation of the mine's local recruitment policy. Collaboration with the municipality's unemployment forum. In addition: Local employment commitments from contractors and monitoring thereof. • Participation in the municipal IDP and LED Forums. Collaboration and engagement with local business organisations. In addition: Encouraging contractors and other service providers to recruit and procure locally. Collaboration with regional LED structures to enhance economic development in the Gamagara Corridor. • Promote the Kolomela Community Skills Centre in local communities. Bursary scheme. Scholarship scheme. Internship programme. Investigations to establish a technical subjects section at Postmasburg secondary school. Investigations on the establishment of an FET satellite campus in Postmasburg. In addition: Require specific skills development interventions from contractors. • SLP commitments, aligned with the municipal IDP TSASSAMBA Public Private Partnership with Beeshoek mine and Tsantsabane Local Municipality • SLP and CSI projects focusing on education. Effective engagement with the relevant levels of government when implementing projects. In addition: Agreements with largest contractors to also contribute to education projects, in coordination with Kolomela's planned initiatives. Regular needs assessment at schools.	High Positive

1.5.1 Noise

Noise generation associated with activities at Kolomela (i.e. blasting, material handling, vehicle movement) has the potential to result in nuisance conditions for surrounding sensitive receptors. According to the Noise Impact Assessment (Airshed, 2021) only one receptor situated on a SIOC property may potentially be negatively affected close to the Kapstevel operations and the impacts associated with noise generation was assessed to have a moderate significance rating. Kolomela should continue with noise monitoring to ensure that noise levels remain within the relevant standards and additional mitigation may be required if increased levels are detected.

1.5.2 Water Courses (Wetlands and Drainage Lines)

Infrastructure and activities associated with Kolomela mine will cause the destruction of and indirect impacts on several wetland pans as well as episodic drainage lines. This is especially evident in the development of the Ploegfontein pits, the Klipbankfontein WRD, the extension of the Leeuwfontein WRD and development of haul roads. The significance rating was high for impacts associated with this infrastructure. Other infrastructure (i.e. Kapstevel DMS conveyor, waste tyre management facility, DSO conveyor and railway spur, low grade stockpiles, expansion of the exploration core yard) will also potentially result in impacts on water courses, but to a lesser extent especially if the mitigated layout alternatives are implemented. It is essential that adequate planning must be implemented during infrastructure development to minimise impacts on water courses at Kolomela.

1.5.3 Biodiversity - flora

- Infrastructure at Kolomela will entail the removal of natural vegetation. This will result in a loss of flora habitat and a loss of floral diversity. Kolomela must ensure that the remaining natural areas are managed and no further encroachment allowed.
- Infrastructure at Kolomela will also impact on floral Species of Conservation Concern (SCC). Permits must be obtained for the removal of such species. The proposed development will not impact on any threatened ecosystems. The development will, however, impact on CBA1 and ESA habitat (particularly within the central section of the focus area
- The perceived impact significance of Kolomela (prior to mitigation) on CBAs, ESAs, and Protected Areas flora habitat, diversity and SCC range from medium high (in the Mountain Bushveld habitat and wetland pans) to low (historic disturbed area). With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the focus area may be reduced to medium-low and very low levels for all the phases associated with the proposed development.

1.5.4 Biodiversity - fauna

- The perceived impact significance of Kolomela (prior to mitigation) on faunal habitat, diversity and SCC range from medium high to very low. The potential for local or regional impacts are unlikely if recommended mitigation measures are adhered to. If effective mitigation takes place at all stages of the proposed project, most of the impacts may be reduced to a lower significance rating.
- The most prominent threat to the faunal ecology within the focus area is the proposed development within the portions of natural Mountain Bushveld, Calcrete and Thornveld habitats. Impacts to SCC are anticipated as the focus area offers suitable habitat in terms of foraging and/or breeding for several SCC.
- The impacts associated with the PV solar facility on avifaunal SCC are of medium low to low significance levels, with higher impact significance activities occurring as a result of the establishment of the transformation of the Tarconanthus - Senegalia Thornveld. This activity will likely result in a decrease in avian richness and abundance of SCC within the study area. If effective mitigation takes place, most impact may be reduced to lower significance levels.

1.5.5 Groundwater

- According to Gradient (2021), it is expected that the groundwater drawdown during the Kolomela LOM within the existing monitoring as well as neighbouring and private boreholes will range between 3.0m (regional) to 50.0-100 mbsl (meters below static level) within close proximity to the pit footprints. It should be noted that the majority of properties being intercepted by the drawdown zone are owned by SIOC, however there are privately owned properties being impacted on as well especially towards the northern, South-Eastern and eastern perimeters. It should also be noted that the zone of impact does reach various boreholes which is current being utilised.
- The impact assessment (impact ratings) indicates moderate to high impacts on local and regional aquifers as a result of mine dewatering impacts from the Klipbankfontein, Leeuwfontein and Kapstevel opencast pits. Water quality impacts as indicated by the pollution plume models are rated as being mostly low to very low from the waste rock dumps and planned co-disposal facilities.

1.5.6 Land use

Current as well as future infrastructure development especially the pits and WRDs at Kolomela will result in a change of land use and reduce the capability of the land to provide grazing or other purposes. Although the infrastructure will cause a change in land use and capability, Kolomela has a land management plan in place in which the mine will enhance the capability of the remaining natural areas (with reference to the conservation areas) within the mining right as well as other SIOC owned properties in the surrounding areas.

1.5.7 Soil

The storage and handling of hazardous substances (i.e. hydrocarbons) at Kolomela during and construction and operational activities may result in spillages and soil pollution. Runoff from disturbed areas during construction may result in soil erosion and loss of topsoil. Soil compaction may also result in impacts on soil characteristics and land capability, especially adjacent areas. The establishment of pits and WRD (as well as other infrastructure) will entail the removal and stockpiling of topsoil to be used for rehabilitation purposes. This must be done correctly to ensure the integrity of the stockpiles for use in rehabilitation.

1.5.8 Disturbance of Heritage Resources

- An assessment of the possible impacts of Kolomela on graves and burial grounds has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative. No graves will be impacted by current or future activities.
- An assessment of the possible impacts of Kolomela on historical heritage resources has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative.
- An assessment of the possible impacts of Kolomela on the previously identified archaeological pan sites has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative.

1.5.9 Road Safety and Traffic Disturbance

It is anticipated that the total traffic will increase by 10% by the year 2028. This will affect user experience. In addition, there may be structural damage to local roads. It is proposed that upgrades be undertaken to alleviate the impact. These include geometric and structural upgrades of selected links. Some gravel roads may require surfacing and ones affected for short periods may require a more comprehensive maintenance plan including dust suppression.

Responsibility should be shared between the developers and the road owners (provincial, municipal and private). Alternative routes can also be investigated.

1.5.10 Social Impacts

1.5.10.1 Positive impacts

Kolomela mine already contributes significantly to the local and regional social economic environment in terms of the following:

Local procurement and enterprise development, local employment, catalyst for local economic development, enhancement of community skills levels, enhanced infrastructure development, improved access to, and quality of school education, improved access to, and quality of public healthcare services and support of the local municipality enhances service delivery

The expansion of the mining operations, including the various projects, will contribute to the above, even though more temporarily during the construction of the facilities such as the solar plant. The Kapstevel south development will have a longer positive impact as it has been planned to create significant socio-economic benefits for the Tsantsabane community, especially by means of employment, business opportunities, training and skills development. KSS mining will allow for mining at 14 Mtpa which will mean that jobs at Kolomela will be sustained.

1.5.10.2 Negative impacts

Negative impacts associated with the presence of a mine in a community are as follows. The development of the new infrastructure will contribute to these impacts, but Kolomela has a comprehensive Social Mine Plan in place to enhance the positive socio-economic contribution (especially from a local perspective) and to manage the negative social impacts.

Pressure on municipal services and capacity due rapidly growing population and demand for houses, a shortage of proper and affordable housing due to the demand created by mining (poor living conditions in informal settlements), increase in social ills, strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine

2. CONTACT PERSON AND CORRESPONDENCE ADDRESS

2.1 Details of EAP

2.1.1 The Environmental Assessment Practitioner (EAP) who prepared the report

Name of The Practitioner: Trevor Hallatt

Tel No.: 071 689 2229

Fax No.: 086 527 4619

e-mail address: trevor@exm.co.za

TABLE 2-1: EXPERTISE OF THE EAP.

EAP	Qualification	Years' experience
Trevor Hallatt	BSc Geography and Zoology (NWU) BA (hons) Environmental Management (NWU) MA Environmental Management (NWU)	> 10 Years
	South African Council for Natural Scientific Professions (SANASP) Registration no.: 300123/15	

CV with experience is attached as Annexure A.

3. DESCRIPTION OF THE PROPERTY

Refer to Figures 3-1 for locality map.

Farm Name:	Farm Leeuwfontein No. 488 Remaining Extent Farm Strydfontein No. 614 Plaas No. 476 Farm Ploegfontein No. 487 Remaining Extent Farm Klipbankfontein No. 489 Remaining Extent Farm Kapstevel No. 541 Portion 1 Remaining Extent Farm Kapstevel No. 541 Portion 3 Farm Kapstevel No. 541 Portion 2 Farm Kapstevel No. 541 Remaining Extent Plaas No. 485 Plaas No. 486 Farm Kappies Kareeboom 540
Application area (Ha	The mining right area covers 18 466 ha, of which 4 340 ha is already disturbed or will be disturbed by mining infrastructure footprints.
Magisterial district:	The Hay Magisterial District (Tsantsabane Local Municipality) ZF Mgcawu District Municipality

Distance and direction from nearest town	8 km south west of Postmasburg	
21-digit Surveyor General Code for each farm portion	Farm Leeuwfontein No. 488 Remaining Extent	C03100000000048800000
	Farm Strydfontein No. 614	C03100000000061400000
	Plaas No. 476	C03100000000047600000
	Farm Ploegfontein No. 487 Remaining Extent	C03100000000048700000
	Farm Klipbankfontein No. 489 Remaining Extent	C03100000000048900000
	Farm Kapstevel No. 541 Portion 1 Remaining Extent	C03100000000054100001
	Farm Kapstevel No. 541 Portion 3	C03100000000054100003
	Farm Kapstevel No. 541 Portion 2	C03100000000054100002
	Farm Kapstevel No. 541 Remaining Extent	C03100000000054100000
	Plaas No. 485	C03100000000048500000
	Plaas No. 486	C03100000000048600000
	Farm Kappies Kareeboom 540	C03100000000054000000
Locality map	Figure 4-1.	

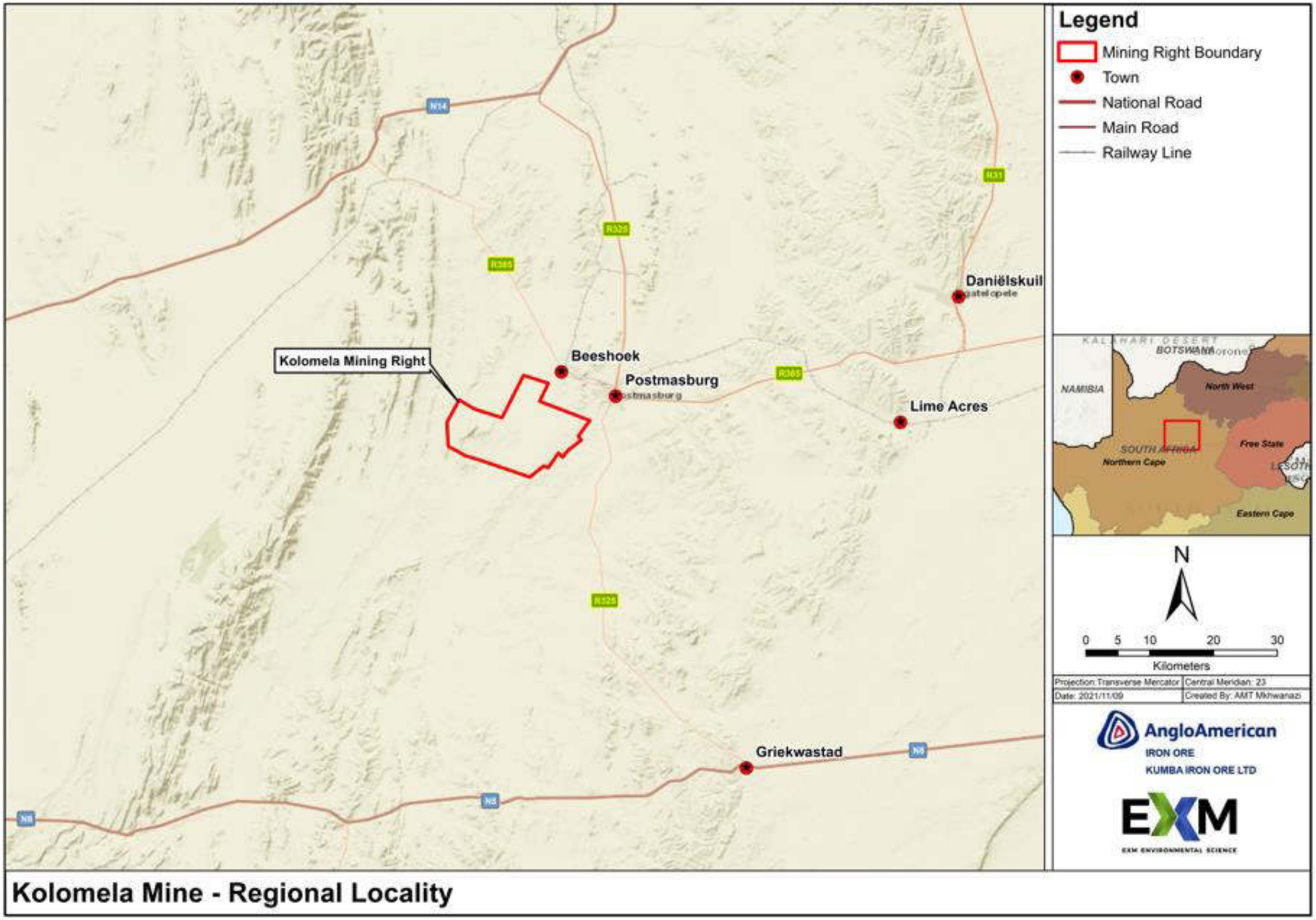


FIGURE 3-1: LOCALITY MAP

4. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

4.1 Background and introduction

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south west of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province. The Minister of Mineral Resources granted a mining right for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR} and is valid until 17 September 2038, unless cancelled or suspended.

Kolomela mine operates as a conventional open cast mine where ore is extracted by means of drilling, blasting, loading and hauling. Ore extracted from the pits is transported to a direct shipping ore (DSO) plant which involves the crushing and screening of recovered ore material into stockpiles of 'lump' and 'fines'. The processed iron ore is loaded onto an internal railway line which is connected to a direct rail link to Transnet's Sishen-Saldanha railway line from where the iron ore is transported to the Port of Saldanha for export. Kolomela Mine also utilises a Modular Dense Media Separation (DMS) Processing Plant for the processing of low grade ore not suitable for processing at the DSO plant. Kolomela produced 10.8 million tonnes during its first full year of production in 2013 and currently produces 13-14 million tonnes per annum (Mtpa) facilitated by enhanced stripping techniques and processing of 1-3 Mtpa of lower grade of ore at the Tierbult DMS Modular Plant.

Iron ore is currently extracted from three opencast pits, namely Klipbankfontein, Leeuwfontein and Kapstevel North. Kolomela is in the process of developing the Kapstevel South Pit which is required to sustain the mining production at approximately 14 Mtpa (Mtpa) until 2031. The current the Life of Mine (LoM) including the Kapstevel South Pit currently stands at 2032, but with the potential to be extended in future with the development of the Ploegfontein, Tierbult and Heuningkranz ore bodies, the mining of which are already authorised.

Kolomela proposes to expand and amend some of the existing activities and also develop new infrastructure to support continued and future production at the mine. This includes:

- Amendment of the Kapstevel South Pit footprint area.
- Amendment of the Kapstevel Waste Rock Dumps and haul roads.
- Amendment of Kapstevel Evaporation Ponds and stormwater management infrastructure.
- Additional park-up, laydown and ore stockpile areas.
- Development of new DMS tailings management infrastructure
- A new Photovoltaic Solar Facility.
- A new Waste Tyre Management Facility.
- A conveyor and railway line to transfer material to and from the DMS plant.

- Amendment to the future Kapstevel DMS conveyor footprint to facilitate widened haul roads.
- Amendment of Kapstevel Waste Rock Dumps and Additional Waste Rock Dumps.
- Additional Low Grade Ore Storage Areas.
- New radio masts and LTE towers.
- Provision for an area of relaxation and safety berms around pits.

The existing infrastructure at Kolomela mine is shown in Figure 4-1.

The new and expanded infrastructure at Kolomela mine is shown in Figure 4-2.

The cumulative footprint (existing and new/expanded) is shown in Figure 4-3.

Authorisation is being sought from the Department of Mineral Resources & Energy (DMRE) for activities listed under the National Environmental Management Act (No. 107 of 1998) and the National Environmental Management: Waste Act (No. 59 of 2008) as well as amendment of the environmental management programme in terms of Section 102 of the Minerals & Petroleum Resources Development Act (No. 28 of 2002). This will be supported by a Scoping Study and an Environmental Impact Assessment (EIA).

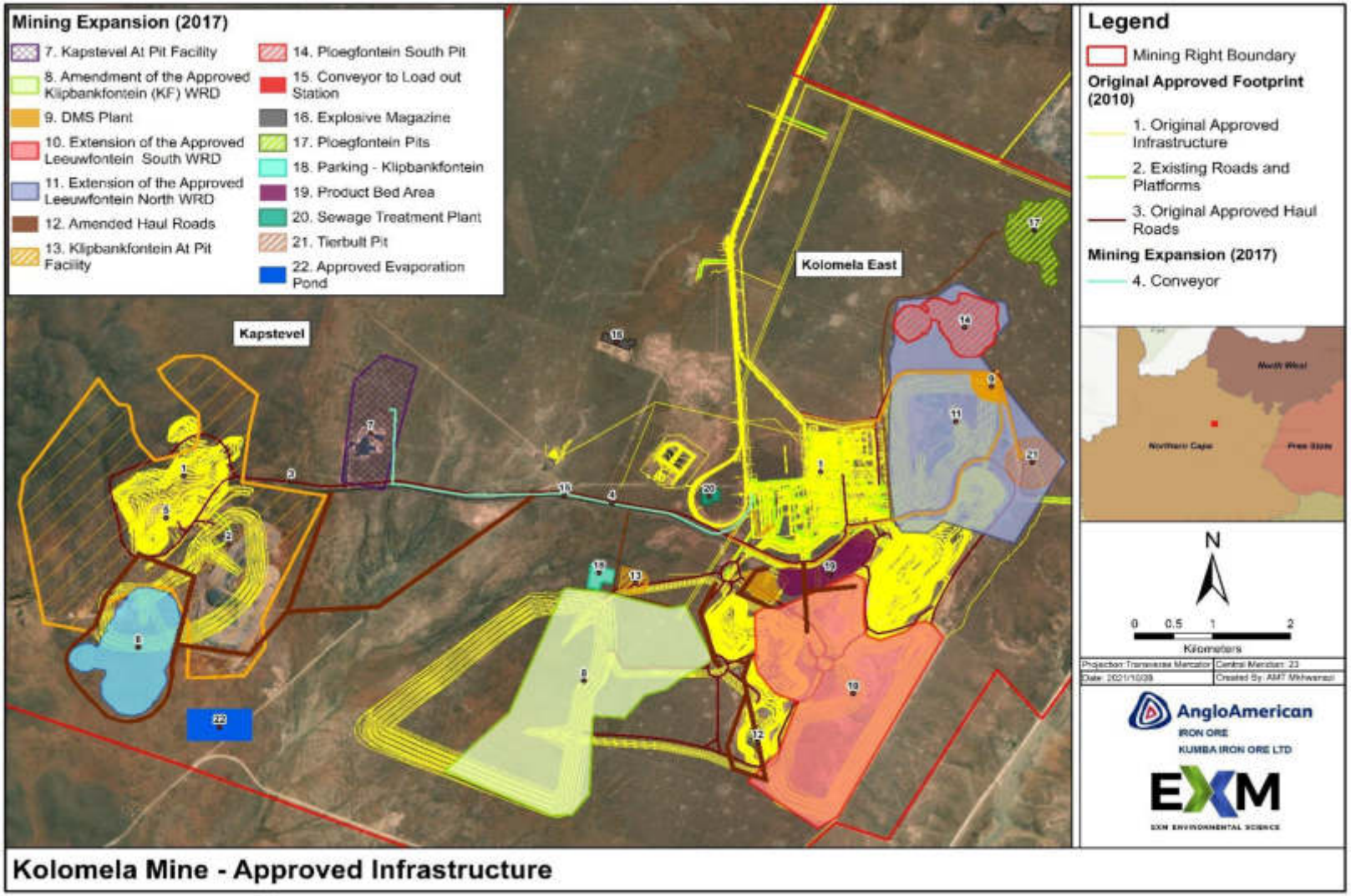


FIGURE 4-1: EXISTING INFRASTRUCTURE AND ACTIVITIES AT KOLOMELA MINE

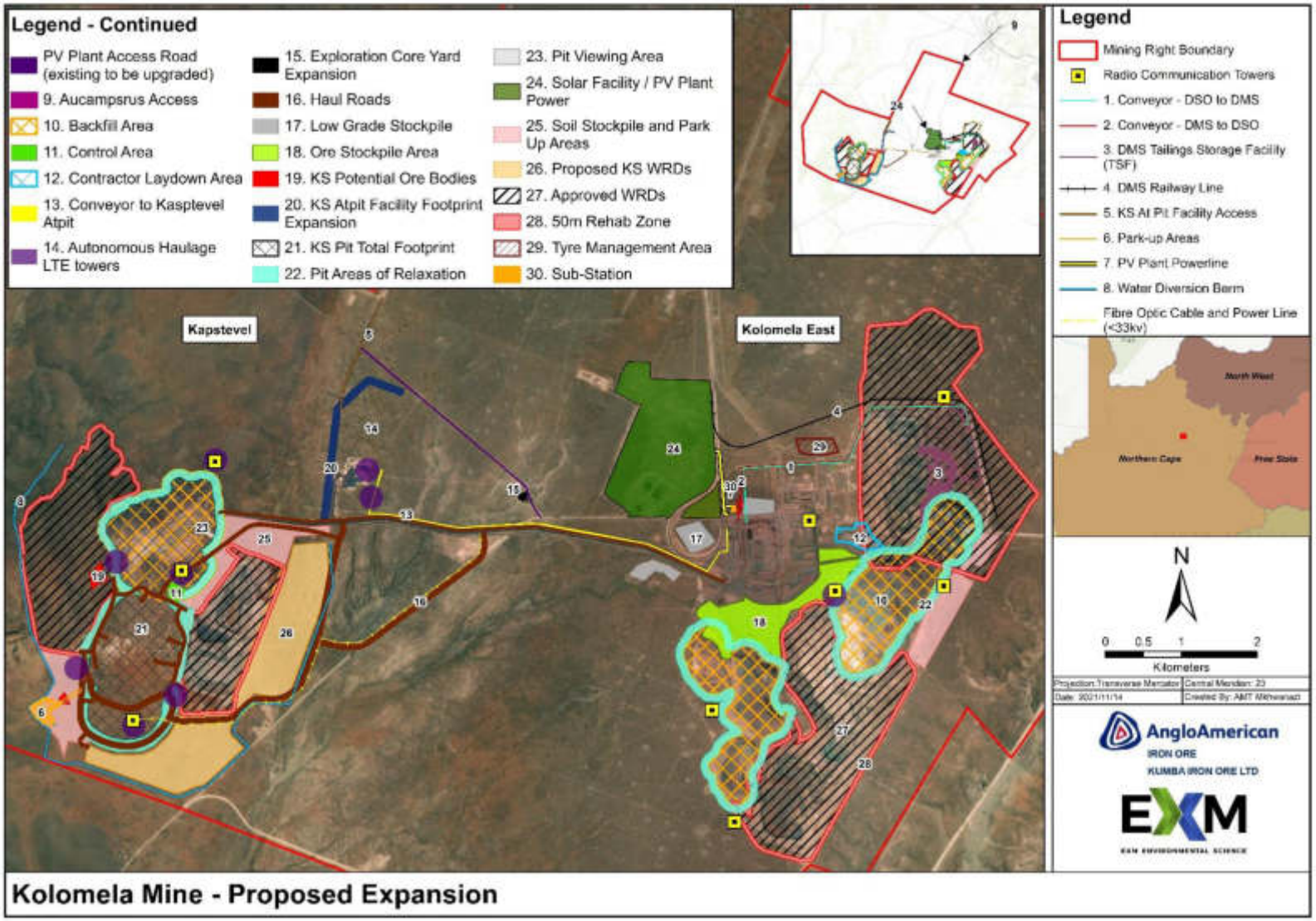


FIGURE 4-2: PROPOSED NEW AND EXPANDED INFRASTRUCTURE AND ACTIVITIES AT KOLOMELA MINE

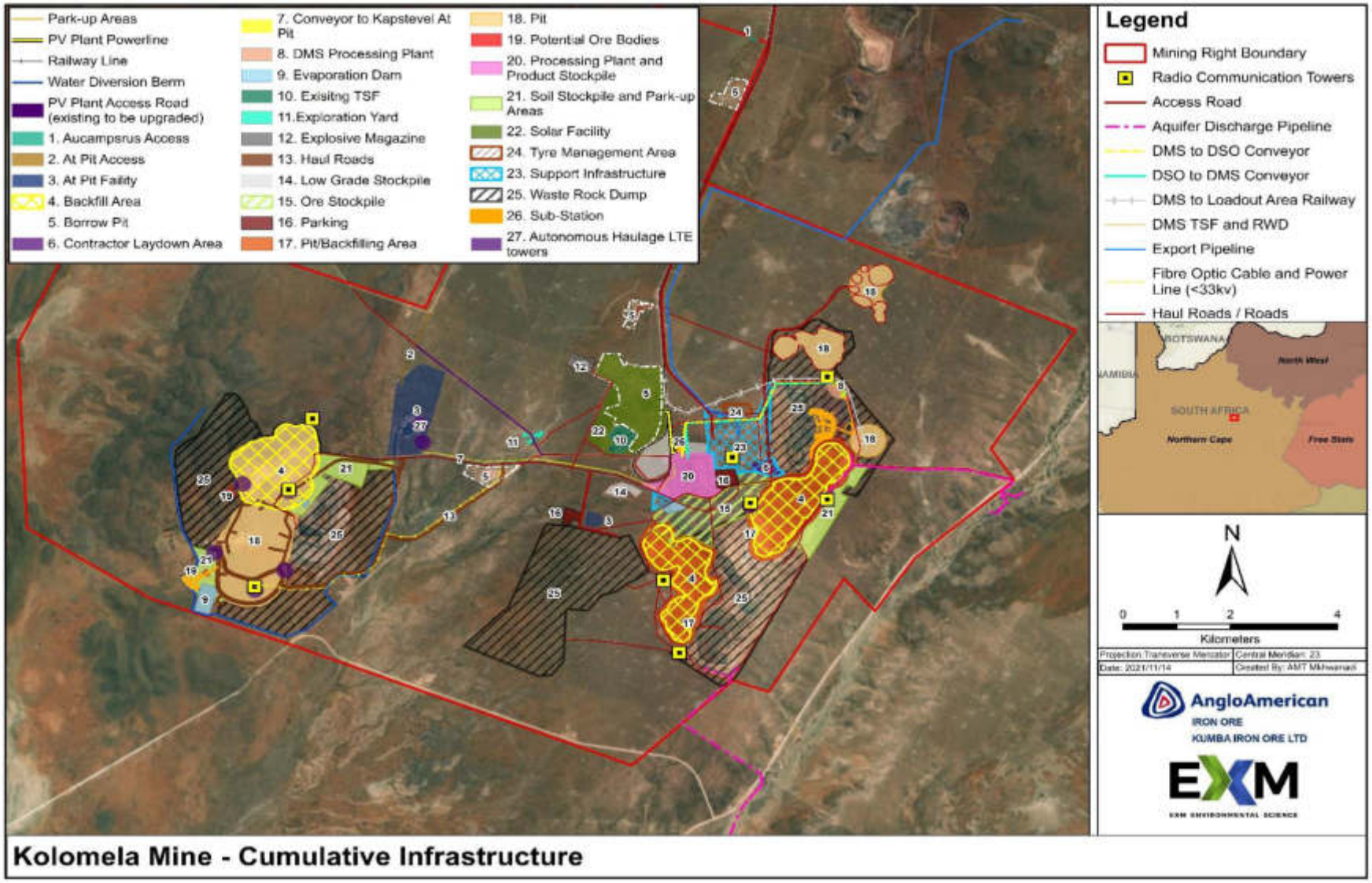


FIGURE 4-3: CUMULATIVE FOOTPRINT EXISTING AND EXPANDED/NEW INFRASTRUCTURE AND ACTIVITIES AT KOLOMELA MINE

4.2 Listed and specified activities

Name of Activity	Applicable Listing Notice
(1) Haul roads	
a. Kolomela Access Road	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 24** Development of a road **Activity 56** The widening of a road by more than 6 metres **GNR 629** **Activity 12** Clearance of vegetation within a CBA. **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
b. Perimeter fence and road	
c. Haul roads and secondary roads	
d. Kapstevel At-pit Facility Access road	
e. Haul roads to Klipbankfontein Pit and Leeuwfontein South WRD.	
f. Kapstevel haul roads.	
g. Upgrade of road for access to PV Plant	
(2) Other linear infrastructure	
a. Sishen South Pipeline and Reservoir	**GNR 627** **Activity 9** Pipelines **Activity 27** Vegetation clearance for pump station
b. Railway Line to Beeshoek	**GNR 627** **Activity 24** Development of a road **Activity 27** Vegetation clearance
c. DMS to DSO conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **Activity 27** Vegetation clearance **GNR 629** **Activity 8** Development of conveyor within (or within 100 m) of a watercourse
d. DMS to load out station railway	**GNR 627** **Activity 12** Infrastructure within a watercourse
e. DSO to DMS conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **Activity 27** Vegetation clearance **GNR 629** **Activity 8** Development of conveyor within (or within 100 m) of a watercourse
f. Artificial aquifer discharge pipeline	**GNR 627** **Activity 12** Infrastructure development within a water course
g. Kapstevel DMS conveyor	**GNR 627** **Activity 12** Infrastructure within a watercourse **GNR 629**

Name of Activity	Applicable Listing Notice
	Activity 8 Development of conveyor within (or within 100 m) of a watercourse **Activity 12** Clearance of vegetation within a CBA. **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(3) Storage and management of hazardous substances	
a. Fuel Depot – Diesel and Lubricants	**GNR 628** **Activity 4** Storage and handling of a dangerous goods > 500m^3 **GNR 627** **Activity 34** Fuel storage expansion – need for Atmospheric Emissions Licence **Activity 51** Fuel storage expansion > 80 m^3.
b. Other fuel storage tanks i. Loco refuelling station. ii. LDV refuelling.	**GNR 628** **Activity 4** Storage and handling of a dangerous goods > 500m^3
c. Explosives magazine	**GNR 627** Activity 14 Storage of dangerous goods > 80m^3 **Activity 27** Vegetation clearance **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(4) Tailings Management Infrastructure	
a) DMS Tailings Management Infrastructure i. TSF on WRD. ii. Pipelines. iii. Return water dam for TSF. iv. DMS return water dam. v. Paddocks.	• **TSF** None • **Pipeline** **GNR 627** **Activity 9** Pipelines. • **Return Water Dam** **GNR 627** **Activity 13** Water storage **GNR 628 (2017) – LN2** **Activity 6** Activity requiring WUL **GNR 921** **Category B** **Activity 10** Construction of a waste management activity listed in Category B of this Schedule. **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11** Residue stockpiles or residue deposits.

Name of Activity	Applicable Listing Notice
b) Slimes dam for receiving material from the DSO plant	**GNR 627** **Activity 24** Development of a road **Activity 27** Vegetation clearance **GNR 628** **Activity 16** Development of a dam with a wall > 5m **GNR 628 (2017) – LN2** **Activity 6** Activity requiring WUL
(5) Supporting Infrastructure	
a. Supporting infrastructure i. Offices. ii. Security centre. iii. On-boarding centre. iv. Parking for support staff and haul roads. v. Workshops/laydown areas. vi. Warehouses.	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. Construction village – currently used for offices.	**GNR 627** **Activity 27** Vegetation clearance **Activity 28** Transformation of land
c. Kapstevel At Pit Facility	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **GNR 628** **Activity 6** Activity which requires a WUL (PCD) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
d. Parking at Klipbankfontein	**GNR 627** **Activity 27** Vegetation clearance
e. Park Up and Soil Stockpile Areas	**GNR 627** **Activity 12** Infrastructure within a watercourse **Activity 14** Storage of dangerous goods > 80m^3 **Activity 24** Development of a road **Activity 27** Vegetation clearance
f. Solar PV Facility	**GNR 627** **Activity 12** Infrastructure within a watercourse

Name of Activity	Applicable Listing Notice
	GNR 628 **Activity 2** Generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more. **Activity 15** Vegetation clearance > 20ha **GNR 629** **Activity 12** Clearance of vegetation within a CBA.
g. Aucampsrus Access Gate Area	N/A
h. Welgevonden exploration core yard	N/A
(6) Processing Plants and Supporting Infrastructure	
a. DSO plant and product stockpile areas	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. DMS Processing Plants (Kapstevel and Tierbult)	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **GNR 628** **Activity 6** Activity which requires a WUL (PCD) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(7) Opencast Pits	
a. Opencast Pits, including Abandonment Berms i. Leeuwfontein ii. Ploegfontein (North and South) iii. Klipbankfontein iv. Tierbult **v.** Kapstevel (North and South)	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 13** Storage of water > 50 000m^3 **Activity 24** Development of a road **Activity 56** The widening of a road by more than 6 metres **GNR 628** **Activity 6** Activity which requires a WUL (evaporation ponds) **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right.

Name of Activity	Applicable Listing Notice
	GNR 629 **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(8) Waste Management Activities	
a. Waste Rock Dumps i. Leeuwfontein North and South ii. Klipbankfontein iii. Kapstevel	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 24** Development of a road **Activity 56** The widening of a road by more than 6 metres **GNR 628** **Activity 15** Vegetation clearance > 20ha **Activity 17** Activities requiring a mining right. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse. **GNR 921** **Category A: Activity 13** The expansion of a waste management activity. **Category B** **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11** Residue stockpiles or residue deposits.
b. Use of plant discard and waste rock for construction of roads and other infrastructure	**GNR 921** **Category B** **Activity 2** The reuse or recycling of hazardous waste
c. Waste Tyre Management Facility	**GNR 627** **Activity 12** Infrastructure within a watercourse. **Activity 27** Vegetation clearance
d. Co-disposal of tailings with waste rock (backfilling and on WRDs)	**GNR 627** **Activity 9** Pipelines. **GNR 921** **Category B** **Activity 7** The disposal of any quantity of hazardous waste to land.
e. Backfilling of waste rock (Leeufontein, Klipbankfontein and Ploegfontein Pits)	**GNR 921** **Category B** **Activity 7** The disposal of any quantity of hazardous waste to land. **Activity 11**

Name of Activity	Applicable Listing Notice
	Residue stockpiles or residue deposits.
(9) Kapstevel Stormwater Infrastructure	
a. Kapstevel Evaporation dams	**GNR 628** **Activity 15** Vegetation clearance > 20ha **GNR 627** **Activity 13** Storage of water > 50 000m^3
b. Amended Kapstevel diversion berm	N/A – linear activity
(10) Sewage Management	
a. Sewage Treatment Works	**GNR 627** **Activity 12** Infrastructure within a watercourse. **GNR 629** **Activity 14** Infrastructure a footprint > 10 m^2 within a watercourse.
(11) Stockpile areas	
a. Ore Stockpile Area	**GNR 628** **Activity 15** Vegetation clearance > 20ha
b. Low Grade Product Storage Areas	**GNR 627** **Activity 12** Infrastructure within a watercourse **GNR 628** **Activity 15** Vegetation clearance > 20ha
(12) Exploration sites	
a. Exploration sites	**GNR 628 (2017) – LN2** **Activity 15** The clearance of an area of 20 hectares or more of indigenous vegetation.

4.3 Description of activities to be undertaken

4.3.1 Opencast Pits

Current opencast mining activities take place within the Leeuwfontein, Klipbankfontein and Kapstevel North Pits. The Kapstevel South Pit is being developed with the first ore to be extracted in 2024 and required to sustain ore production at 14 Mtpa until 2031. Future pits planned and authorised include the Tierbult Pit, Ploegfontein and Ploegfontein South Pits (Table 5-1). The Kapstevel South Pit layout is being changed from previously approved in order to facilitate a change in mine planning at the pit.

The current approved footprints for the Kapstevel South and North Pits are 147 ha and 140 ha, respectively. Exploration data has revealed larger ore bodies at the Kapstevel South and North pits and the pit footprints will be extended with the north pit being 165 hectares and the south pit being 200 ha. Figure 4-4 shows the approved Kapstevel north and south footprints compared to the amended pit footprint (Kapstevel Total Pit Footprint).

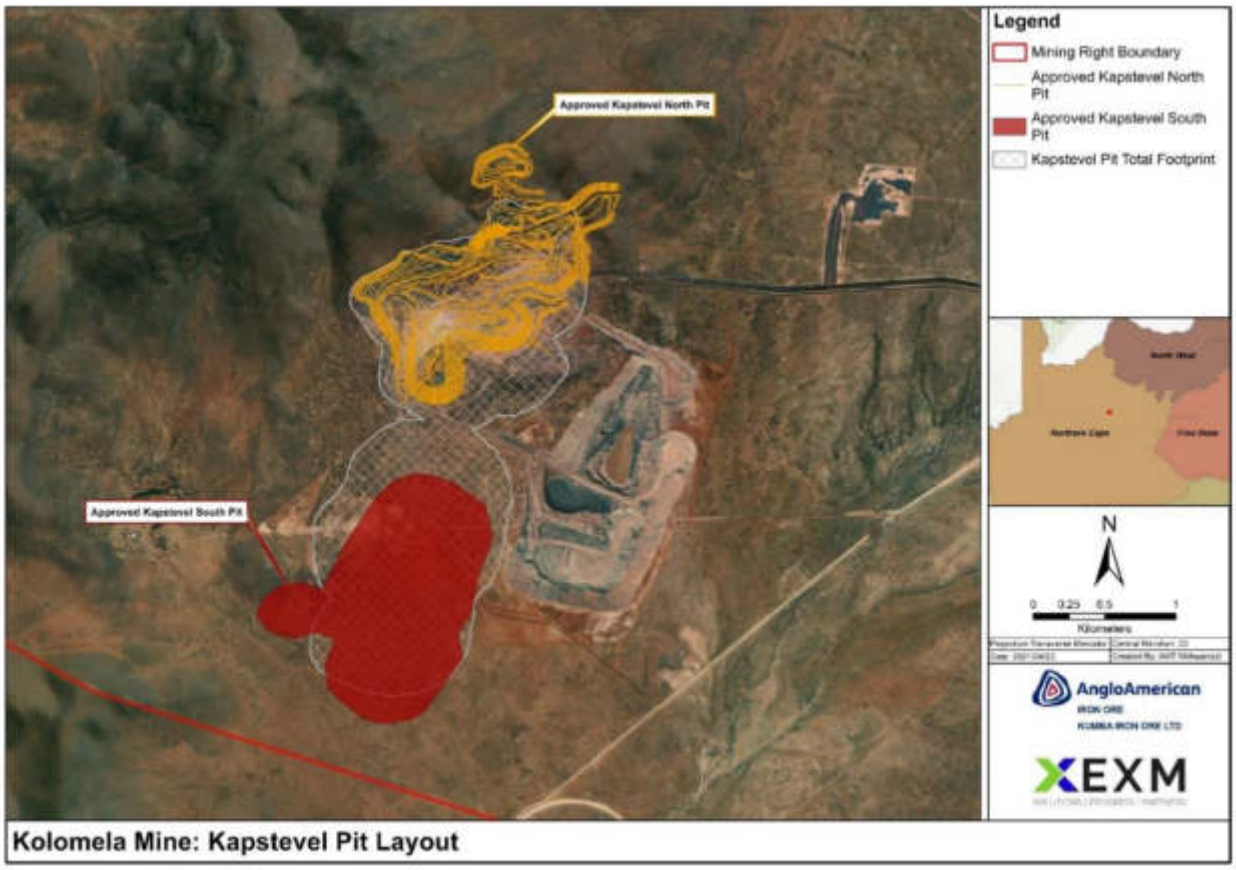


FIGURE 4-4: KAPSTEVEL APPROVED FOOTPRINT COMPARED TO AMENDED FOOTPRINT

Kolomela is increasingly investigating strategies for the backfilling of waste rock into the opencast pits and have already commenced with the backfilling of the Leeuwfontein Pit. The footprint of the approved Leeuwfontein Waste Rock Dump (WRD) will result in the complete backfilling of the Tierbult Pit and Ploegfontein South Pit areas and the northern section of the Leeuwfontein Pit. The establishment of the approved Kapstevel WRD will result in the backfilling of the Kapstevel North Pit. It is proposed to extend the backfilling footprint to incorporate the remaining section of the Leeuwfontein Pit and the Klipbankfontein Pit.

TABLE 4-1: KOLOMELA OPENCAST PITS

Opencast Pit	Surface Area	Description
Leeuwfontein Pit	165 ha	Existing pit, backfilling in process and to be completely backfilled.
Klipbankfontein Pit	131 ha	Existing pit to be backfilled by Leeuwfontein South WRD.
Ploegfontein Pit	128 ha	Future authorised pit development.
Ploegfontein South Pit	75 ha	Future authorised pit development to be backfilled by Leeuwfontein North WRD.
Tierbult Pit	35 ha	Future authorised pit development to be backfilled by

Opencast Pit	Surface Area	Description
		Leeuwfontein North WRD.
Kapstevel North Pit	165 ha	Existing pit to be completely backfilled with waste rock from Kapstevel South Pit.
Kapstevel South Pit	200 ha	Pit development in process.

4.3.2 Pit Abandonment Berms

A possible method to minimise the risk of inadvertent public access to open pit voids involves the construction of an abandonment berm around the perimeter of the open pit after mining has been completed at all the respective pits. A geotechnical assessment was conducted to predict long-term failback zones around the perimeter of the pits in order to ensure long-term sustainability of abandonment berm as a mitigation measure. The footprint associated with the failback zones and abandonment berms has thus been included as future areas adjacent to the pits. Figure 4-5 below provides an illustration of the area of relaxation and abandonment berms.

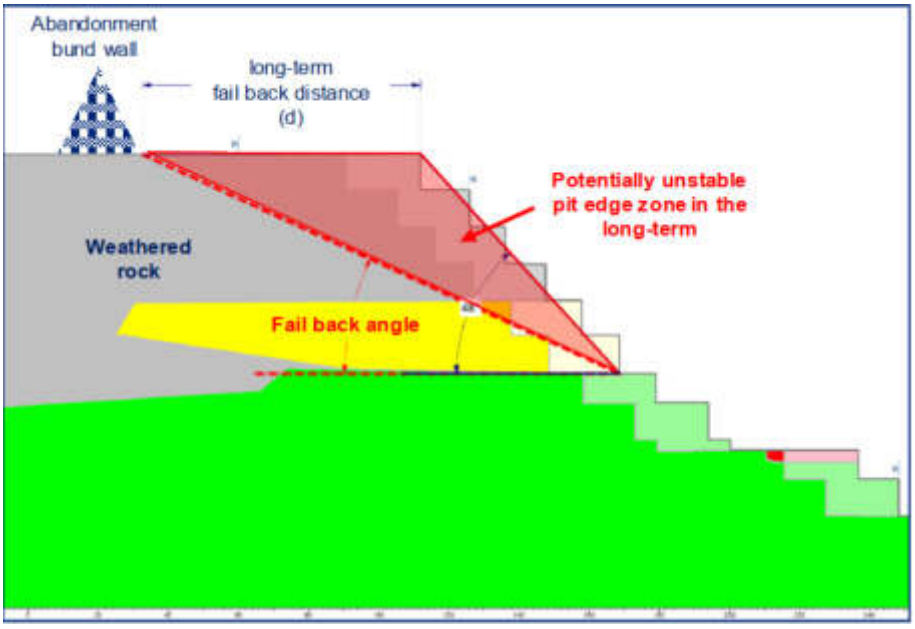


FIGURE 4-5: AREA OF RELAXATION AND ABANDONMENT BERM ILLUSTRATION

4.3.3 Waste Rock Dumps

Kolomela existing and proposed WRDs are given in Table 4-2.

TABLE 4-2: SUMMARY OF WASTE ROCK DUMPS

Waste Rock Dump	Surface Area	Description
Leeuwfontein North WRD	608 ha	Existing, includes backfilling of Leeuwfontein North Pit and future Ploegfontein South and Tierbult Pits.

Waste Rock Dump	Surface Area	Description
Leeuwfontein South WRD	469 ha	Existing, includes backfilling of the Klipbankfontein Pit.
Klipbankfontein WRD	485 ha	Proposed future development.
Kapstevel WRDs	833 ha	Waste from Kapstevel North and South Pits.

The footprint of the Leeuwfontein North WRD will result in the complete backfilling of the Tierbult Pit and Ploegfontein South Pit areas once developed. Leeuwfontein South WRD will result in the partial backfilling of the Klipbankfontein Pit.

The Kapstevel WRD has been revised from that originally approved. This is due to exploration data having revealed potentially viable ore bodies located within the existing approved footprint of the western section of the dump footprint area. Kolomela thus proposes to now establish two WRDs to the south and east of the existing WRD footprint to avoid the ore bodies should they be deemed feasible to be mined in the future. The newly proposed southern WRD will cover approximately 115 ha and the eastern WRD will cover approximately 220 hectares, of which 27 ha are located on the approved Kapstevel WRD footprint. The original approved footprint has also been amended to the north of Kapstevel North Pit avoid heritage resource of high significance in that area.

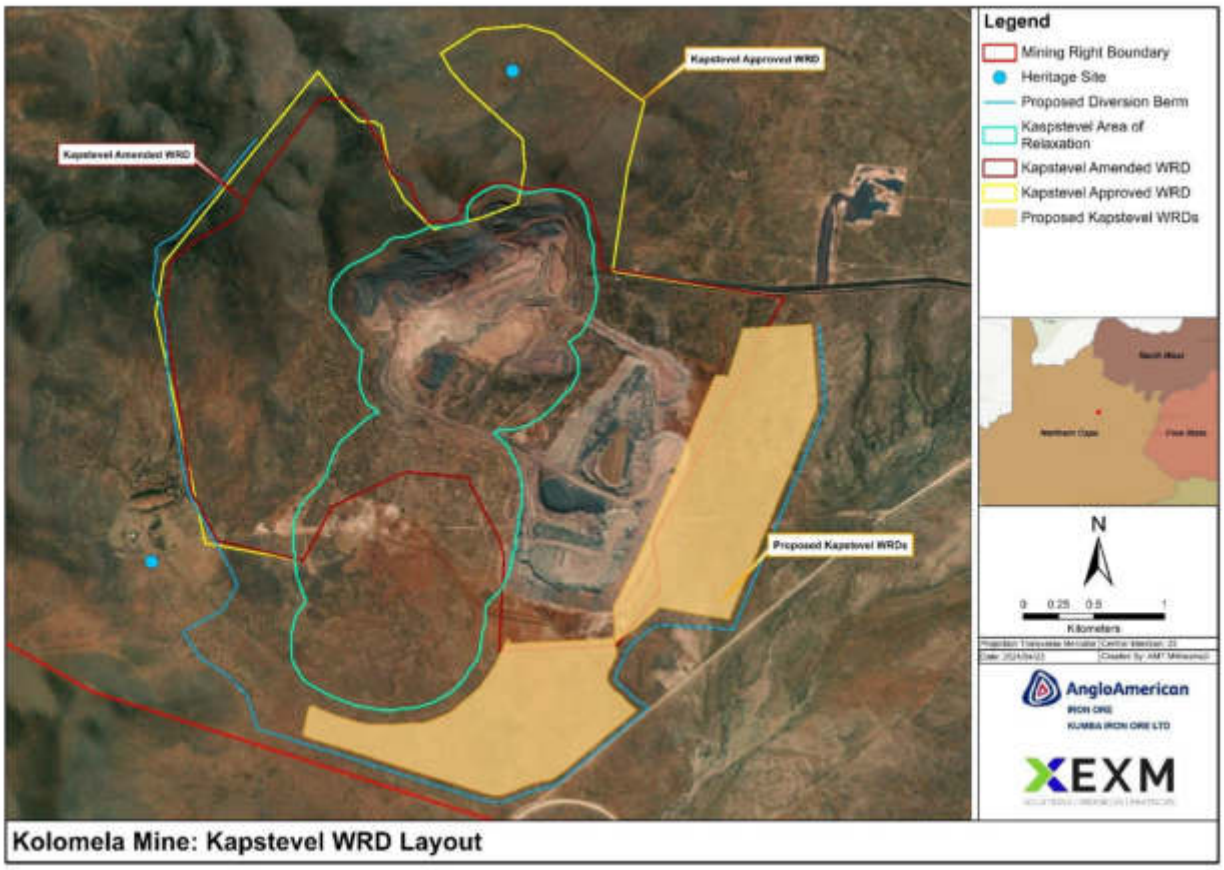


FIGURE 4-6: KAPSTEVEL SOUTH REVISED FOOTPRINT

A 50 m buffer area has now also been allocated around all of the approved Kolomela WRDs. This additional proposed disturbance footprint is to allow for the sloping of the waste rock dumps as part of the rehabilitation.

4.3.4 Stormwater Management Infrastructure at Kapstevel

The footprint and route of the approved clean and dirty water diversion berms at Kapstevel have also been amended in line with recent survey data in order to optimally use the natural topography for water conveyance. Trenches will be constructed on both side of the berm to convey clean water runoff from the environment on one side and dirty water runoff from the WRD on the other. The diversion berm will be approximately 7.7 km in length. Figure 5-6 illustrates the layout of the amended stormwater infrastructure for Kapstevel.

Run-off that collects within the pits during rainfall events is pumped to evaporation ponds in order to allow for safe mining activities continue within the pits. There are existing evaporation ponds at Leeuwfontein and Klipbankfontein but no ponds have been developed at Kapstevel to date. Two evaporation dams have also been approved and is still to be developed to pump water from the Kapstevel north and south pits (see Figure 4-7).

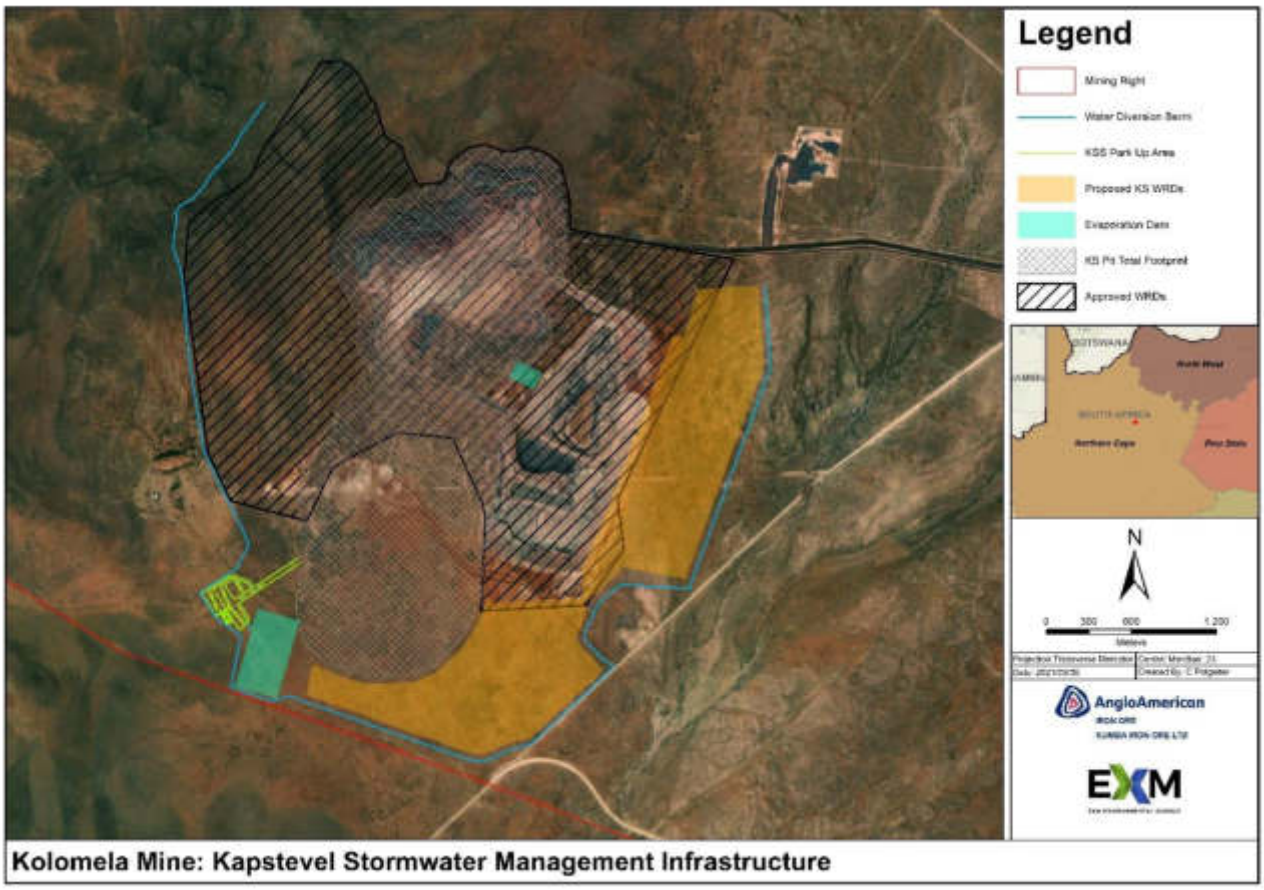


FIGURE 4-7: STORMWATER MANAGEMENT INFRASTRUCTURE FOR KAPSTEVEL

Run-off collected in the Ploegfontein Pits area will be pumped also be pumped to an evaporation pond which is included in previous authorisations.

4.3.5 Haul Roads

Haul roads for the Leeuwfontein Pit and WRD area and Klipbankfontein Pit as well as roads that connect infrastructure within Kolomela operations were constructed as part of the original Kolomela mine development. The roads are approximately 30 m wide and have a combined length of 44 km. Four new haul roads have been constructed to facilitate movement of haul trucks between the run of mine (ROM) stockpile area, the Klipbankfontein Pit and the Leeuwfontein South WRD. The haul roads have a width of 30 m and will cover a distance of approximately 3.3 km.

Kolomela has identified the need to partially shift towards Autonomous Haul Trucks to optimise mining from the Kapstevel South Pit. The simultaneous operation of autonomous haul trucks together with the current haul truck fleet and Light Duty Vehicles (LDV) requires amendment to the haul roads due to safety requirements. It is proposed to widen the existing Kapstevel haul

roads and to establish additional haul roads. Additionally, it is proposed to develop a powerline (<33 kilovolts) and establish fibre optic cables within the corridor/reserve as indicated in Figure 4-2.

Due to the changes in infrastructure layouts (especially the Kapstevel WRD and pits), the haul roads previously approved to facilitate mining of the Kapstevel South Pit are no longer practical as indicated in Figure 4-8. New haul road positions are proposed to accommodate the updated layouts with sufficient width to allow simultaneous operation of autonomous haul trucks and the current haul truck fleet. A haul road will also be constructed to gain access to the Ploegfontein pits which will be 4.7 km in length and 30 m wide. This will only be developed once the mining of Ploegfontein commences. Bypass cubbies will be put in place along autonomous haul roads, this is to allow slow moving vehicles to exit the haul road. In some places passing cubbies will be created.

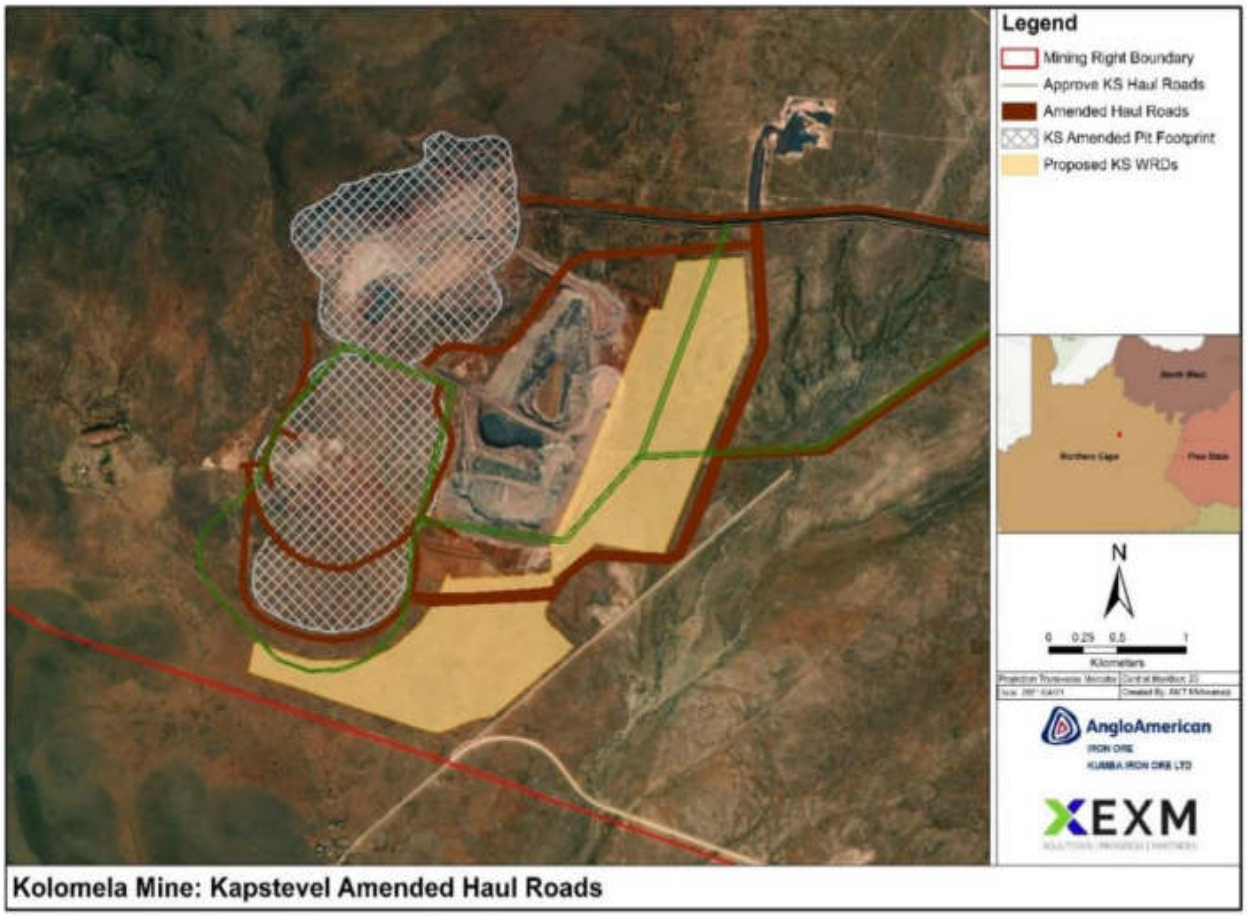


FIGURE 4-8: AMENDED KAPSTEVEL HAUL ROADS COMPARED TO APPROVED HAUL ROADS

4.3.6 Autonomous haul trucks

The operation of autonomous haul trucks at Kolomela mine will require (apart from the wider

roads) the following supporting infrastructure (as shown in Figure 4-9):

- Additional LTE towers to be installed at strategic positions (no listed activities triggered).
- Modification of product stockpile area.
- Control area that will include offices, ablutions, parking, kitchen, global navigation satellite system.
- A pit viewing area that will comprise of a prefabricated viewing platform and entertainment building within a fenced-off area. This will be located on top of the Kapstevel north dump.

4.3.7 Park Up and Soil Stockpile Areas

Due to safety considerations, no vehicles are allowed within a 500 m radius from the pits during blasting and must therefore be moved outside this perimeter. Kolomela has also identified the need to develop additional areas for the stockpiling of topsoil that is stripped during the development of the pits. Therefore, Kolomela proposes to develop three areas that will serve a dual purpose for the parking of trucks during blasting and the stockpiling of topsoil (demarcated and separate from parking area). Three such areas are proposed as indicated in Figure 4-1 and 4-3. The first two areas will be located at the Kapstevel North Pit and west of the Leeuwfontein Pit. These areas will cover a total area of 140 ha of which 93 ha will be located on existing authorised/disturbed areas.

The Kapstevel South Pit will be located a considerable distance from any areas dedicated to park vehicles. Kolomela therefore proposes to establish an area south of the Kapstevel South Pit to park mining vehicles during blasting events or during shift changes. A portion of this area will also be used for the stockpiling of soil. The facility will cover approximately 53 ha. Runoff from the facility will be diverted to one of the Kapstevel Evaporation Dams.

4.3.8 DSO Processing Plant

Kolomela operates a Direct Shipping Ore (DSO) facility which includes primary, secondary and tertiary crushers. A screening plant has also been developed to screen material from the secondary crusher to divert material larger than 25 mm to the tertiary crusher. Screened material reports to the blending beds where the ore is stacked and reclaimed before being conveyed to the load out station for deposition onto the wagon trains. The DSO, including the stockpile areas cover approximately 60 hectares on existing disturbed areas.

Ore is stockpiled in an area of approximately 44 ha south of the DSO Processing Plant. Kolomela is proposing to expand the storage capacity on already approved footprints, which forms part of this application process. The expanded stockpile areas will cover approximately 145 hectares

and will be situated on existing disturbed and approved footprints (Figure 5-7). No new listed activities are triggered.

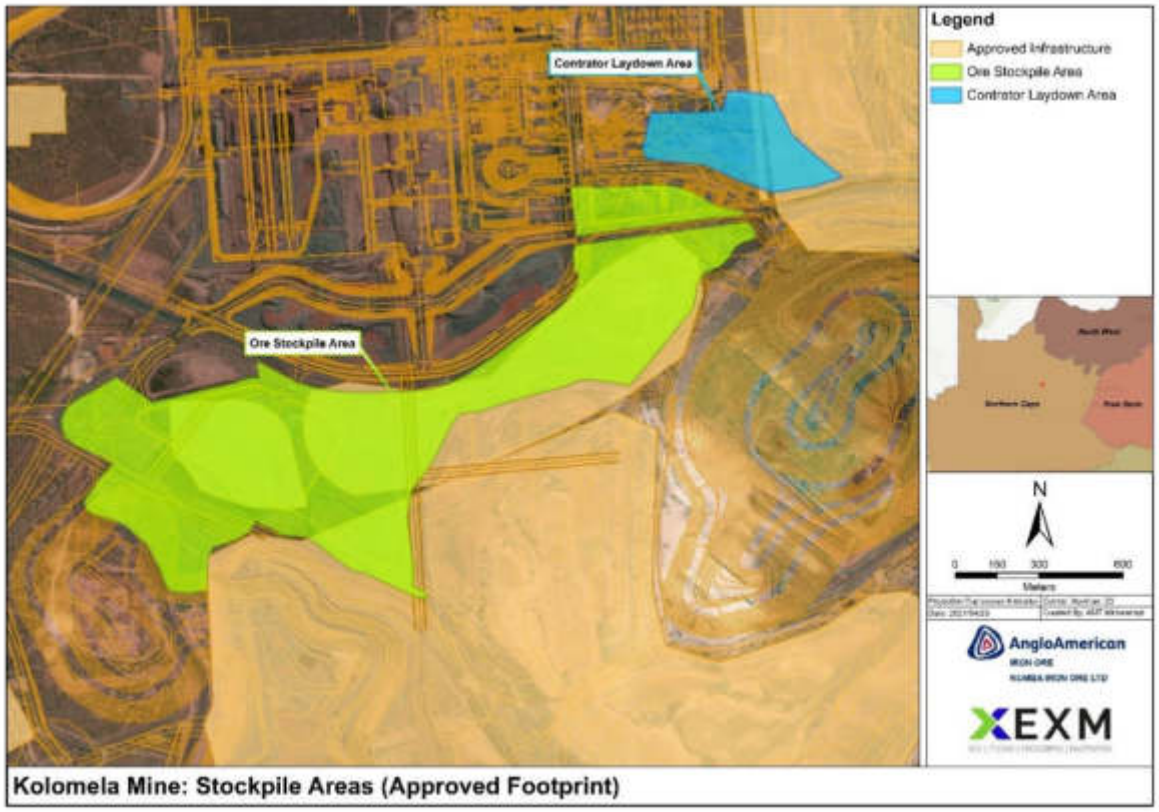


FIGURE 4-9: EXPANDED ORE STOCKPILE AREAS AT DSO PLANT

4.3.9 DMS Processing Plants

Kolomela mine currently utilises a Modular Dense Media Separation (DMS) Processing Plant (referred to as the Tierbult DMS Plant) for the processing of 1-3 Mtpa of low grade ore. The DMS plant is used for the processing of low grade ore not suitable for processing at the DSO plant. Two additional DMS plants were authorised to be constructed: one at the new Kapstevel at Pit Facility and one close to the Klipbankfontein Pit that will be developed in future according to market demand and the mine's development.

Kolomela is authorised to establish a conveyor to transport product (processed low grade ore) from the Kapstevel DMS Plant once developed to the product load out area at the DSO plant. However, due to the widening of the haul roads (as described above) the footprint of the conveyor will have to be moved/moved slightly to the north as indicated in Figure 4-13. The conveyor will be 5.5 km in length and 20 meters wide.

4.3.10 DSO Tailings Storage Facility

Kolomela has developed a Tailings Storage Facility (TSF) for the deposition of slimes emanating from the wet scrubber system to remove the excess dust from the crushing and screening processes at the DSO Processing Plant. This enables the settlement and consolidation of the solid particles and the recovery and re-use of the overflow/supernatant water. The TSF covers approximately 14 ha and is located north-east of the DSO plant.

Water from the TSF enters a RWD with a capacity of 427 500 $m^{3,}$ the water is recycled for us at the processing plant. There are no planned changes to the DSO TSF.

4.3.11 DMS Tailings Storage Facility

Slimes produced at the DMS plant are currently temporarily stored and conditioned at the DMS plant prior to blending with waste rock prior for final co-disposal at WRDs. Kolomela proposes to develop a TSF on the existing Leeuwfontein WRD to dispose of slimes produced at the DMS plant (Figure 4-11). The facility will cover approximately 24 ha. The TSF will comprise of four tailings containment cells with a volumetric airspace (cumulative) of 1 445 000 m^3 and an estimated tailings disposal capacity: 2,890,000. The containment cell walls will be constructed by using compacted waste rock. The total quantity of waste rock required is 1 01 000 m^3 or 1 819 800 tonnes with a crest height of waste rock containment walls: 17.5 m.

Disposal will involve deposition of "Wet cake" tailings in the containment cells, in thin (less than 300 mm deep) dozer spread layers, to maximize solar drying, desiccation and strength gain of the tailings product. The "Wet cake" will be stockpiled along the inner crest of the containment walls and allowed to sundry before it is pushed/spread into the containment cells. Current initial tailings rates-of-rise (ROR) will be approximately 1.8 m / year (150 mm per month), reducing to 1.0 m / year (85 mm per month) towards the end-of-life of the facility.

Storm water run-off from the TSF cells will be collected and attenuated at a fixed location in each of the cells and diverted to a central Return Water Dam which will cover approximately 3 ha. A minimum freeboard of 0.8 m will be catered for above the maximum predicted water level in each of the cells, when based on the 1 in 50 year, 24 hour storm event. Collected storm water run-off will be pumped to the pollution control dam facilities at the DMS Plant site for reuse.

Tailings with poor handleability, trafficability and stability characteristics will be conditioned (dried) in paddocks at the DMS plant, before rehandling and onward disposal at the TSF. The facility will comprise of four (4) drying paddocks with a cumulative volume of 42 500 m^3 and will have an estimated tailings conditioning capacity of 85 000 tonnes (approximately 5 months tailings production). The paddock walls will have a height of 2 m. Dirty storm water run-off and bleed water collection facilities (dams) will be constructed on both sides of the paddocks.

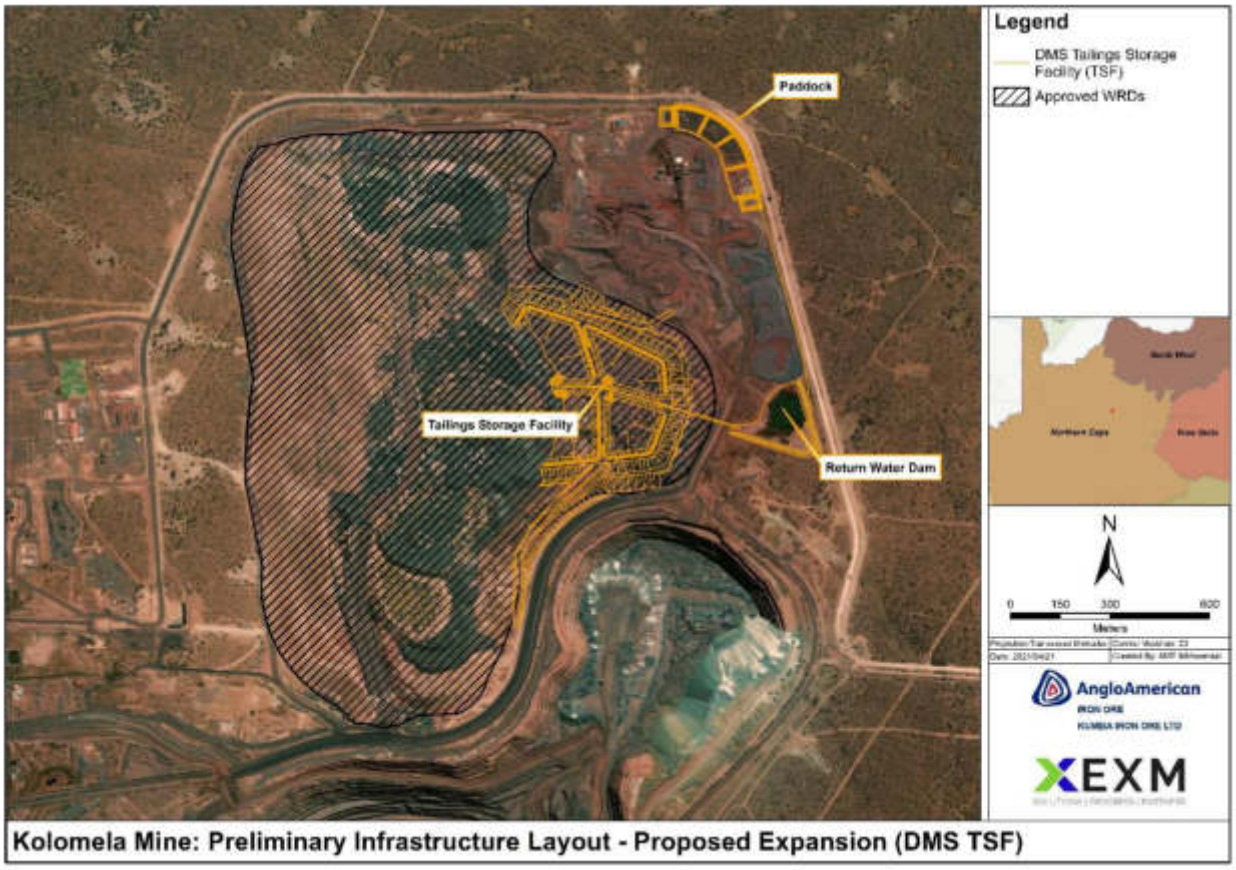


FIGURE 4-10: DMS TAILINGS MANAGEMENT INFRASTRUCTURE

Clean water will be diverted around the DMS plants by means of soil berms and drains. Dirty water run-off from the Kapstevel DMS plant area is to be collected in a pollution control dam (PCD). This system will comprise a sediment trap and oil separator as appropriate. The water from the PCD will be recycled back into the process. The stormwater system at the DMS plant will be upgraded, including the enlargement of the PCD. Dirty water run-off from the Klipbankfontein and Tierbult DMS Plant areas will be contained in evaporation dams (i.e. water will not be recycled for re-use). These dams will have a capacity approximately 14 200 m^3 and 15 267 m^3, respectively. Water management systems will be designed so as to accommodate a 1 in 50 year storm event.

4.3.12 Conveyor and Railway Line from Tierbult DMS Plant

Kolomela has identified the need to pursue a high grade product strategy, which means that the material from the Tierbult DMS Plant will no longer be deposited onto the DSO conveyors as this will blend the future higher grade and lower grade material. Two strategies (see Figure 4-12) have been identified to separate the low grade material from the high grade product.

4.3.12.1 DMS to DSO conveyor

Construct stockpiles (bunkers) to the north of the DSO plant with a conveyor from the DMS plant to the 4 stockpiles (Low grade and high grade lump and fine). These stockpiles would typically be reinforced earth bunkers with a central tunnel under the stockpiles fed by feeders, with the conveyor ending up on the load out conveyor.

4.3.12.2 DMS to DSO railway line

The second strategy will entail a new rail siding / spur from the main line, towards the DMS plant. This will entail a direct railway shipment of the material and will include a loading mechanism onto the rail trucks.

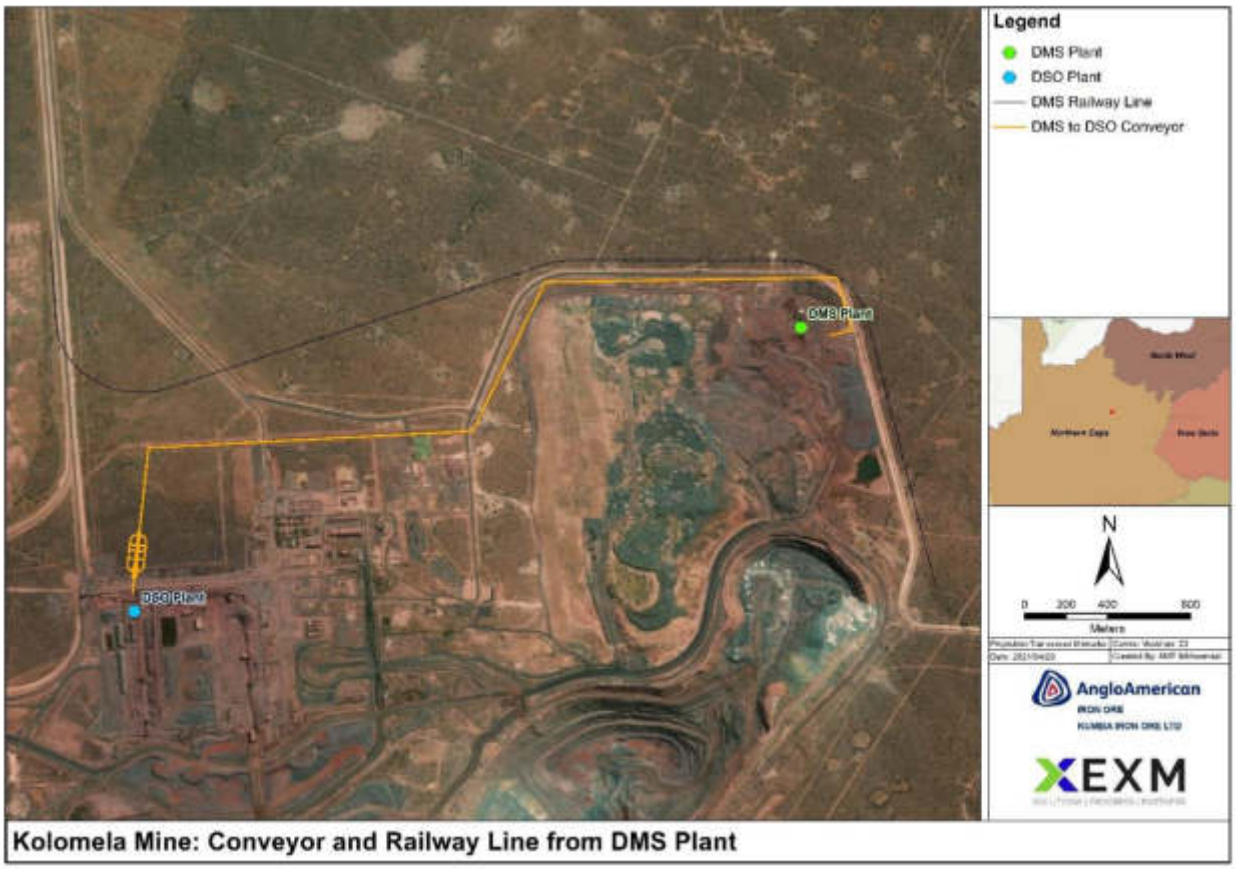


FIGURE 4-11: CONVEYOR AND RAILWAY LINE FROM DMS PLANT

4.3.13 Main Administration, Offices and Workshops

Supporting infrastructure was constructed as part of the Kolomela mine development, including offices (administrative and other support functions), security centre, on-boarding centre, parking for support staff and haul roads, workshops/laydown areas and warehouses. The mine support infrastructure covers approximately 90 hectares within the existing disturbed area.

A construction village was constructed as part of the Kolomela mine development. The buildings have been converted and is currently also used as offices.

Kolomela proposes to allocate an area west of Leeuwfontein North Pit for the use as additional contractor laydown areas (Figure 4-1 and 4-3). The area will cover approximately 13 hectares and will be situated on existing disturbed and approved footprints. No new listed activities are triggered.

4.3.14 At Pit Facilities

4.3.14.1 Kapstevel At Pit Facility

Kolomela is in the process of developing the Kapstevel At Pit Facility which will provide for

supporting infrastructure closer to the Kapstevel Pit area. The At Pit Facility includes a haul truck parking and fatigue area for accommodating off-shift workforce. Provision is also made for workshops for the maintenance of haul trucks, a washbay, a small sewage treatment plant (which will also service the future Kapstevel DMS Plant) and a refuelling area, including facilities for the storage of 1 million litres of diesel (1 000 m^3) and also petrol and lubricants.

Clean water will be diverted around the dirty areas and collected in a PCD which will comprise a sediment trap and oil separator as appropriate. The water will be recycled for re-use at the plant or workshop areas as required or used for dust suppression on roads. Clean water will be diverted around the facility using drains.

Kolomela proposes to expand the footprint of the At Pit facility slightly to accommodate stormwater infrastructure and fencing. The current approved footprint is 110 ha and will be amended by an additional 25 ha to allow for the additional infrastructure (Figure 5-9).

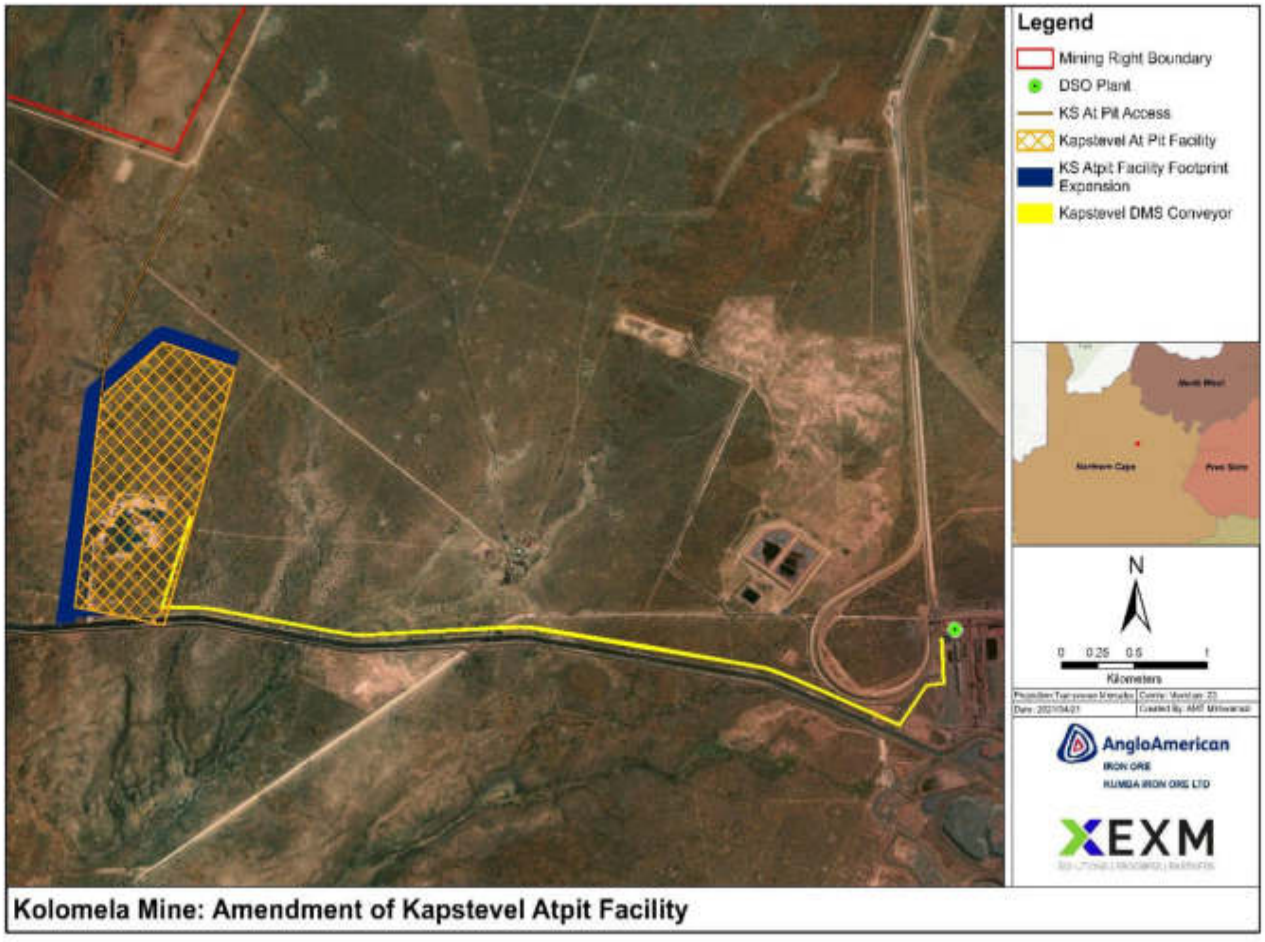


FIGURE 4-12: KAPSTEVEL AT PIT FACILITY AND DMS CONVEYOR

4.3.14.2 Kapstevel At Pit Access Road

An access road is required for construction vehicles travelling to the Kapstevel At Pit Facility which the negates the need for such vehicles to travel through mining areas at Kolomela mine. As indicated in Figure 4-14, the existing farm access roads to the north of the facility will be used and only a small section for the new road will be required. The road will be approximately 1.6 km in length and will be 30 m wide with a reserve of 20 meters. An area will also be developed on Aucampsrus as indicated in the Figure below for the parking of construction vehicle which will be less than a hectare in extent.

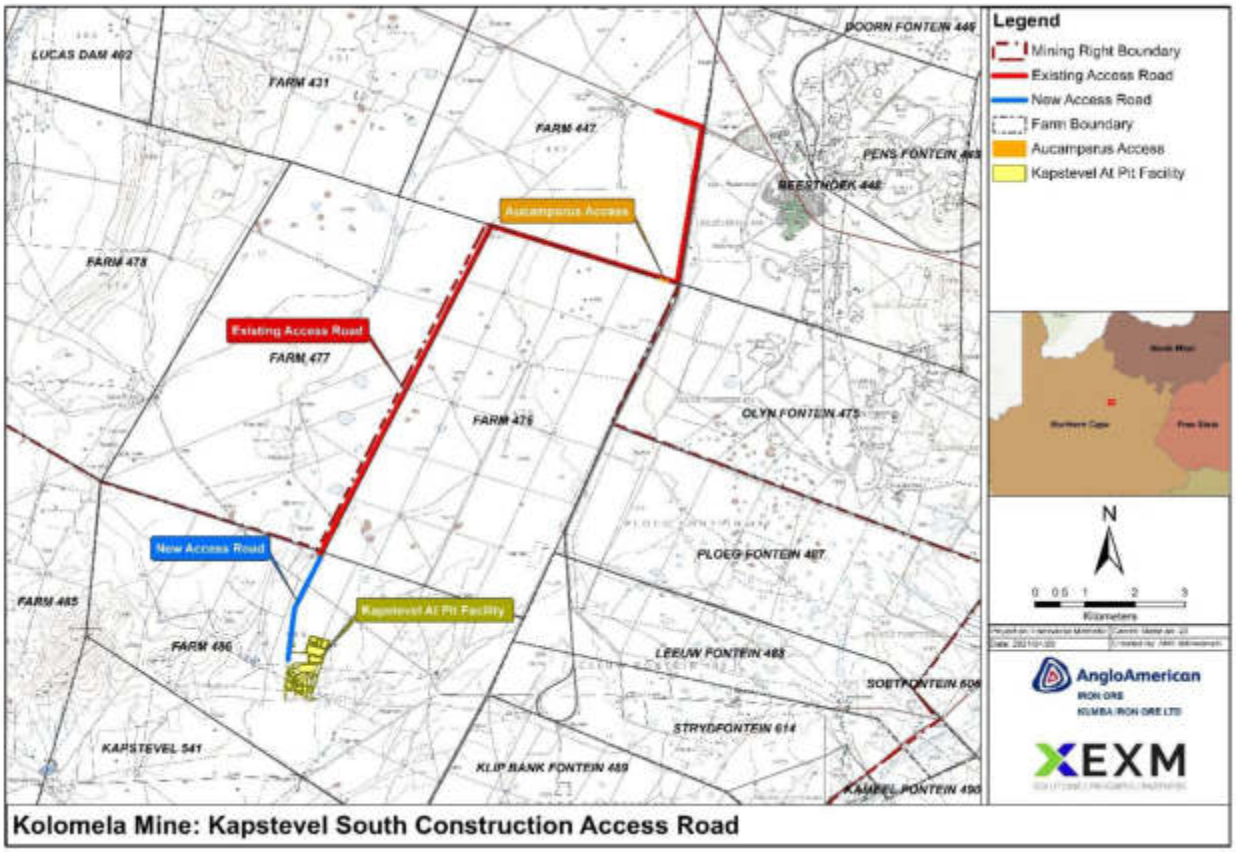


FIGURE 4-13: KAPSTEVEL AT PIT FACILITY ACCESS ROAD ROUTE

4.3.14.3 Klipbankfontein At Pit Facility

Kolomela is authorised to develop a future At Pit Facility close to the Klipbankfontein operations which will include a haul road, haul truck parking, a fatigue centre, workshops, wash bay and refuelling area. A conservancy tank will be used for the management of sewage at this facility. There will be two PCDs established to collect run-off, one from the haul truck parking area with a capacity of 105 885 m^3 and one from the workshop area with a capacity of 101 783 m^3. A parking area will also be developed adjacent to the Klipbankfontein At Pit facility which will

cover approximately 8 ha. There are no proposed changes to the approved infrastructure.

4.3.15 Water Export Pipeline and Pump Station

Kolomela has developed a pipeline of approximately 14 km in length for the conveyance of excess water (not used in the operations) that originates from the dewatering operations. The water is pumped to the Beeshoek Reservoir from where the water is conveyed via a pipeline to supplement the Vaal-Gamagara Water Scheme. There are no proposed changes to the export water pipeline infrastructure.

4.3.16 Railway Line to Beeshoek and Access Road

Kolomela has constructed a railway spur which includes a balloon at the loading section and a single electrified line linking to the Sishen-Saldanha export line. The total length of the railway spur is 14 km. A road was built parallel to the railway line which serves as the main access road to the mine and a second road was built which serves as the service access road for the rail line. The total width of the access road and railway line is approximately 100 m. There are no proposed changes to the railway and access road infrastructure.

4.3.17 Bulk Hydrocarbon Storage

Kolomela has developed a bulk fuel depot which has the combined capacity to store 2000 m^3 of fuel and 40 m^3 of lubricants (gear oil, degreaser, greases and coolants). Fuel is delivered to the Total Bulk Dispensing 3 km north of the fuel depot from where it is conveyed via aboveground pipelines to the fuel depot for storage. The bulk fuel depot has bunding in place with a capacity to capture 110% of the volume of the largest tank. A sump has been installed and the contents of the sump is piped to an oil separator located at the mine's wash bay. The recovered water is reused at the main vehicle wash bay area.

4.3.18 LDV and Loco Refuelling Areas

A locomotive refuelling facility is in place to refuel diesel locomotives at the railway spur. The facility has a total capacity to store 122 000 litres of diesel. Refuelling depots are in place to refuel light vehicles at various locations at the mine (multipurpose vehicles, cars and small machinery). There is a combined storage of 600 m^3 for both the locos and LDVs on site.

4.3.19 Explosives Magazine

Kolomela has developed an explosives magazine and is authorised to expand the facility. The total combined surface will cover approximately 13 hectares. The current planning shows that Kolomela will commence in the 2021 with the construction of the additional explosives magazine adjacent to the existing facility.

4.3.20 Perimeter Fence and Maintenance Road

Part of the development of Kolomela, a boundary fence and perimeter road was developed for access control. The fence and road are approximately 62 km long around the mining right area.

4.3.21 Artificial Aquifer Discharge Pipeline

Kolomela abstracts water as part of the mine's dewatering operations of which a portion is provided to the Vaal-Gamagara Water Scheme. However, the water abstracted exceeds the water requirements of the Water Scheme and has to be managed to prevent discharge into the environment. Kolomela is authorised to develop two separate pipelines and associated discharge boreholes, namely the Leeuwfontein (LF) and Kappies Karee (KK) pipelines. The LF project has been completed and the KK project is being developed. The LF pipeline is linked to 11 boreholes and the KK pipeline will be connected to 8 boreholes. There are no proposed changes to the aquifer recharge infrastructure.

4.3.22 Low Grade Stockpile Areas

Various smaller iron ore mines are located in relatively close proximity to Kolomela. A large portion of the ore extracted at these mines is of a low grade which requires specialised processes to optimally refine the material. The processing plants at Kolomela can process this lower grade ore into saleable product. However, insufficient stockpiling space prevents Kolomela from obtaining larger quantities of low grade ore from the surrounding mines. Three stockpile areas are thus proposed with a combined surface are of 33 hectares (Figure 4-15).

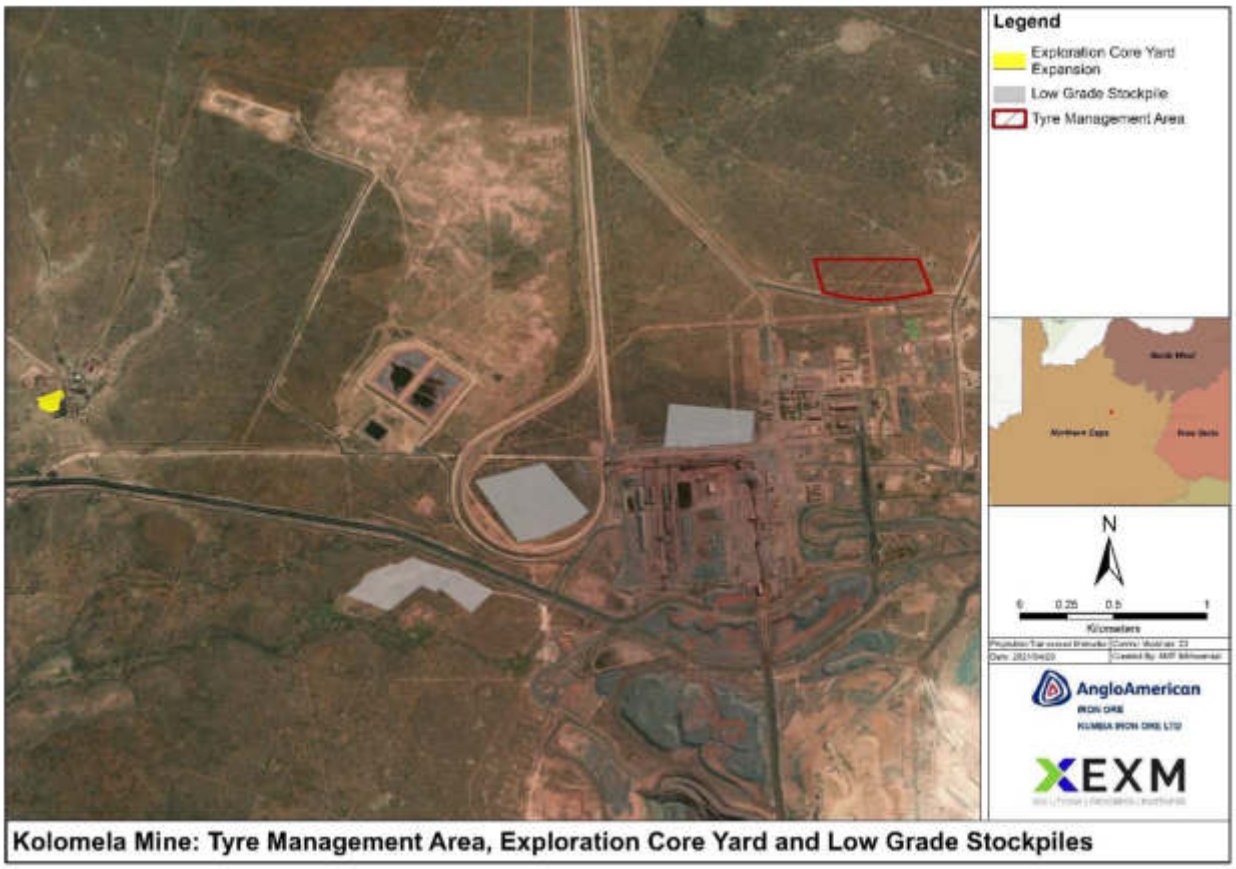


FIGURE 4-14: LOW GRADE ORE STOCKPILE AREAS AND TYRE MANAGEMENT FACILITY

4.3.23 Waste Tyre Management Facility

Kolomela proposes to develop a waste tyre manage facility to receive waste tyres produced by the operations. The development of a dedicated tyre management facility will form part of SIOC's overall waste tyre management strategy which will potentially involve a future pyrolysis plant. The waste tyre manage facility will cover approximately 10.2 ha. The facility will be utilised for the storage of tyres as well as downsizing (cutting and shredding) for further processing (recycling) off site.

4.3.24 Waste Management Facilities

A bioremediation facility is in place for the remediation of soils contaminated with hydrocarbons. The facility will not be amended. Kolomela also has a temporary hazardous waste storage and a recycling station. There is also no plan to amend these facilities.

4.3.25 Sewage Treatment Works

Kolomela mine is authorised to operate a sewage treatment works with a treatment capacity of 200 m^3/day with an expanded capacity of another 200 m^3/day which was authorised in 2017. The expansion of the sewage treatment works is being undertaken. The sewage treatment works

is a Beacon Watertech Bio-Filter Plant or equivalent. The purification process comprise of a primary combined settlement tank and anaerobic digester, secondary aerobic process, humus tank and a disinfection process. The quantity of treated water that will be released to the outflow pond depends on the actual usage of the sewage system but the maximum discharge that the system can handle is 200 kl/day.

Following treatment in the Bio-filter plant, all treated effluent will be pumped to a PCD where it will be re-used during for operational water (mainly for dust suppression and plant make-up) once the mine's processing plant is commissioned. Sewage sludge originating from the plant (20 m^3 per annum) will be taken to the municipal sewage works on an annual basis.

4.3.26 Exploration Sites

Kolomela is authorised to conduct exploration activities on the properties within the mining right area. Exploration activities will continue throughout the life of mine in order to ascertain the extent of the geological resources. Drill sites comprise a barricaded area of approximately 10 m x 15 m and the cumulative area covers more than 20 ha. Exploration takes place throughout the mining right area, so the activity is authorised to take place anywhere on the site.

Exploration involves the drilling of holes to access and investigate geological cores. Each drill site includes a drill rig, mobile drill sludge units, waste receptacles, soil stockpile area, mobile toilets, chemical and waste storage area with storage bins, an operator cabin. Plastic sheets are placed under these components. Concurrent rehabilitation is conducted according to a predetermined schedule which include the *in-situ* remediation of any residue, ripping of the sites, shaping (if required), and revegetation.

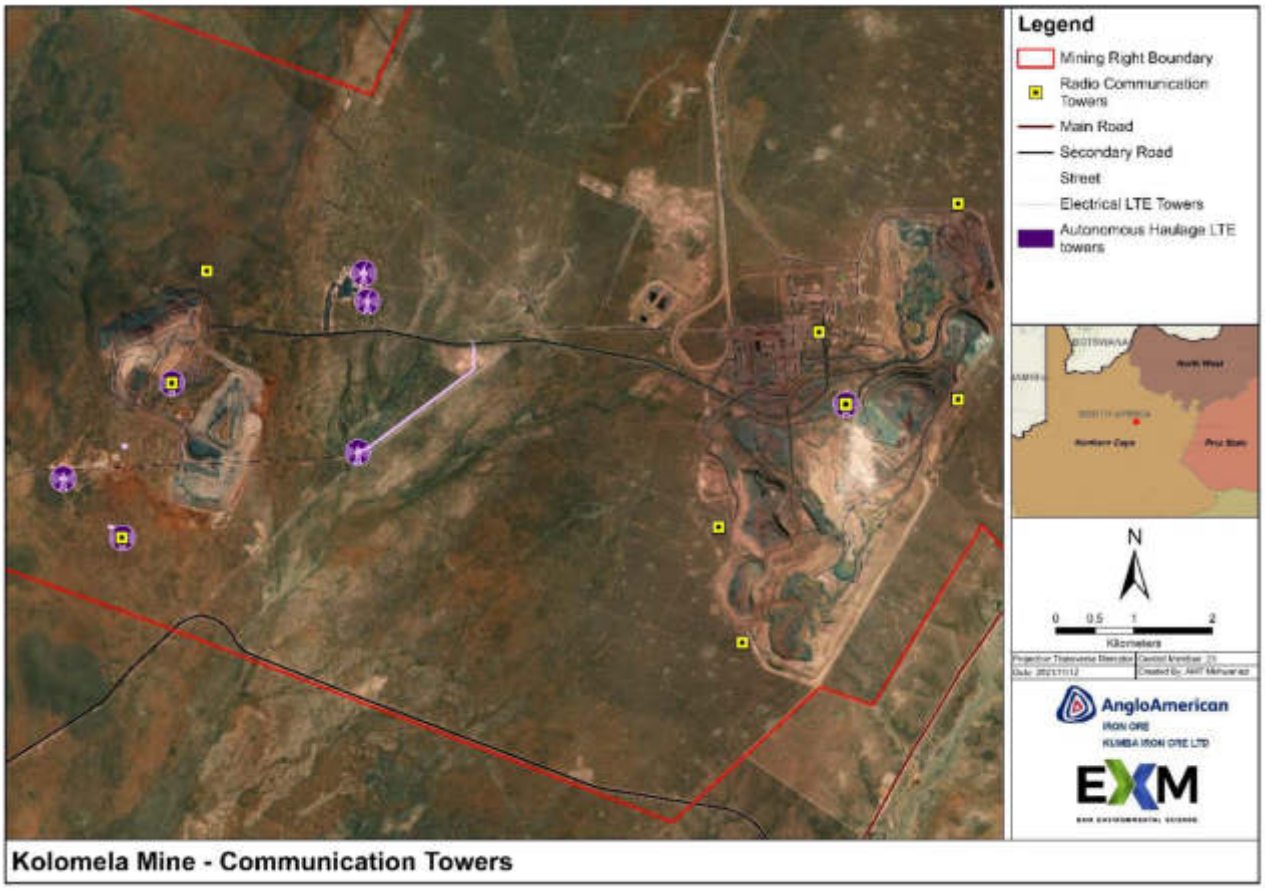
4.3.27 Exploration Core Yard Expansion

Exploration activities at Kolomela results in the production of geological cores which must be stored prior to processing. The current core yard does not have sufficient capacity to store the cores that are produced. Additional area of approximately 1 hectares is required and the yard will be developed adjacent to the existing facility on previously disturbed land.

4.3.28 Radio Masts

Kolomela has established communication towers within the mining right area. Kolomela has initiated a process to migrate their analogue communication systems to a digital radio technology to comply with the requirements of the Independent Communications Authority of South Africa. This will entail the establishment of additional communication/radio towers. The autonomous haul trucks will also require additional LTE towers to be installed at strategic

positions.



4.3.29 Photovoltaic Solar Facility

Kolomela proposes to establish a Photovoltaic (PV) Solar Facility to supplement the Eskom grid power supply. Generation of electricity at the PV Solar Facility will provide a reliable and cost-effective source of power, especially during periods of power interruptions/load shedding. The utilisation of solar energy will also decrease dependency on fossil fuel powered energy, lower Kolomela's carbon footprint and maximise energy savings.

The site identified for the solar facility is approximately 177 ha and was previously used as a borrow pit area. The PV Solar Facility development will thus only require additional vegetation clearance of 73 ha. The area features an undulating surface due to the uneven removal of soil, more severe excavations were undertaken where calcrete was less prevalent and more topsoil could be removed.

The area is therefore already disturbed. The proposed PV plant will have a maximum capacity of approximately 90 Mega Watts and the development of the facility will be phased, commencing with 17 Mega Watts of solar capacity which is in line with the Anglo American's strategy carbon emission reduction strategy.

There is no existing infrastructure on the site. Overhead power lines and a water pipeline run along the road on the western extent of the proposed site, while the railway line runs along the eastern boundary of the site. Please refer to figure below. Electricity supply at Kolomela mine is from the Postmasburg traction substation, the mine is however metered by Eskom at the Kumba 132/11 kV substation.

Infrastructure for the PV Solar Plant will include the following:

- Foundations for PV panel support structures.
- Stormwater canals.
- Fencing.
- Parking areas.
- Operations and maintenance building.
- Cabling and earthing.
- Integrated circuits and cable networks.
- Integration with the existing substation .

4.3.29.1 Water supply

The maximum water consumption during construction is estimated to be 2200m3/year and 700m3/year during operations and maintenance. Groundwater abstracted as part of dewatering will be used to supply water to the facility. Treated water from the bio-treatment plant can also be an option to supply water to the facility. It has been indicated that the total hardness of the groundwater at Kolomela is too high for the cleaning of the PV panels and may require treatment prior to use.

4.3.29.2 Access road

Existing access roads will be used to gain access to the PV plant therefore vehicles will not have to go through the main access gate. As indicated in Figure 4-15, the existing farm access roads to the north of the Kolomela will be used and a section of road (indicated in purple) will require upgrading, including widening. The width of the road (to be upgraded) is currently 6-8 meters and the total width will be 12 meters.

4.3.29.3 Cabling and integration with current network

A collector substation will be built on the PV facility that will be used to connect the cables from the different panels. From collector substation, a cable will be established to connect to the Kumba substation or a tie-in substation to feed the generated electricity. A few options are considered to connect the PV plant to the existing networks, including a direct connection to the Kolomela electrical network, or to connect to a new tie-in substation adjacent to the Eskom substation and from there it will tie in the Kolomela network as indicated in Figure 4-15. This substation will cover approximately 0.4 hectares on an undeveloped area. A collector substation will be built on the PV facility that will be used to connect the cables from the different panels. From collector substation, a cable will be established to connect to the Kumba substation to feed the generated electricity.

4.3.29.4 Geotechnical considerations

A desktop geotechnical investigation was undertaken to identify any potential risks for the PV facility. The study found that the site is underlain by dolomite but at depths greater than 100m and site is underlain by dolomite but at depths greater than 100m. No dolomitic risks were identified. No fatal flaws were identified for earth works (low risk), the foundation of PV panels or cabling and earthing.

4.3.29.5 Hydrology and stormwater management

The area is located on an old borrow pit where no backfilling has been undertaken. It is therefore lower than the surrounding areas. The design will have to make provision for stormwater road crossing either through the provision of pipe culverts or drift. No special earth works or terracing will be required for the PV area itself. The PV area is considered a clean area and runoff can be drained into the natural environment.

The stormwater system will consist of a clean water system to control runoff. Stormwater on site will be managed by a cut-off berm on the high end of the site and stormwater v-drains along all the service roads, channelling the stormwater to the outlet structures, on the low end of the site, where the water will be discharged into the natural environment. Energy dissipation will be achieved through the placement of rockfill or stone pitching to prevent erosion.

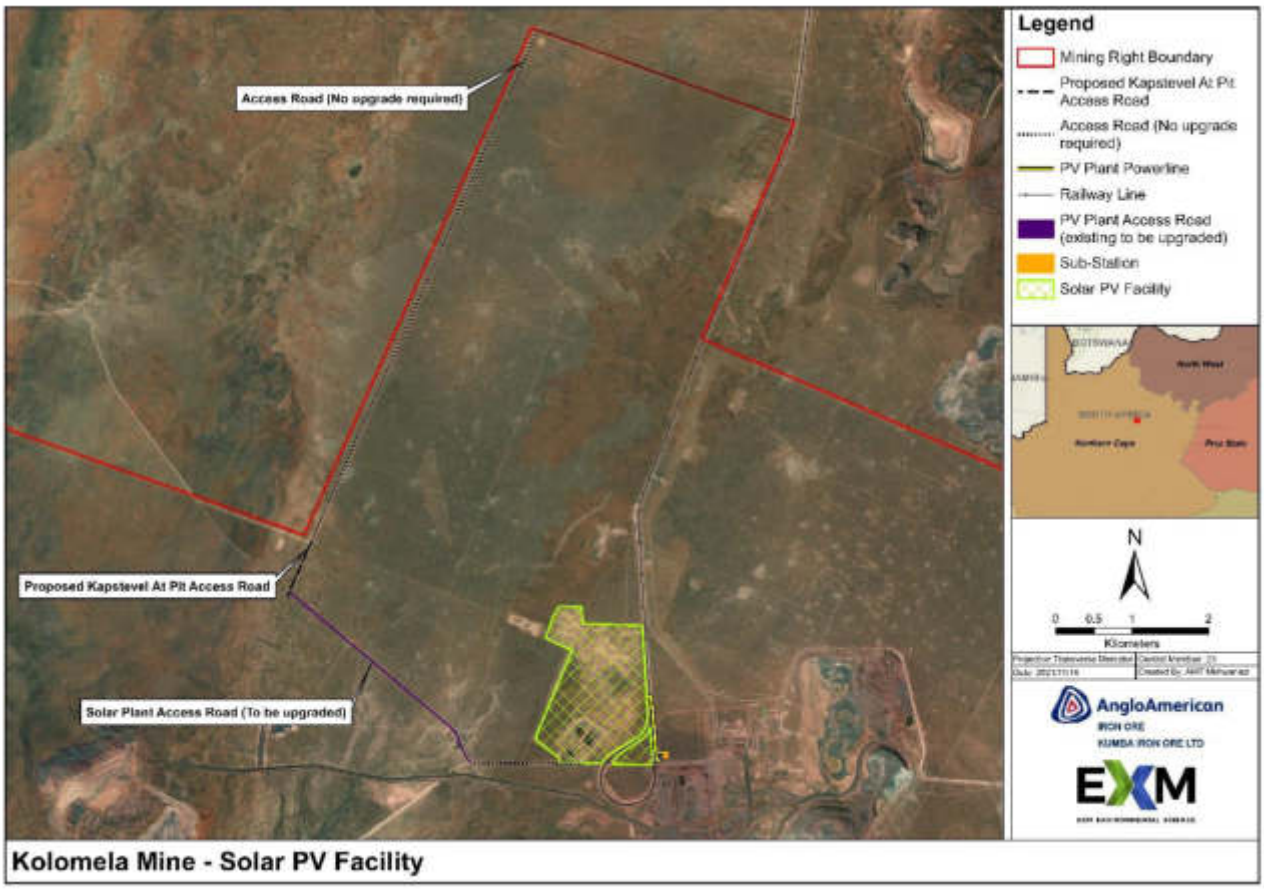


FIGURE 4-15: PV SOLAR PLANT LAYOUT

4.3.30 Mobile Crushers

The construction of the haul roads at Kapstevel will require building material. Kolomela will use mobile crushers as part of the construction process to crush larger material, including waste rock and plant discard, as well as other inert material to be used for construction purposes. The mobile crushers will be situated on the existing disturbed areas at Kapstevel and at the eastern section adjacent to the WRDs.

5. POLICY AND LEGISLATIVE CONTEXT

This document (EIR) has been developed strictly in accordance with the requirements of the National Environmental Management Act (NEMA) (No. 107 of 1998) and the EIA Regulations (GNR 326 of 2017). This section outlines the key legislative requirements applicable to the Kolomela Mine expansion project.

5.1 Mineral and Petroleum Resources Development Act (No. 28 of 2002)

The MPRDA regulates the requirements for a mining right in order to mine a mineral and undertake associated activities. Mining can either include removal of an underground mineral or mineral occurring in a residue deposit or residue stockpile. The Minister of Mineral Resources granted a mining right, for the mining of iron ore at Kolomela Mine on 5 May 2008, {Ref: (NC) 069 MR}. The mining right is valid until 17 September 2038, unless cancelled or suspended. The Environmental Management Programme (EMPr) (as amended in 2010) for Kolomela was approved as part of the mining right application and a subsequent EMPr was approved as part the 2017 expansion EIA process.

Section 102 of the MPRDA regulates the amendment of an EMPr due a change of activities related to a specific mining right. The proposed activities including the expansion of mining and association activities at are not included in the existing approved Kolomela EMPr or any amendment thereto. The EMPr thus requires amendment to include:

- A description of the additional/amendment activities to take place including;
- A description of the baseline environment to be affected by the expanded footprint areas;
- A description of additional impacts because of the expanded activities; and
- Identification of additional mitigation measures required.

SIOC has submitted an EMPr amendment application in terms of Section 102 of the MPRDA.

5.2 National Environmental Management Act (No. 107 of 1998)

Section 24 of NEMA provides for the Minister of Environmental Affairs to publish activities that require Environmental Authorisation (EA) prior to commencement. This has resulted in the promulgation of Listing Notices 1 (GN. 327), 2 (GN. 325) and 3 (GN. 324) with the Environmental Impact Assessment (EIA) Regulations (GN. 326) of 2017. Activities included in Listing Notices 1 and 3 require a Basic Impact Assessment to be undertaken and activities included in Listing Notices 2 require a scoping and full EIA process to be undertaken in order to obtain EA prior to commencement.

From the initial review, activities under Listing Notice 1, 2 and 3 are triggered and thus the application EA requires the completion of a scoping and EIA process.

Regulation 36 of the EIA Regulations relates to the amendment of an EMPr where an amendment to the impact management outcomes (or objectives) of an EMPr is required. The Kolomela EMPr will be amended with the existing and proposed activities as part of this application process. The EMPr amendment will also be subject to the relevant requirements, including public consultation.

Authorisation is being sought for activities applicable to the Kolomela Mine Expansion project in terms of the EIA Listing Notices 1, 2 & 3.

5.2.1 NEMA Financial Provision Regulation

Financial provision and its updates were previously regulated under the Mineral and Petroleum Resources Development Act (MPRDA) and its Regulations (GN R. 527 of 2004). In September 2014, all provision related to environmental management in the MPRDA was removed and included in section 24 of the National Environmental Management Act (No 107 of 1998) (NEMA). In November 2015, the Minister of Environmental Affairs promulgated regulations in terms of NEMA pertaining to the Financial Provisioning for Prospecting, Exploration, Mining or Production (NEMA Financial Provisioning Regulations).

Kolomela has developed closure reports (Final Closure, Annual Rehab and Risk Report) and has determined financial provisioning for the current infrastructure in terms of the NEMA Financial Provision Regulations. An annexure has been developed which covers the expansion activities.

5.3 National Environmental Management: Waste Act (No. 59 of 2008)

In terms of the National Environmental Management: Waste Act (NEM: WA) (No. 59 of 2008)), waste management activities that are listed in regulations published under NEM: WA may not be undertaken without a Waste Management License (WML). The listed activities for which a WML is required are contained in Government Notice (GN 921). Category A activities require a WML and a Basic Impact Assessment (BA) process must be conducted, and Category B activities require a WML and a full Scoping and EIA process must be conducted. In terms of Schedule 3 of NEM: WA, mining waste (residue stockpiles and deposits) are defined wastes falling under Category A – Hazardous Wastes of NEM: WA which includes waste rock.

The establishment of the new WRDs at Kapstevel and the development of the TSF on the Leeuwfontein WRD will trigger Activities 10 (*construction of a waste management activity*) and 11 (*residue stockpiles or residue deposits*) under Category B of GNR 921.

The project will require a Waste Management License in term of NEM: WA which forms part of this integrated environmental authorisation process.

Kolomela proposes to develop a waste tyre storage area of approximately 10.2 ha. An application to register the waste tyre storage area will be submitted in terms of Regulation 5 of the Waste Tyre Regulations (GN 12257 of 29 September 2017) and must be managed according to the requirements thereof.

The waste tyre storage area will require registration in terms of Waste Tyre Regulations prior to commencement.

5.4 National Environmental Management Act: Air quality Act (No. 39 of 2004)

The National Environmental Management: Air Quality Act (NEMA: AQA)(No. 39 of 2004) controls and regulates atmospheric emissions and provides for Listed Activities (GN. 893, November 2010) which have or may have a significant effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage. Any activity captured under this list require the person undertaking the activity to apply for an Atmospheric Emission Licence (AEL).

Kolomela Mine was issued an AEL on the 18th of March 2019 (NC/AEL/SIY/KOL1/2012). AEL was issued in terms of section 41(1)(a) of the NEM: AQA in respect of Listed Activity: Category 2: "*Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass subcategory*"; Sub-category 2.4: "*Storage and Handling of Petroleum Products.*". The AEL does not include the future storage of diesel at the Kapstevel At Pit facility and will therefore require a variation of the AEL which will be submitted to the Northern Cape Department of Environment and Nature Conservation. An updated Air Quality Impact Assessment is being undertaken as part of this application which will provide input to the variation application.

A variation of the Kolomela AEL will be required for the storage of diesel at the Kapstevel At Pit Facility and will be submitted prior to commencement of the storage activities.

5.4.1 National Dust Control Regulations (GN. 827 of 1 November 2013)

The purpose of the National Dust Control Regulations published in terms of the NEM: AQA is to prescribe general measures for the control and monitoring of dust fall in all areas. Kolomela has a dust management plan in place which provides measures undertaken by the mine to manage activities that may result in dust generation. Dust fall monitoring is conducted on a monthly basis at strategic location in respect of activities and sensitive receptors. The proposed

expansion activities will be incorporated in the current dust management and monitoring measures.

5.5 National Environmental Management: Biodiversity Act (No. 10 of 2004)

Section 57 of the National Environmental Management Biodiversity Act (NEMBA) (No. 10 of 2004) restricts certain activities involving threatened and protected species (as listed in Regulation GN. 151 and 152, February 2007) without a permit. Restricted activities applicable to the project are limited to the potential removal of Threatened or Protected Species (TOPS) and plants during the clearance of vegetation.

5.6 National Forests Act (No. 94 of 1998)

Sections 12 and 15 of the National Forests (No.94 of 1998) requires any person who damages, cuts, destroys, prunes or relocates a nationally protected tree (as listed in Regulation GN. 690, September 2017) to apply for a permit from the Department of Agriculture, Forestry and Fisheries (DAFF) to do so.

An application will be submitted for the removal of protected tree species within the application footprints.

5.7 Northern Cape Nature Conservation Act (No. 9 of 2009)

Section 49 and 50 of the Northern Cape Nature Conservation Act (No. 9 of 2009) requires any person that intends to undertake a restricted activity in respect of protected plants and animals as set out in Schedule I and Schedule II of the Act to apply for a permit from the Northern Cape Department of Environment and Nature Conservation. Application will need to be made for the necessary permits prior to the commencement of site clearance in areas where protected plants are present. The permit applications will be supported by an Ecological Impact Assessment specialist study.

An application will be submitted for the removal/disturbance of protected species if any such plants are identified during the Biodiversity Impact Assessment.

5.8 National Water Act (No. 36 of 1998)

The purpose of the National Water Act (NWA) (No. 36 of 1998) is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled. Section 21 of the NWA contains a list of activities that require a WUL prior to commencement. The Department of Water and Sanitation (DWS) issued Kolomela Mine with an Integrated Water Use License (IWUL) (License No. 10/D73A/ABCEGIJ/4125) that allows the mine to use water in terms of section

21(a); (b); (e); (g); (i) and (j) of the National Water Act, 1998 (Act No. 36 of 1998). The proposed amendment to authorised activities and new activities will trigger the Activities c&i and Activity g as summarised below.

TABLE 5-1: SECTION 21 WATER USES TO BE INCLUDED IN THE WULA

National Water Act Section 21 listed activities	Activities and infrastructure
Section 21 c&i	Crossing of watercourses (episodic drainage lines)
	Impacts on wetland pans or their catchment for the development of new infrastructure or amendment of existing infrastructure.
	Development of infrastructure within floodlines
Section 21 g	Disposal of waste rock material at new Waste Rock Dumps at Kapstevel;
	Storage of tailing at new paddocks at the DMS plant;
	Disposal of tailing at a new Tailing Storage Facility (TSF);
	Development of a new return water dam for the TSF

A WUL application process is being undertaken in terms of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR. 267 of 2017). An updated Integrated Water and Waste Management Plan (IWWMP) compiled in accordance with the requirements of GNR. 267 will be submitted in support of the application.

The project will require a Water Use License from the DWS Provincial Authority

5.9 National Heritage Resources Act (No. 25 of 1999)

The National Heritage Resources Act controls and regulates the interaction with heritage, archaeological, and paleontological artefacts and structures. Sections 34, 35 and 36 require that no person may demolish or alter any structure which is older than 60 years without a permit issued by the relevant provincial heritage resources agency. The NHRA further requires any person that disturbs any archaeological site, paleontological site or grave cannot do so without a permit.

An updated Heritage and Impact Assessment has been undertaken to identify any heritage sites within the expansion project footprint area. Should any site need to be altered or

destroyed, a permit will need to be obtained in terms of the NHRA. The South African Heritage Resources Council (SAHRA) will be consulted in terms of Section 38 of the Act. A Palaeontological Assessment has been conducted for the entire Kolomela and the study will be updated to reflect proposed expansion activities.

6. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES

According to the Guideline on Need and Desirability in term of the Environmental Impact Assessment (EIA) Regulations, 2010 (GN. 891 of 2014), the consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the proposed amendment along with the broad societal needs and the public interest.

6.1 Socio-economic contribution of Kolomela

Since Kolomela mine's arrival in 2008 (the start of construction), there have been notable changes in socio-economic indicators for the Tsantsabane area, and rapid expansion of the local economy. Kolomela mine's arrival, with a mining boom in the area created hundreds of job opportunities and other benefits for the local community. This, together with other developments in the area has resulted in a significant influx of job seekers into the area. The rapid population growth through in-migration resulted in informal settlements growing and severe pressure on the local municipality's ability to provide basic services and maintain bulk infrastructure.

Socio-economic impact studies for Kolomela mine documented the socio-economic changes over the years. If the results are only studied on the surface, the results can easily give the impression of no improvement in the quality of life of communities and deteriorating socio-economic indicators. But, when investigating conditions in demographic subsets and ring-fenced areas, improvements in education levels, income and employment are notable. However, municipal service delivery is still deteriorating. The in-migration of unemployed job seekers with low education and skills levels is also masking the socio-economic improvements in Tsantsabane over the past 12 years.

Kolomela mine has been the anchor of these improvements as the biggest employer and investor in community development and municipal support. The mine has built strong and robust relationships with political and community leaders and other stakeholders in Tsantsabane. Regular perception surveys found high levels of trust and strong relationships between Kolomela and stakeholders, time and time again, despite not always agreeing on everything and having had some protests and conflict along the way.

It is estimated that approximately 14,581 of the 42,608 residents of the Tsantsabane area are currently dependent on Kolomela mine for their livelihoods in one way or another – whether through direct, indirect or induced employment. The number translates to 34% of the population depending on Kolomela mine for their livelihoods. As much 31% of employed adults in Tsantsabane work for Kolomela mine, with a further 21% employed by Kolomela contractors. More than half of the employed individuals in Tsantsabane support their families

by means of income generated from Kolomela, either directly or indirectly.

It paints a positive picture of Kolomela mine's socio-economic impact in Tsantsabane, but at the same time it also raises concern in terms of the community's dependency on the mine and what will happen when Kolomela mine stops operating in about 13 years' time. There is a lot of work to be done to ensure the current level of over-dependency on Kolomela mine is addressed in time, to avert a humanitarian catastrophe when the mine close its doors one day. It will take time and careful planning, as well as partnerships with government, civil society and other private sector role players to create alternative economic opportunities and address dependency in time.

The ongoing operations at Kolomela mine must be evaluated against the background of high unemployment and poverty in Tsantsabane, and communities' strong dependency on, and expectations of, Kolomela mine to address the socio-economic as well as service delivery issues in the area. Socio-economic benefits from Kolomela mine have to be maximised for the community for as long as possible, not only to improve the living conditions and quality of life of communities, but also to extend the timeframe to prepare stakeholders for mine closure.

Developments at Kolomela mine have been planned to create significant socio-economic benefits for the Tsantsabane community, especially by means of employment, business opportunities, training and skills development. These potential positive impacts would in some instances offset some of the potential negative impacts, e.g. short-term employment of contractor employees, who will receive training and work experience that will be beneficial for future job applications.

Comparing the scenarios of Tsantsabane with or without Kolomela mine, it is like chalk and cheese. Without Kolomela there will be serious social and human rights impacts and risks that Kolomela mine will have to manage and will be blamed for, and held accountable for, by government and other stakeholders. With continued operations at Kolomela, there are significant benefits for the community, with a limited number of potentially negative impacts and risks of which most already form part of Kolomela mine's social performance and risk management interventions.

The maximisation of the life and operations at Kolomela mine is beneficial as there is a need to address the current dependency of the community on the mine and to work with other stakeholders to prepare for mine closure.

Renewable energy has become a viable and economical source of electricity generation and represents a sustainable alternative to fossil fuels. In addition to being an inexpensive source of electricity, solar energy developments participate to the reduction of air

pollution and to the mitigation of climate change while contributing to industrial development and job creation. The transition to clean, sustainable and safe energy use is important for South Africa which is one of the top 20 largest emitters of greenhouse gases in the world and the largest in Africa. The South African Government's commitment to roll-out renewable energy development is evolving through the Integrated Resource Plan (IRP2010) and the Renewable Energy Independent Power Producer Procurement Programme (REI4P). As stated by the Department of Energy, solar energy is the most readily accessible resource in South Africa and one of the highest in the world.

Generation of electricity at the PV solar facility will provide a reliable and cost effective source of power, especially during periods of power interruptions. The utilisation of solar energy will also decrease dependency on fossil fuel powered energy and lower Kolomela's carbon footprint.

7. MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT

(The determination of the site layout taking into consideration the comparison of the original site plan with a plan which takes (1) environmental features; (2) current land uses, (3) issues raised by IAPs and (4) consideration of alternatives, to the initial layout into account.)

7.1 Site location alternatives

The site on which the future infrastructure will be established is dependent on the existing Kolomela infrastructure layout, no site alternatives have therefore been assessed other than for the TSF and PV Solar Facility.

7.1.1 Tailings Storage Facility

Kolomela proposes to develop a TSF on the footprint of the existing Leeuwfontein WRD (Alternative 1) for the disposal of slimes from the DMS plant. Alternative 1 will not entail the removal of indigenous vegetation and the existing evaporation dam will be upgraded to use as a Return Water Dam (RWD). The facility is located in close proximity to the DMS plant and will not require the establishment of long distance slimes pipelines.

Three other alternative site locations (as indicated un Figure 7-1) have been identified for the establishment of the TSF. Alternative 2 entails the expansion of the existing Kolomela TSF to the northern section. Apart from the development of the pipeline, this alternative will not entail the disturbance of undeveloped areas and no vegetation will be disturbed. The existing RWD can be used. It has been established that this option will incur significant financial implications

due to the establishment of infrastructure for the conveyance of slimes. The location of this alternative is also earmarked for the development of the PV solar facility.

Alternatives 3 and 4 entail the establishment of a TSF east and south east of the DMS plant, respectively. These alternative locations are situated in close proximity to the DMS plant and will not require investment for new, long distance pipelines. However, the footprints are situated in an area not previously disturbed and will entail the removal of indigenous vegetation. Wetland pans will also be affected by the footprint of these alternative sites. Alternative 4 is situated in the footprint of a future pit (Tierbult) and is therefore not feasible. A new RWD for each of these alternatives will be required. Alternatives 3 and 4 are not desirable in terms of environmental impacts and feasibility, and is therefore not favourable.

To conclude, Alternative 1 (establishment of a TSF on the existing WRD) is the preferred option from an environmental, strategic and financial perspective.

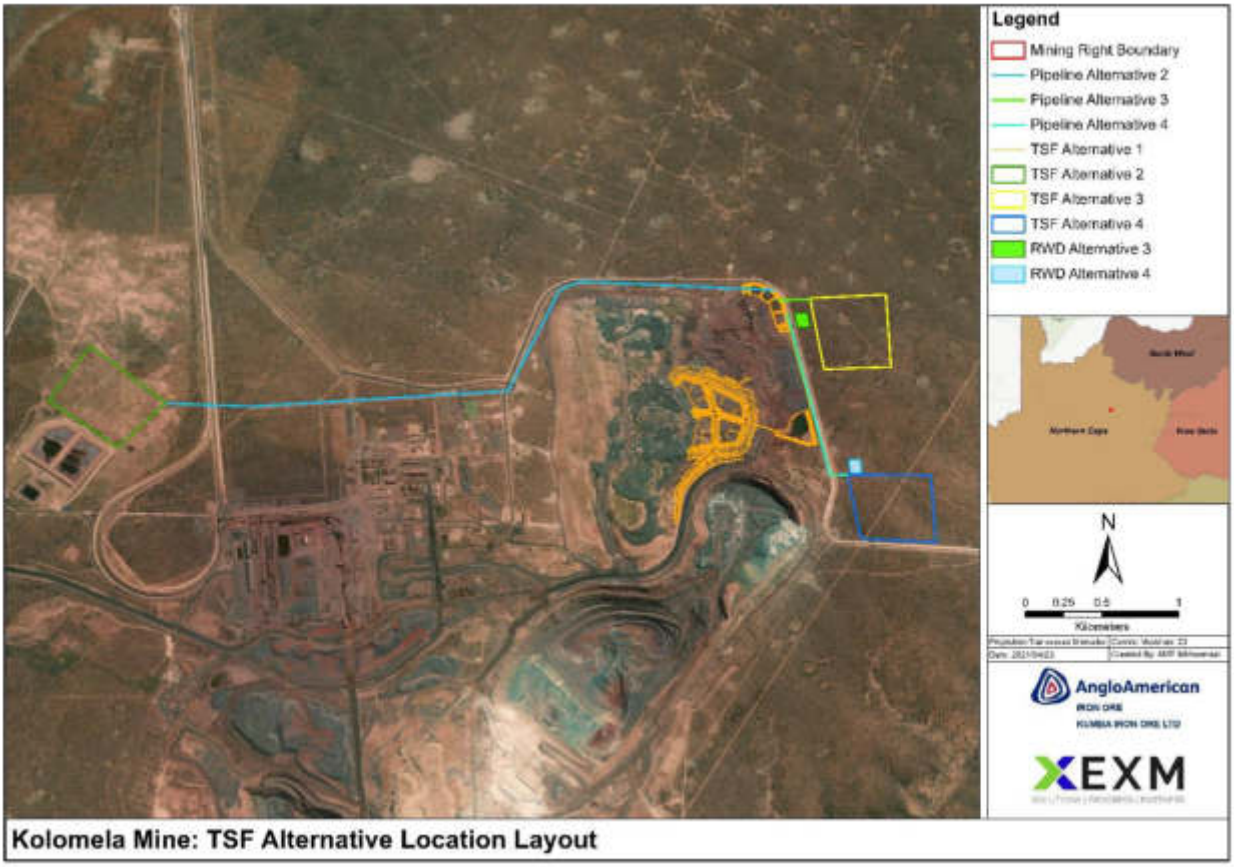


FIGURE 7-1: TSF ALTERNATIVE SITE LOCATIONS

7.1.2 Solar Plant

Site location alternatives were identified for the development of the PV solar plant as indicated in the Figure 7-2. Alternative 1 is located mostly on the existing disturbed footprint of a historical borrow pit. The PV Solar Facility will cover a total footprint of approximately 227 ha

on of which most of the area have been previously disturbed and will only require vegetation clearance of 72,7 ha. Alternative 1 is also located close the Kolomela substation which will prevent long distance transmission lines. This alternative is located outside the 100m regulated zone of any water course.

Alternative 2 is located to the west of Alternative 1 and will cover approximately 238 ha. A large portion of the site is located within a CBA and the Soutloop River (a NFEPA river) and delineated episodic drainage line will be impacted. The entire footprint area is currently undisturbed and will require the removal of indigenous vegetation and potentially protected plant species. The site is also located further from the substation and will require longer distance transmission cables. This option is not favourable as it will result in severe environmental impacts and cost implications.

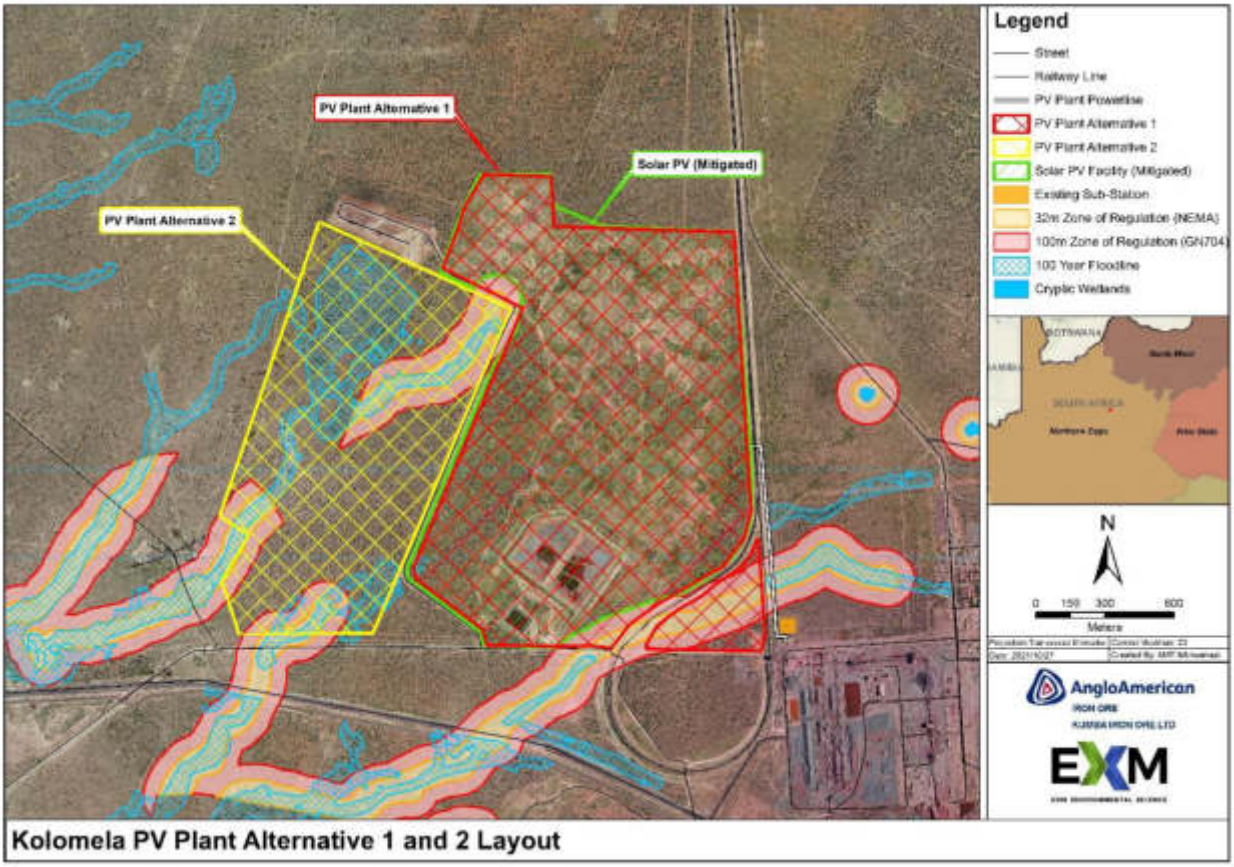


FIGURE 7-2: PV SOLAR PLANT SITE LOCATION ALTERNATIVES

7.2 Technology Alternative

Kolomela currently implements technology associated with the DSO facility which includes primary, secondary and tertiary crushers for the processing of ore prior to shipment via a rail system. Kolomela also utilises a DMS Processing Plant for the processing of low grade ore not suitable for processing at the DSO plant. No alternative technology have been assessed as part of this application.

7.3 The Type of Activity to be Undertaken

The type of activity for the Kolomela Expansion project is iron ore mining. This is the activity currently undertaken at the site and this activity will not change as a result of the amendment. Therefore, different activity alternatives were not considered at the site, as there is only one activity option for the expansion of Kolomela mine, and that is to continue with the activity of iron ore mining.

7.4 Site Layout Alternatives

7.4.1 Kapstevel Waste Rock Dump layout alternatives

Site layout alternatives were assessed for the WRDs at Kapstevel. The original unmitigated layout alternative for the south eastern Kapstevel WRD encroached on the "Welgevondenspruit" and associated episodic drainage line which is a tributary of the Soutloop River and designated NFEPA wetland as well as other drainage lines. The footprint also extended across two ridges that have been identified as sensitive areas due to the prevalence of habitat to support species of conservation importance.

The footprint was amended and will not extend across the Witsand road towards the NFEPA wetland and sensitive area to the east. A 50 m buffer was created around the sensitive area to the north and the WRD footprint was amended accordingly. The footprint of the south eastern WRD was reduced by approximately 44 ha to avoid the sensitivities. An additional area of 23 ha have been added to the northern section of the eastern WRD to compensate for the large area excluded. This area is not characterised by water courses or sensitive areas.

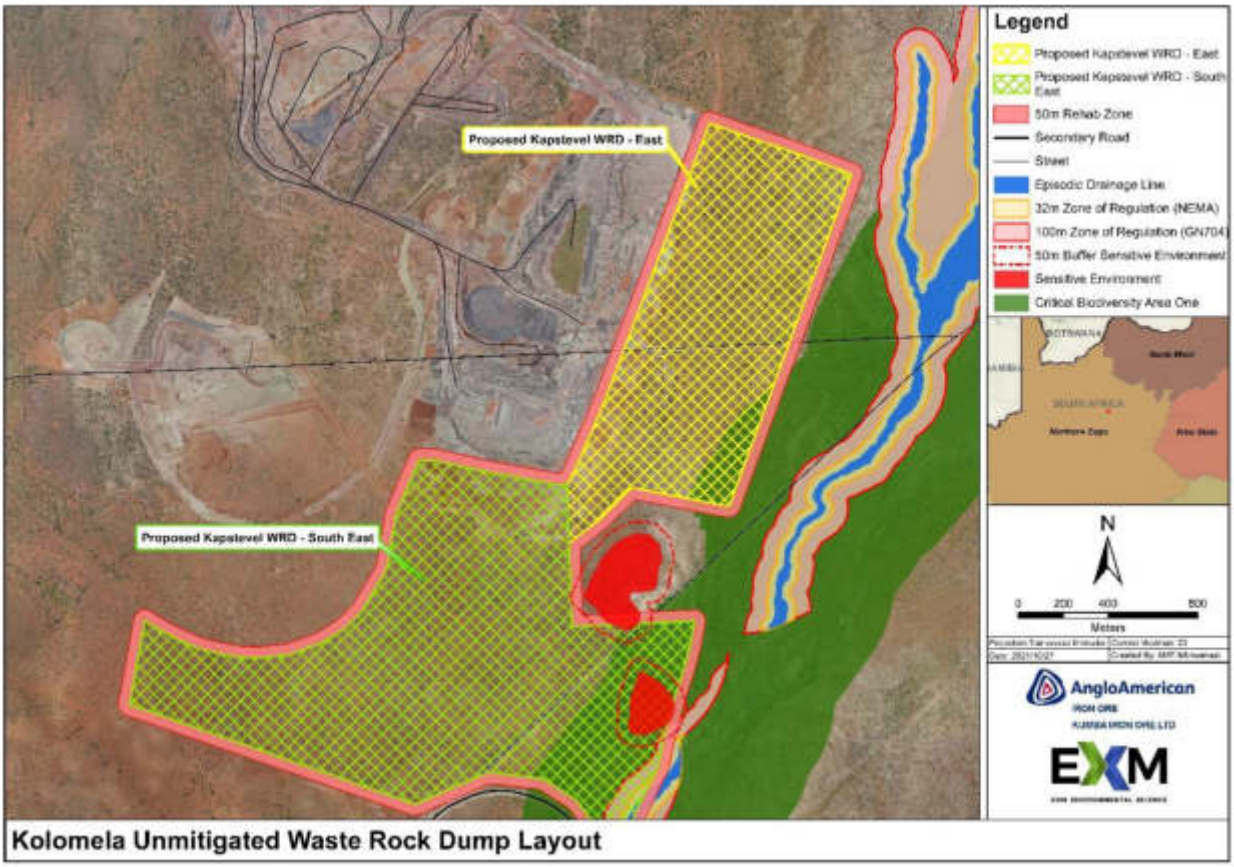


FIGURE 7-3: UNMITIGATED WASTE ROCK DUMP LAYOUT

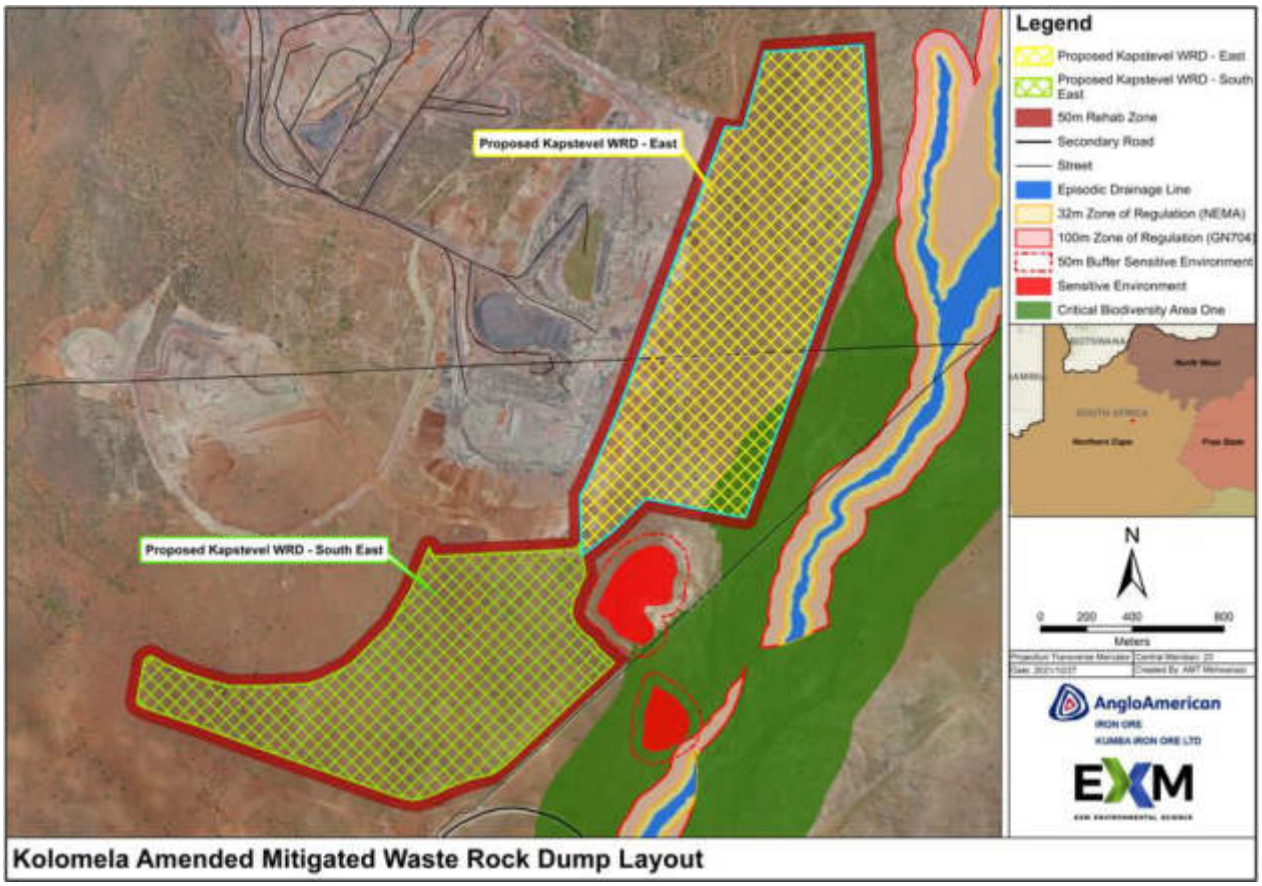


FIGURE 7-4: MITIGATED WASTE ROCK DUMP LAYOUT

7.4.2 Haul roads layout alternatives

Layout alternatives for the haul roads were considered as indicated in the Figure 9-5. The original unmitigated layout would extend to the south. This would encroach a large section of the "Welgevondenspruit" and associated episodic drainage line and the CBA 1 and cause significant disturbance in these areas. The layout was amended to cross only a small section of the Welgevonden spruit where disturbance have already occurred. The mitigated layout will minimise impacts on a NFEPA and the CBA 1. The layout of the road will further be assessed and amended during the EIA phase according to the outcome of the specialist studies.

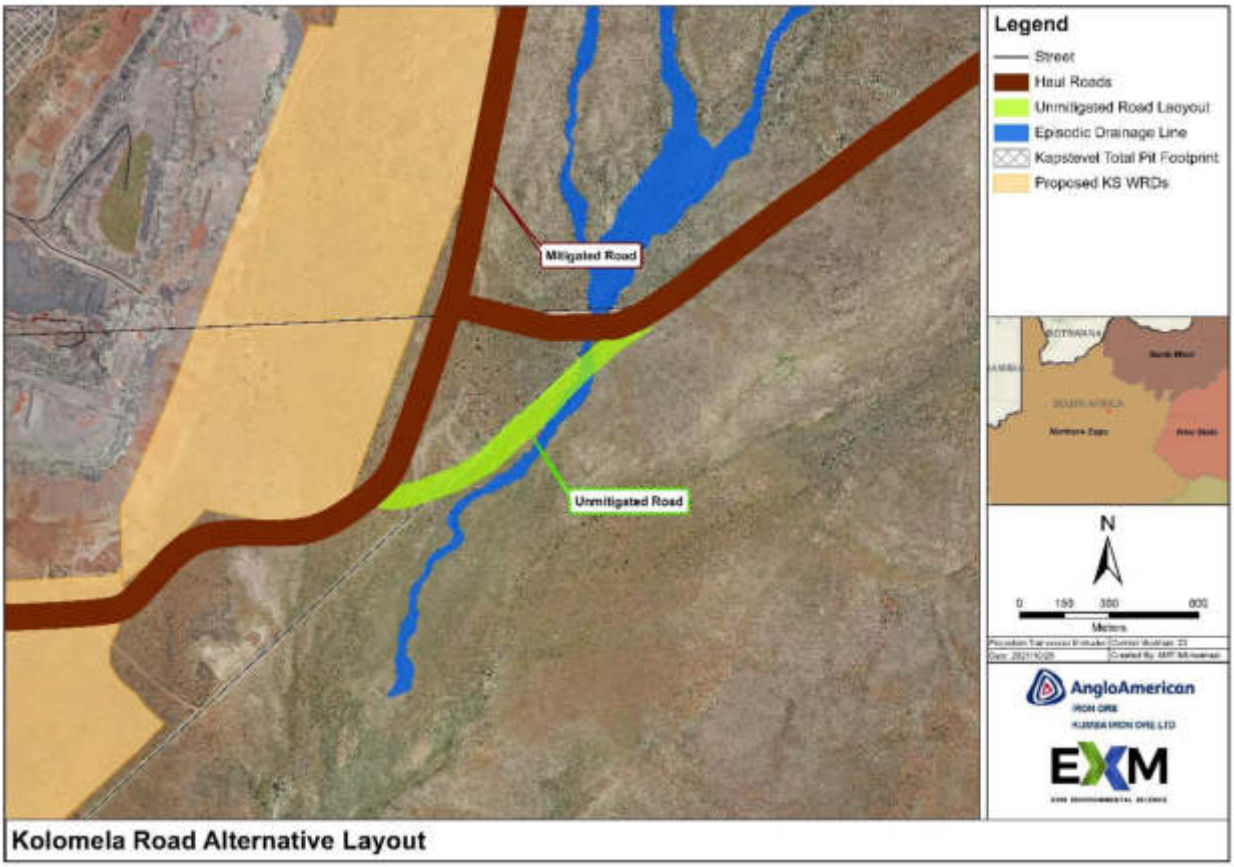


FIGURE 7-5: ALTERNATIVE HAUL ROAD LAYOUT

7.4.3 Alternative Routes for the DSO to DMS Conveyor

Two alternative layouts have been considered for the conveyor from the DSO to the DMS plant as indicated in Figure 7-6. Alternative 1 will entail the disturbance of vegetation to the north and then follow the existing disturbed footprint to the east. This option will be the most feasible and practicable alternative as the route will not run through the operational area where infrastructure is situated. However, Alternative 1 will cross an episodic drainage line. Alternative 2 will entail the establishment of the conveyor through the operational area to the east of the DSO plant. Although no new vegetation clearance on unauthorised footprints will be required, this option will transverse 2 cryptic wetlands and will be very costly and not practicable to implement. It will result in significant operational obstacles and increased safety concerns. Therefore Alternative 1 is deemed the preferred alternative.

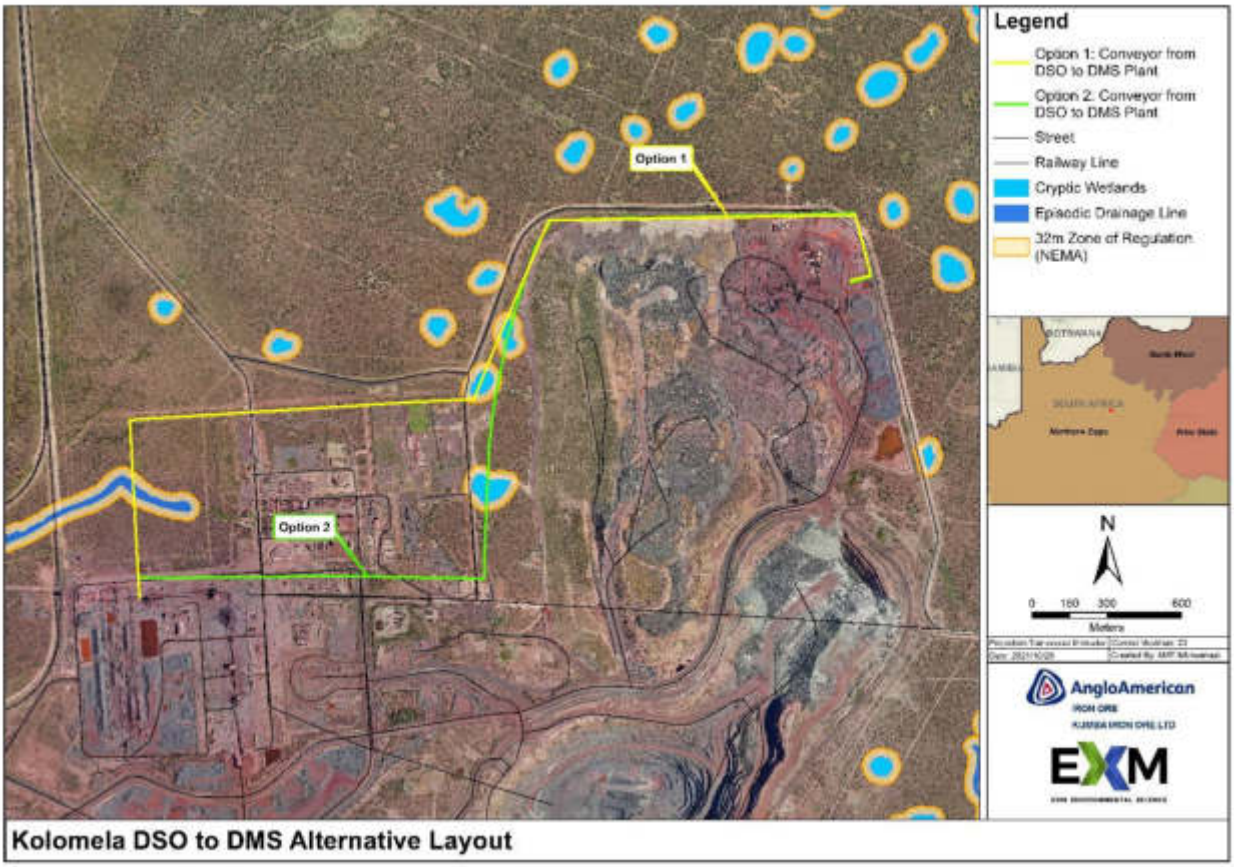


FIGURE 7-6: ALTERNATIVE ROUTES FOR THE DSO TO DMS CONVEYOR

7.4.4 Alternative Low Grade Stockpile Layout

The original layout of the low grade stockpiles has been amended to be located outside the 100m regulated zone from the from the episodic drainage line as per Figure 9-7 to minimise potential impacts.

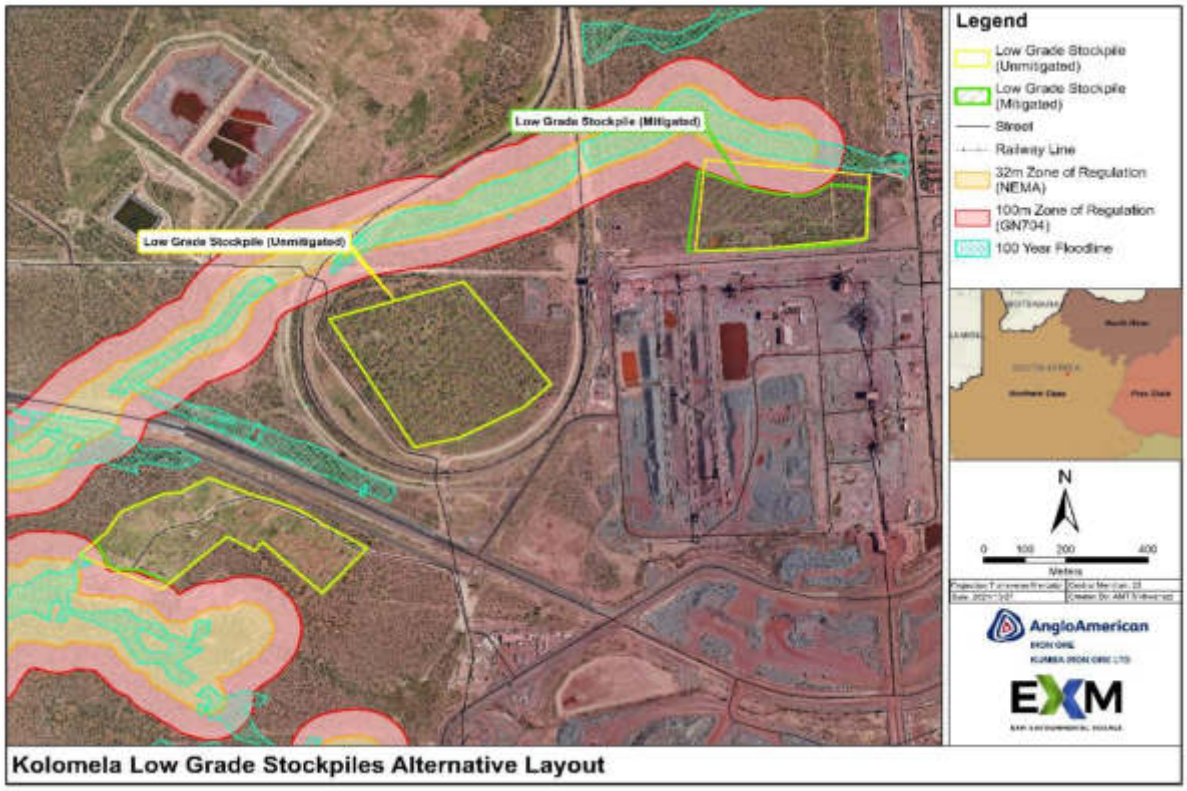


FIGURE 7-7: ALTERNATIVE LOW GRADE STOCKPILE LAYOUT

7.4.5 Alternative Tyre Management Facility Layout

The footprint of the tyre management facility has been amended to be located outside the 32m buffer from all cryptic wetlands as per Figure 7-8 to minimise potential impacts.

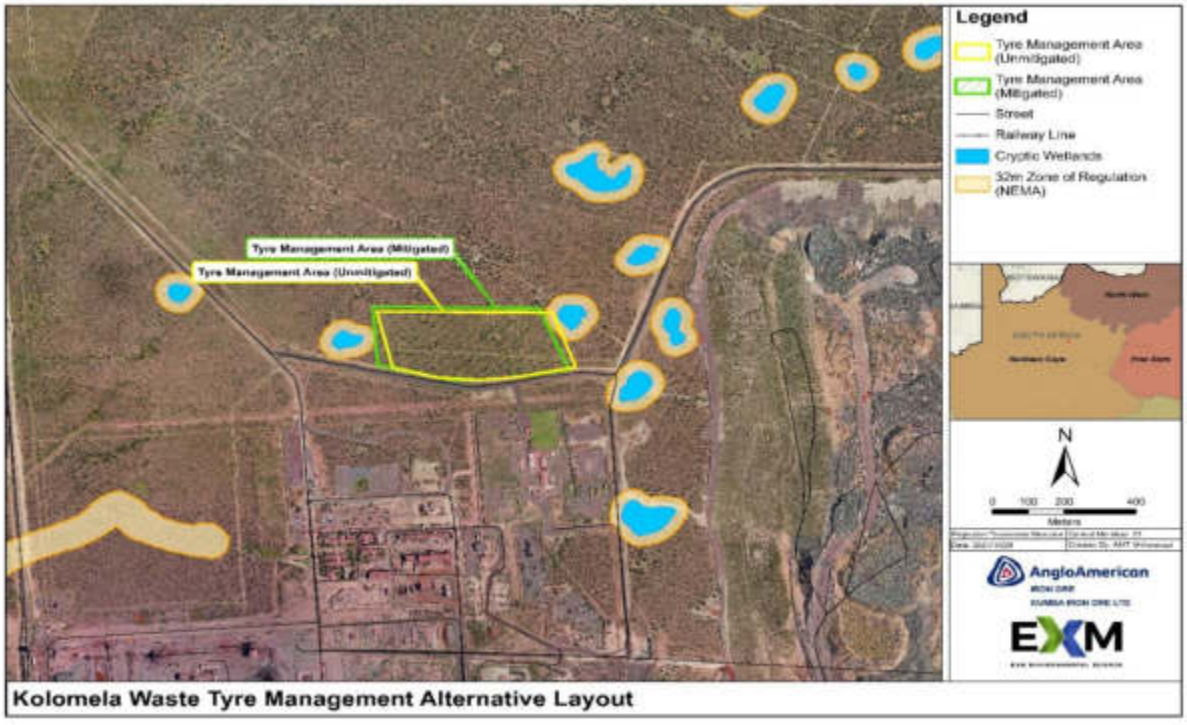


FIGURE 7-8: ALTERNATIVE TYRE MANAGEMENT FACILITY LAYOUT

7.4.6 Alternative Route for DMS Railway Spur

The alignment of the DMS railway spur has been amended to be located outside the 32m NEMA buffer from all cryptic wetlands as per Figure 7-9 to minimise potential impacts.

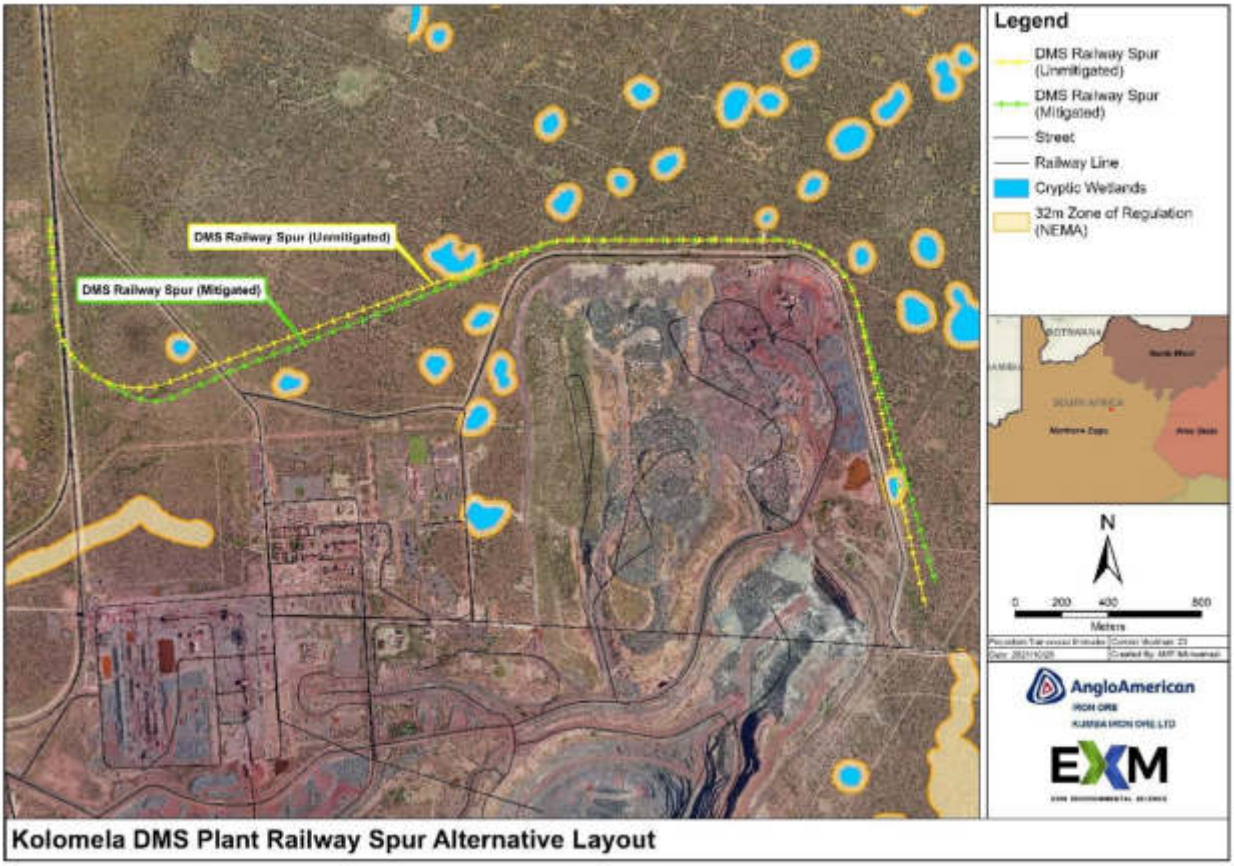


FIGURE 7-9: ALTERNATIVE ROUTE FOR DMS RAILWAY SPUR

7.4.7 Alternative Layout for the Expansion of the Exploration Core Yard

The expansion of the exploration core yard footprint has been amended to be outside the 32m NEMA buffer from the episodic drainage line (Welgevonden Spruit) as per Figure 7-10 below to minimise potential impacts. It should be noted that the footprint is located in an areas previously disturbed.

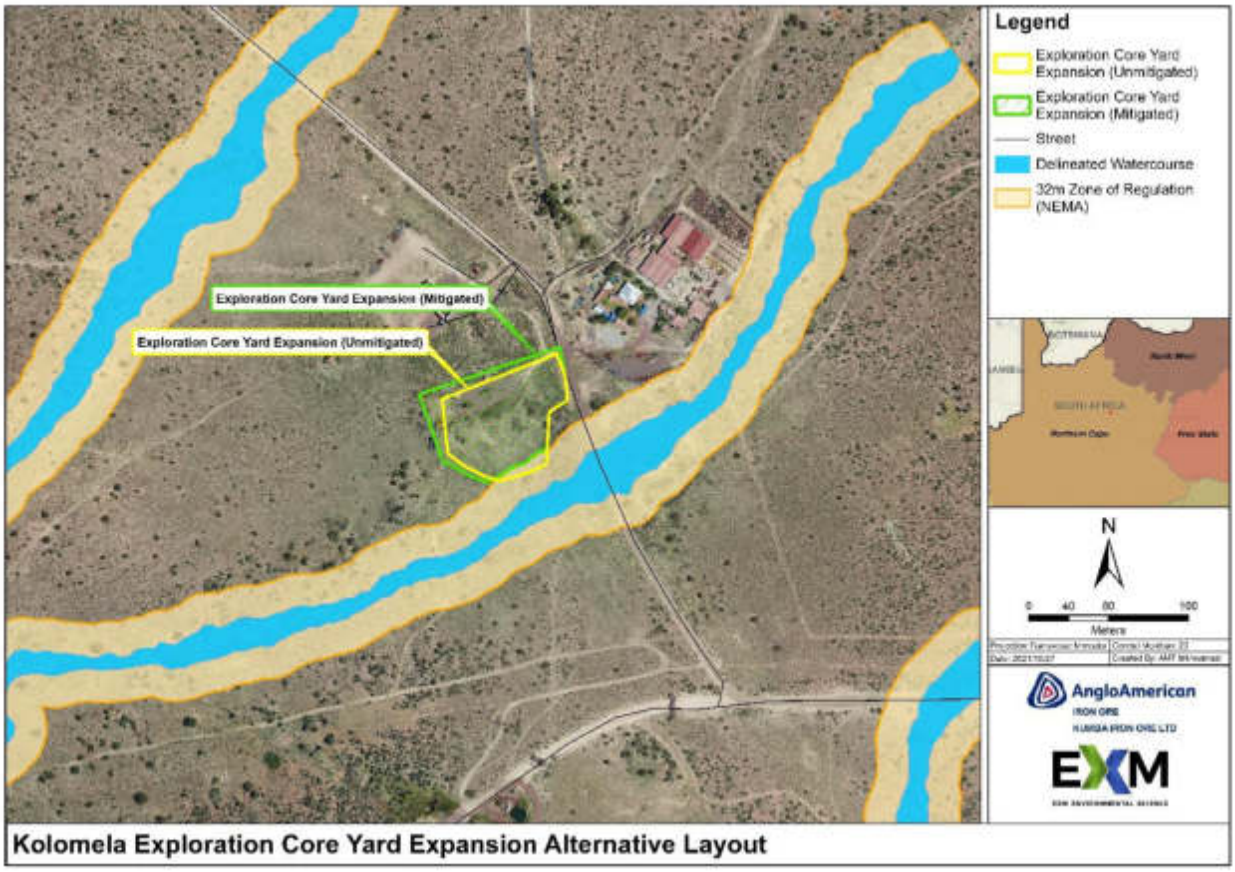


FIGURE 7-10: ALTERNATIVE LAYOUT FOR THE EXPANSION OF THE EXPLORATION CORE YARD

7.4.8 Alternative Layout for the Solar Facility

The original layout of the Solar PV facility has been amended to be located outside the 100m regulated zone from the delineated cryptic wetlands as per Figure 7-11.

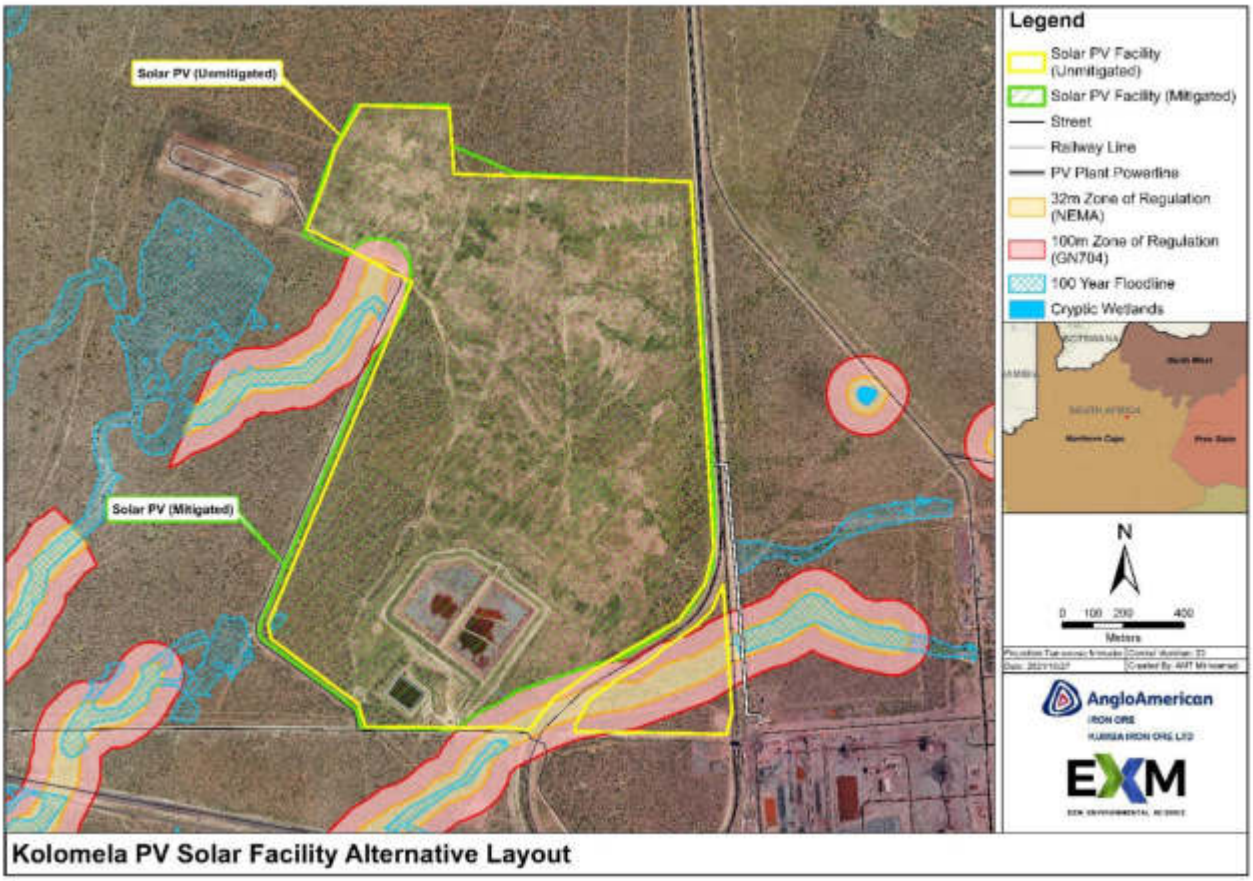


FIGURE 7-11: ALTERNATIVE LAYOUT FOR THE SOLAR FACILITY

7.4.9 Final alternative layout

Based on the above assessment, the Figure 7-12 shows the mitigated layout for the all the infrastructure evaluated and discussed above.

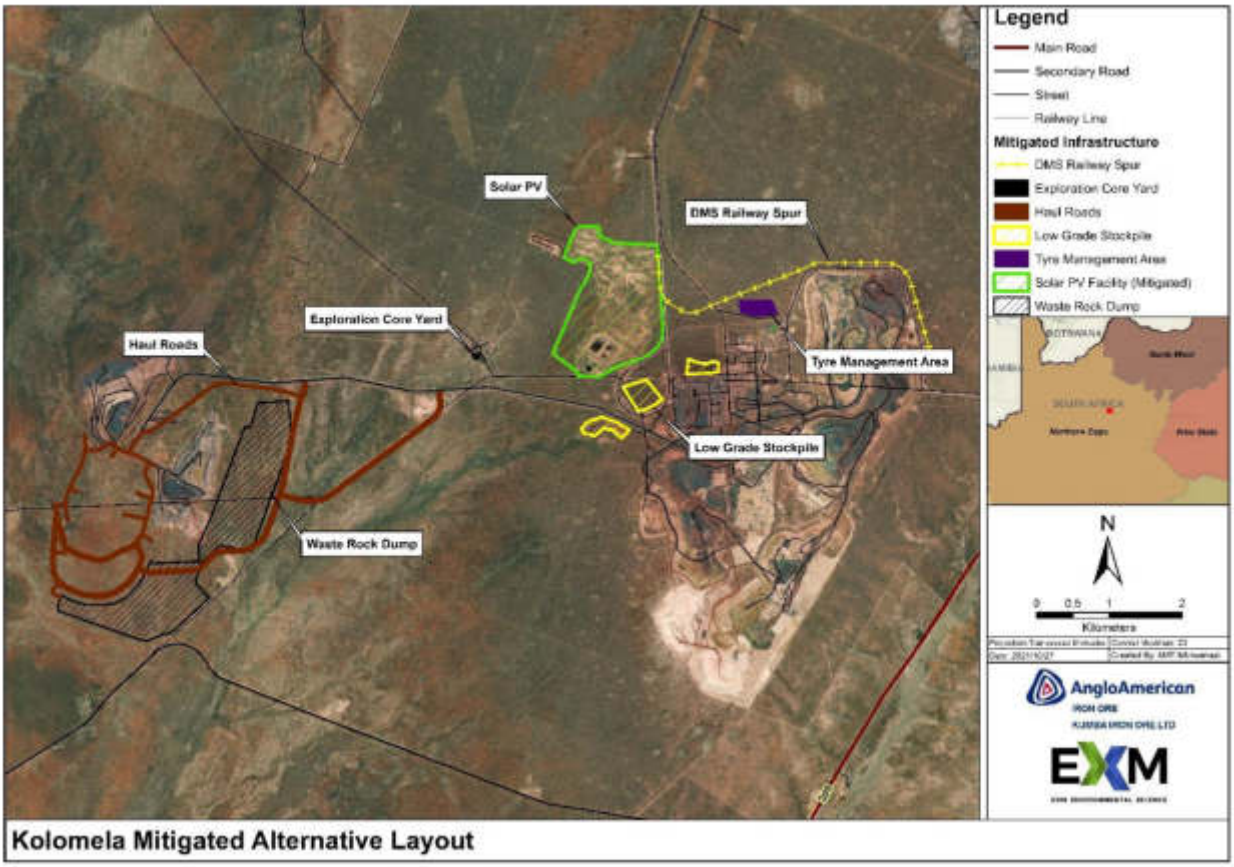


FIGURE 7-12: FINAL MITIGATED LAYOUT

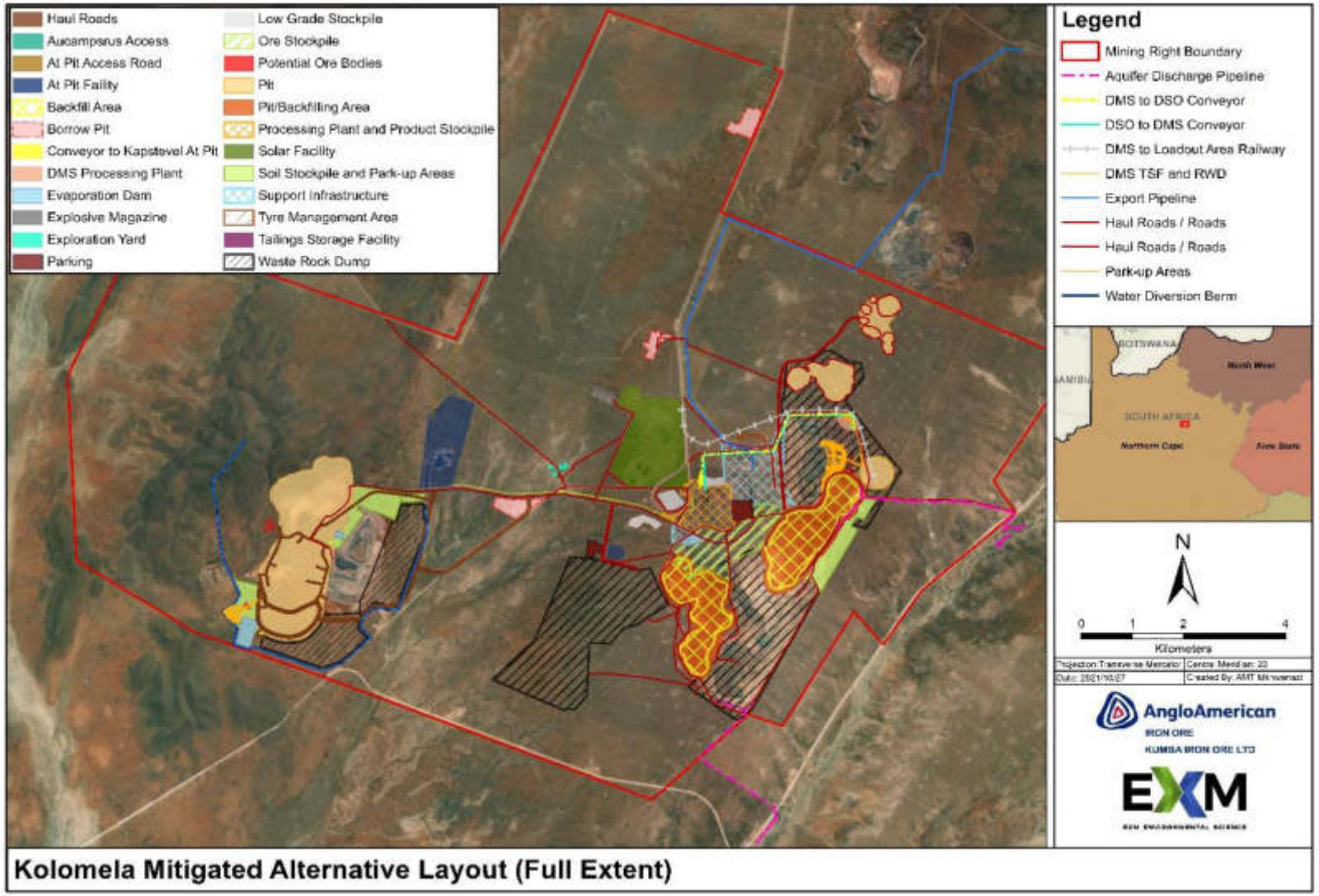


FIGURE 7-13: FINAL MITIGATED LAYOUT - ALL INFRASTRUCTURE INCLUDED

7.5 The Operational Aspects of the Activity

7.5.1 Management of slimes from DMS plant

The below alternatives are considered for the management of slimes from the DMS and will be included in the EIA for further assessment based on the outcome of the specialist studies.

7.5.1.1 Alternative 1: Co-disposal of slimes and waste rock

Slimes currently produced at the DMS plant are temporarily stored and conditioned prior to blending with waste rock prior to final disposal at the Leeuwfontein WRD. As previously mentioned Kolomela intends to prioritise backfilling into the pits and the mine proposes to commence with the backfilling of the blended material (waste rock and slimes). This alternative will entail the development of new slimes conveyance pipelines on disturbed areas and will not require the development of a new TSF.

7.5.1.2 Alternative 2: Development of a TSF on the Leeuwfontein TSF

The development of a TSF on the Leeuwfontein WRD which will replace the need for co-disposal of slimes and waste rock. It will entail the development of a TSF, the conversion of the existing evaporation pond to a RWD and the establishment of paddocks at the DMS plant. No natural vegetation will be disturbed.

7.5.1.3 Alternative 3: Development of a TSF combined with co-disposal of slimes and waste rock

Co-disposal, either via backfilling or on a WRD, of waste rock and tailings material will be conducted in conjunction with the development of the TSF to allow for sufficient capacity. This will be the preferred alternative which will allow for the development of the TSF, but also ensure that sufficient capacity is available for the handling of the tailings.

7.6 Option of Not Implementing the Activity

In accordance with the NEMA Regulations, the no-go alternative is required to be investigated and assessed. The no-go alternative would entail the non-continuation of the proposed expansion project. This would mean that Kolomela will not be able to conduct essential supporting functions for the mine, especially for the Kapstevel South project which holds significant socio-economic benefits. The *status quo* will remain and the no-go alternative would prevent any potential negative environmental impacts associated with the proposed expansion project, including the disturbance of surface water resources, removal of vegetation and associated biodiversity impacts, potential contribution to dust and noise generation, soil erosion, etc. The actual biophysical impacts will be investigated as part of EIA phase of the project and appropriate mitigation will be proposed.

8. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

A public participation process is conducted in terms of the Chapter 6 of NEMA and the EIA regulations. The purpose of the public participation process is to inform all the identified Interested and Affected Parties (IAPs) of the proposed development and associated EA application process and allow them to raise comments/concerns. The following provides a summary of the engagement that is conducted.

8.1 Identification of Interested and Affected Parties

Existing IAP databases were updated for the purposes of this project. Potential IAPs were identified based on the definition in the EIA regulations. This includes:

- Landowners or tenants adjacent to or within 100 m from the proposed study area. For the purposes of this study all neighbouring landowners have been identified and notified.
- Tsantsabane Rate Payers Association
- Representatives of the local municipality/ward councillor with jurisdiction in the area.

  This definition was expanded for the purposes of the assessment to include the mayor, councillors of the local council as well as members of the district municipality. This included representatives of:

  - Tsantsabane Local Municipality
  - ZF Mgcawu District Municipality

- Authority or organs of state having jurisdiction in respect of any aspect of the activity, including. The following organs of state have been notified:

  - Department of Water and Sanitation (Northern Cape)
  - Northern Cape Department Agriculture Land Reform And Rural Development (Northern Cape)
  - Department of Agriculture, Forestry and Fisheries (Northern Cape)
  - Department of Mineral Resources (Northern Cape)
  - Department of Environment and Nature Conservation (Northern Cape)
  - Department of Economic Development and Tourism (Northern Cape)
  - Department of Roads and Public Works (Northern Cape)
  - Department of Social Development (Northern Cape)
  - South African Heritage Resources Agency
  - Northern Cape Department: Co-operative Governance, Human Settlements and Traditional Affairs
  - Civil Aviation Authority

- Northern Cape Department of Agriculture
- Persons who respond to the Background Information Document (BID), press advertisements and site posters.

A list of all parties that have been identified thus far is included as **Annexure B1**

8.2 Notification of Interested and Affected Parties

In accordance with Section 41(2)(b) of Chapter 6 of the EIA Regulations (GN. 982 of 4 December 2014, as amended), written notification (including BID document) was provided to all persons on the IAP database.

- 8 site notices (Afrikaans and English) have been placed at the access roads and main gate to the site as well as at public areas (super spar and pick and pay) in Postmasburg (**proof of placement is attached as Annexure B2**)
- Email notifications have been sent to the identified I&APs (**proof is attached as Annexure B3**)
- SMS notification have been sent to the identified I&APs (**proof is attached as Annexure B4**)
- Advertisements have been placed in two newspapers (local and regional), one in English and one in Afrikaans which are distributed in the Postmasburg area (Noordkaap Bulletin and the Kathu Gazette) (**proof is attached as Annexure B5**)

A copy of the BID (Afrikaans and English) provided in **Annexure B6.**

8.3 Distribution of draft Scoping report for comment:

The Scoping Report was distributed for a period of 30 days to the identified IAPs by means of the following methods:

- An electronic link has been provided to the identified IAPs with access to email. Two platforms will be used including OneDrive and Dropbox to ensure access.
- Other IAPs for whom only cell phone number are available have been notified of the availability of the reports and provided the opportunity to request access to the documents.
- A hard copy of the Scoping Report was placed at the Postmasburg Public Library.
- A hard copy was provided to the competent authority.

Proof of distribution is attached as Annexure B7.

8.4 Public meeting

A public meeting will be conducted as part of the EIA phase. Proof will be included in the final Environmental Impact Report (EIR).

8.5 Comments and responses

Correspondence received is included in **Annexure B8.**

8.6 Summary of issues raised by IAPs

Correspondence received is included in **Annexure B7 and Annexure B9.**

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
Municipality (district and local)			
22 June 2021	H G Mathobela	Good evening Can you please send the above report to Tsantsabane Municipality at mmsec@tsantsabane.gov.za Regards H G Mathobela Sent from my iPhone	The scoping report was sent to the email address as per the correspondence. No further comments were received.
Interested Parties			
12 May 2021	Tanja Jooste M2H Mining Solutions	Good afternoon Trevor, Please find attached hereto our request to be registered as an IAP in the abovementioned matter. Question regarding the 'Initial Conceptual Layout' Plan on Page 4 of the Background Information Document: The legend refers to '19. Aucampsrus Access Area'. 1. Where exactly is this area (as I am unable to find it on the layout plan); and 2. What is the purpose of this area? Looking forward to receive your response. Kind regards Tanja Jooste	Good afternoon Tanja, Please find attached the area you are referring to. The extent will be shown in the scoping report which will be provided to all parties for comment. The area is less than a hectare and will be used during the construction phase to park vehicles and store material. Please inform me if you have any other questions. Kind regards Trevor

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
12 May 2021	Mimi Swart Rate Payers Association	Ontvang. Na bestudering volg kommentaar/vrae. Translate: Received. Will provide comments after review of the report.	Noted. No further comments were received.
21 July 2021	Chrystal Vries Assmang Beeshoek Mine	5.3.14 Water Export Pipeline and Pump Station Kolomela has developed a pipeline of approximately 14 km in length for the conveyance of excess water (not used in the operations) that originates from the dewatering operations. The water is pumped to the Beeshoek Reservoir from where the water is conveyed via a pipeline to supplement the Vaal-Gamagara Water Scheme. There are no proposed changes to the export water pipeline infrastructure. The water mentioned above is pumped to a reservoir managed by Sedibeng and not Beeshoek Mine. Beeshoek Mine taps water from the Sedibeng Reservoir, as result Sedibeng as on numerous occasions stopped the water feed to Beeshoek to cater for water needs downstream. This negatively impacts Beeshoek Mine's plant supply, resulting in production down time and financial losses. Sedibeng justifies the stoppage of the water feed to the Mine by stating that Beeshoek Mine takes more water than what is allocated to us.	Good morning Chrystal, Thank you for the communication received. The comment has been captured and communicated. It will be addressed as part of the process with input from Kolomela. Kind regards Trevor The comment will be addressed and incorporated in the impact assessment phase of the EIA, as well as part of the WUL application.

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
		Beeshoek Mine has a written agreement with Kolomela since 2012 which states that they will provide us with 320m3/h of water to compensate for water losses sustained on the southern mining area due to Kolomela Mine dewatering. Beeshoek Mine stays well within the allocated volume. Beeshoek Mine would like this agreement to be maintained and solidified in the Kolomela WUL. Beeshoek Mine in return will also note the agreement in their incoming WUL amendment.	
21 May 2021	Morne van der Merwe Northern Cape Chamber of Commerce and Industry of Postmasburg	As business chamber we welcome the new developments but need to address the past, current and future impacts on out town, business and industrial areas. The town is currently under strain with past developments and the following issues need to be rectify before even more pressure is put on our town and infrastructure: 1.With the establishment of Kolomela mine in 2010 there was a promise to upgrade the existing R325 road to Kolomela mine through the industrial area to Beeshoek mine to accommodate the additional traffic loads. Part of the damaged road was resurfaced, but no upgrades were done to the existing road to accommodate traffic volumes and loads. 2. The current drive of Kumba to support local suppliers must also accommodate the new businesses in town and industrial area. With no property available the town need Industrial Development of serviced plots for new local suppliers?	The comments do not relate specifically to the proposed expansion activities and have been communicated to Kolomela Public Affairs and it will be addressed accordingly. Once responses have been issued, it will be incorporated in the EIA report to be submitted to the CA. Good day Morne, Thank you for the comments received. As per our previous discussion, the comments in general do not directly relate to the Environmental Impact Assessment for the expansion of Kolomela. The comments have however been communicated to the relevant persons at Kolomela and they will respond as appropriate. Please feel free to contact me should you have any additional queries. Kind regards Trevor

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
		3. Currently the town do not have a approved waste dumping site and in the meanwhile the mine's waste contractor dump waste at the illegal municipal dumping site. The mine must establish a new waste dumping site for their waste and that of their employees and contractors in town? 4. The establishment of Kumba employees in Postmasburg Airfield neighbourhood remove the only heavy vehicle bypass road around town from Griekwastad road creating additional heavy truck traffic in town. Then Kolomela mine also source iron ore form small mines that increase the traffic in town. The mine must build a new heavy vehicle bypass road from Griekwastad road to Kimberley road? 5. New expansions to the mine put additional stress on the current municipal infrastructure in Postmasburg. There is an urgent need for residential development not only for Kumba employees but also double of the current employees to make property available for Kumba Contractors. Currently backyards become mine hostels for contractors. 6. Bulk infrastructure needs to be upgraded for current additional contractors in backyard hostels, informal settlements, new and future mine expansions? This includes sewer works, pump stations, electrical, water, sewer and road infrastructure.	

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
		7. Kumba should not advertise their projects on national TV and radio because it creates an influx of people that do not find work and become a social burden to the town? The new projects require only local people to be employed. The previous Kolomela project with all the new construction workers created a big burglary, drug and prostitution problem that the town had to deal with.	
06 July 2021	Frederick Pier	Good day Trevor. Trust that this email finds you well.. Kindly note that this area was an area where our people of Griqua descent were staying. We are also aware of remains from gravesites during previous excavations at Kolomela mine. We would like to draw the attention of your office to the above mentioned issue. Please make sure that no Gravesites is in the areas where you are going to do your excavations. if any remains are located in this areas, Please feel free to contact us on this address. Regards Mr Frederick Pier 0731877513	Good morning Frederick, I apologise for the belated response. Your comments have been captured and communicated to Kolomela. The application that we are currently busy with addresses potential impacts related to the proposed expansion activities at the mine. A Heritage Impact Assessment is undertaken to identify potential heritage resources within the proposed footprint. The outcome of the study will be captured in the reports as part of the Environmental Impact Assessment (EIA) and communicated to all Interested and Affected Parties, including yourself. Your comment related to previous impacts have been communicated to Kolomela which will be addressed. Please inform me should you have any further queries. Kind regards Trevor PGS Heritage followed up with Mr Pier and had a discussion around the email submitted. Mr Pier confirmed that he is representing the Huis van die Griekwas van Griekwaland Wes and no longer the Khoisan Revolusie. He indicated that he was previously in contact with representatives of Kolomela when graves were damaged in an area close to Kolomela and Beeshoek mines. However, he did not recall that further engagement occurred with their community from Kolomela's side. Mr Pier undertook to supply further information at a later stage.

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
			Mr Pier, finally, indicated that the need for regular interaction with local communities and stakeholders, representative of communities historically associated with the area must receive attention.
Affected Parties			
Landowners/Lawful Occupiers of Adjacent Properties			
02 July 2021	Johan Kotze Farm Floradale	During a phone conversation with Mr. Kotze, he raised concerns regarding the following factors: Mr. Kotze indicated that he is concerned about the effect of dewatering on groundwater. He also indicated that the noise associated with the mining activities is clearly audible at his residence.	Trevor Hallatt indicated during the conversation that a Ground Water Specialist Study is being undertaken which will indicate whether the expansion activities at Kolomela will have an effect (increase or not) on dewatering. The study will also determine whether the dewatering will have an impact on groundwater users. A Noise Impact Assessment will also be undertaken to determine the potential impacts that the expansion activities will have on Noise Sensitive Receptors in the area. The reports will be communicated to all IAPs for review and comment.
Commenting authorities o **Department of Water and Sanitation (Northern Cape)** o **Department of Agriculture, Forestry and Fisheries (Northern Cape)** o **Department of Mineral Resources (Northern Cape)** o **Department of Environment and Nature Conservation (Northern Cape)** o **Department of Land Reform and Rural Development (Northern Cape)** o **Department of Economic Development and Tourism (Northern Cape)** o **Department of Roads and Public Works (Northern Cape)** o **Department of Social Development (Northern Cape)**			
No comments received			
South African Heritage Resources Agency			
12 May 2021	South African Heritage Resources Agency	Good morning,	Good morning, Duly noted, an application will be submitted on SAHRIS website. Kind regards Trevor

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
		Please note that all development applications are processed via our online portal, the South African Heritage Resources Information System (SAHRIS) found at the following link: http://sahra.org.za/sahris/. We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions. Please create an application on SAHRIS and upload all documents pertaining to the Environmental Authorisation Application Process. As per section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA), an assessment of heritage resources must form part of the process and the assessment must comply with section 38(3) of the NHRA. Once all documents including all appendices are uploaded to the case application, please ensure that the status of the case is changed from DRAFT to SUBMITTED. Please ensure that all documents produced as part of the EA process are submitted as part of the application.	
30 July 2021	South African Heritage Resources Agency	The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit notes the pending assessment of the impact to heritage resources. The pending HIA must comply with section 38(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA).	These comments are noted and further comments will be addressed during the impact assessment phase of the EIA.

DATE	NAME	CORRESPONDENCE RECEIVED	EAPs RESPONSE TO ISSUES AS MANDATED BY THE APPLICANT
		The archaeological component of the HIA must be conducted by a qualified archaeologist and must comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessments. The palaeontological component of the HIA must be conducted by a qualified palaeontologist and must comply with the SAHRA 2021 Minimum Standards: Palaeontological Components of Heritage Impact Assessments. The draft EIA and appendices must be submitted in order for an informed comment to be issued. Further comments will be issued upon receipt of the above requested documents. Should you have any further queries, please contact the designated official using the case number quoted above in the case header.	

9. ENVIRONMENTAL ATTRIBUTES

9.1 Climate

9.1.1 Wind

The wind field at Kolomela mine is dominated by winds from the north which correlates with the period 2017-2018 with winds that dominated from the north east. The strongest winds (>6 m/s) were also from this direction. Calm conditions occurred 10.5% of the time, with the average wind speed over the period calculated as 2.7 m/s. Wind speeds decreased during the night-time conditions with an increase in calms from 11.7% during the day to 21.4% during the night.

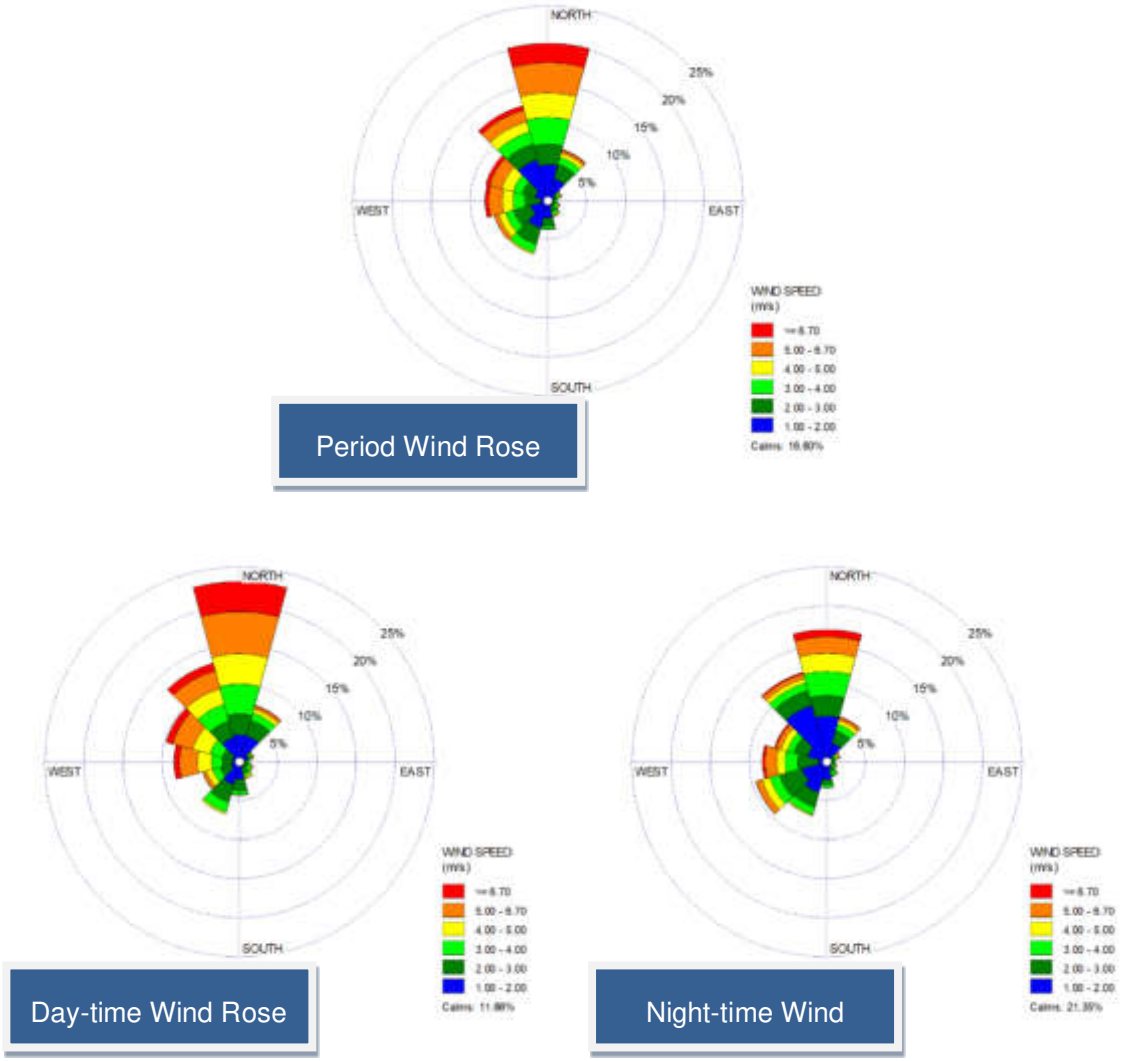


FIGURE 9-1: PERIOD, DAY- AND NIGHT-TIME WIND ROSES FOR KAPSTEVEL (2019 – 2020)
SOURCE: NOISE IMPACT ASSESSMENT FOR KOLOMELA MINE (AIRSHED, 2021)

9.1.2 Temperature

Temperatures ranged between -7°C and 38°C. The highest temperatures occurred in December and the lowest in July. During the day, temperatures increase to reach maximum at around 14:00 in the afternoon. Ambient air temperatures decrease to reach a minimum at around 06:00 i.e. just before sunrise.

TABLE 9-1: MONTHLY TEMPERATURE SUMMARY

Hourly Minimum, Hourly Maximum and Monthly Average Temperatures (°C)												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum	10.7	12.4	6.5	3.0	-2.3	-7.1	-4.9	-4.5	-0.3	2.2	6.8	8.4
Maximum	37.9	37.1	36.0	32.2	29.4	26.3	25.9	29.0	34.3	36.9	38.1	36.3
Average	27.4	25.2	24.1	19.0	16.2	11.6	11.5	12.7	18.0	21.7	24.0	24.9

9.1.3 Rainfall and evaporation

Postmasburg is situated within a low rainfall area with a mean annual rainfall of approximately 285 mm. Rainfall is highly unpredictable with most rainfall occurring between November and April. The rainfall usually falls as a result of thunderstorms when tropical thunderstorm activity extends southwards over the Kalahari. Mean annual evaporation (2 450mm) is higher than annual rainfall (374 mm), which results in a major net moisture deficit of over 2 000 mm throughout the year.

9.2 Topography and hydrology

The regional topography is characterised by a flat, gently undulating plains interspersed with hills and mountains as the surrounds; with the valleys being used for extensive mining and farming activities while steep mountainous ridges being inhabitable. There are gradient changes from the mine to the hills towards Wolhaarkop and elevated mountainous terrain towards the north-east, north-west and west of the site. The topography is somewhat flat towards the south, south-east and north with small sections of high topography protruding.

A Digital Elevation Model was created by Design Point, as part of the Hydrology Assessment (Annexure M – Part C) from Lidar survey data as indicated in the Figure 9-2. The majority of the study area slopes gently to the south west towards the Groenwaterspruit which flows south and converges with the Skeyfonteinspruit to form the Soutloop river, south of Kolomela mine. The following provides a summary of the topography at Kolomela:

- The high point of the terrain (grey areas) elevation is in the north-eastern area of the site, i.e., between 1 305 and 1 310 meter above sea level (masl).
- The low point of the terrain (green-yellow areas) elevation is in the southern boundary of the site, i.e., between 1 194 and 1 196 meter above sea level (masl).

- Most of the terrain can be consider as having a slight slope (less than 1%) toward the low point of the terrain.
- There are various established topographic watercourses, that are indicative of flow well defined flow directions in the southern regions of the site.
- The Leeuwfontein, Klipbankfiontein and Kapstevel pits can act as runoff sinks (holes).
- Several pans are distributed across the flat-lying, central portions of the area which collect and hold rainwater for short periods after seasonal rainfall.

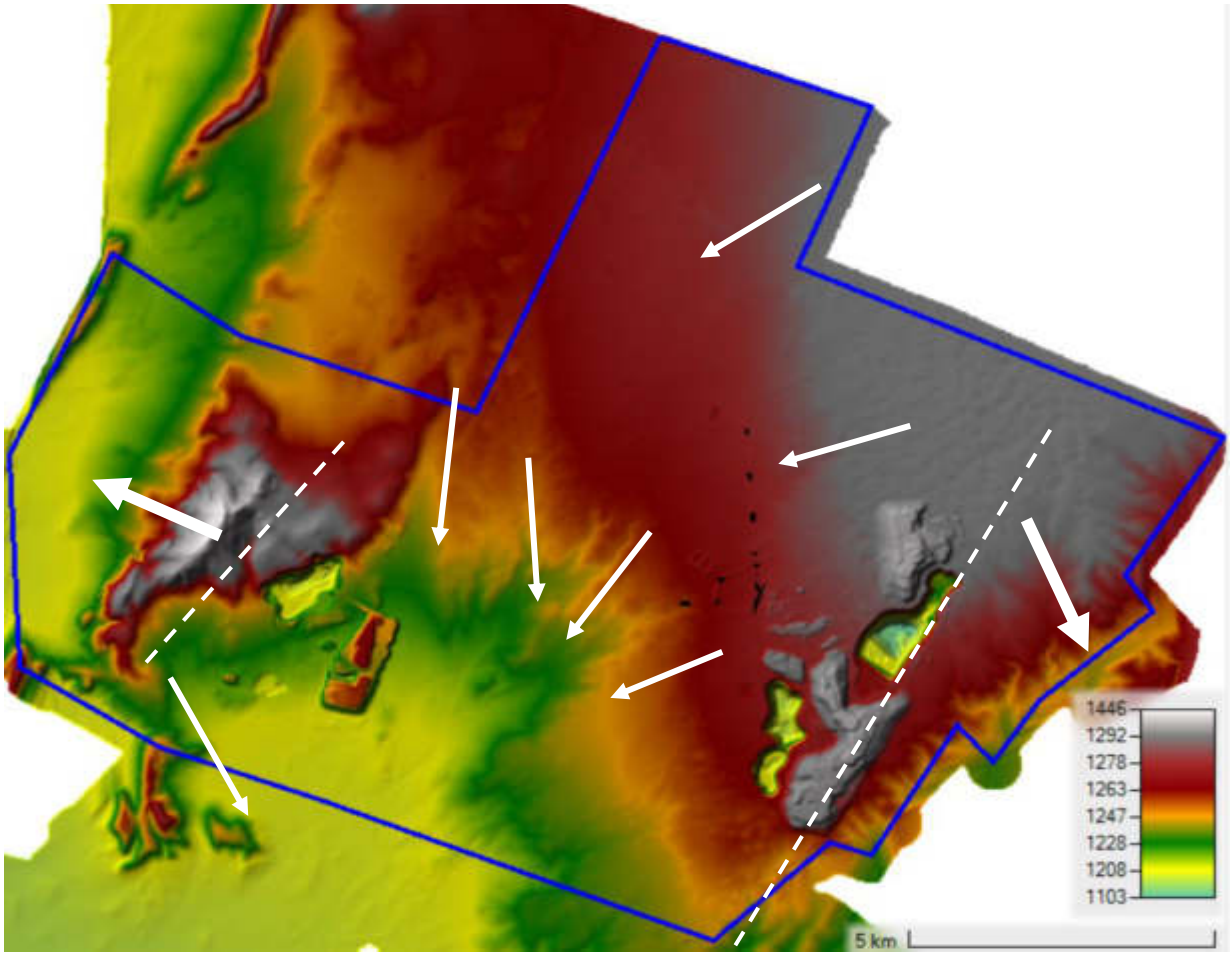


FIGURE 9-2: KOLOMELA MINE BROADER AREA TOPOGRAPHY AND PRIMARY RUNOFF FLOW DIRECTIONS

SOURCE: HYDROLOGY ASSESSMENT FOR KOLOMELA MINE (DESIGN POINT, 2021)

9.3 Air Quality

According to Air Quality Impact Assessment (Annexure A of Part C) (Airshed, 2021), the region is characterised as being a relatively dry, arid, and dusty environment. It is expected that various local and far-a-field sources contribute to suspended fine particulate ([1]PM2.5 and [2]PM10) concentrations in the region. Local sources include wind erosion from exposed areas. The results

1 Particulate matter with an aerodynamic diameter of less than 2.5 μm

2 Thoracic particulate matter with an aerodynamic diameter of less than 10 μm

of the 2020 PM10 and PM2.5 monitoring are shown in Table 9-2 and Table 9-3, respectively.

TABLE 9-2: SUMMARY OF PM10 CONCENTRATIONS FOR 2020

Station	Data availability (%)	Number of exceedances of 75 µg/m³	Annual average (µg/m³)	Compliance with [3]NAAQS
Heuningkranz	97	-	9	YES
Kappieskaree	78	12	28	NO
Kapstevel	97	16	30	NO
School	47	1	29	YES

TABLE 9-3: SUMMARY OF PM2.5 CONCENTRATIONS FOR 2020

Station	Data availability (%)	Number of exceedences of 40 µg/m³	Annual average (µg/m³)	Compliance with NAAQS
Heuningkranz	90	-	4	YES
Kappieskaree	93	-	6	YES
Kapstevel	95	-	6	YES
School	48	10	19	NO

The PM10 concentrations recorded around Kolomela Mine are not in compliance with the National Air Quality Standards (NAAQS). Kappieskaree and Kapstevel were in non-compliance with the daily PM10 limits (exceeded 75 µg/m³ for over 4 days of the year). This occurs mostly during the spring months (when the area is dry after winter, rainfall is low and the wind speeds increase), and will be a combination of Kolomela sources as well as other sources in the vicinity. The ambient air quality in the vicinity of Kolomela is in compliance with the NAAQS limits for PM2.5, with the exception of the school, but data availability was poor for the year. However it should be noted that the PM10 concentration includes all sources in the area, it is not only due to Kolomela mine.

Dust fall also shows non-compliance with the national dust fallout limits as prescribed by the National Dust Control Regulations. The location of the Kolomela dust fallout monitoring points are shown in Figure 9-3. Results for the 2018 to 2020 monitoring campaign are shown in Figure 9-3. It should be noted that even locations upwind of the mine (for example bucket number 5) show elevated dust fall levels. This indicates the contribution of other sources to the non-compliance with the NDCR.

3 National Air Quality Standards

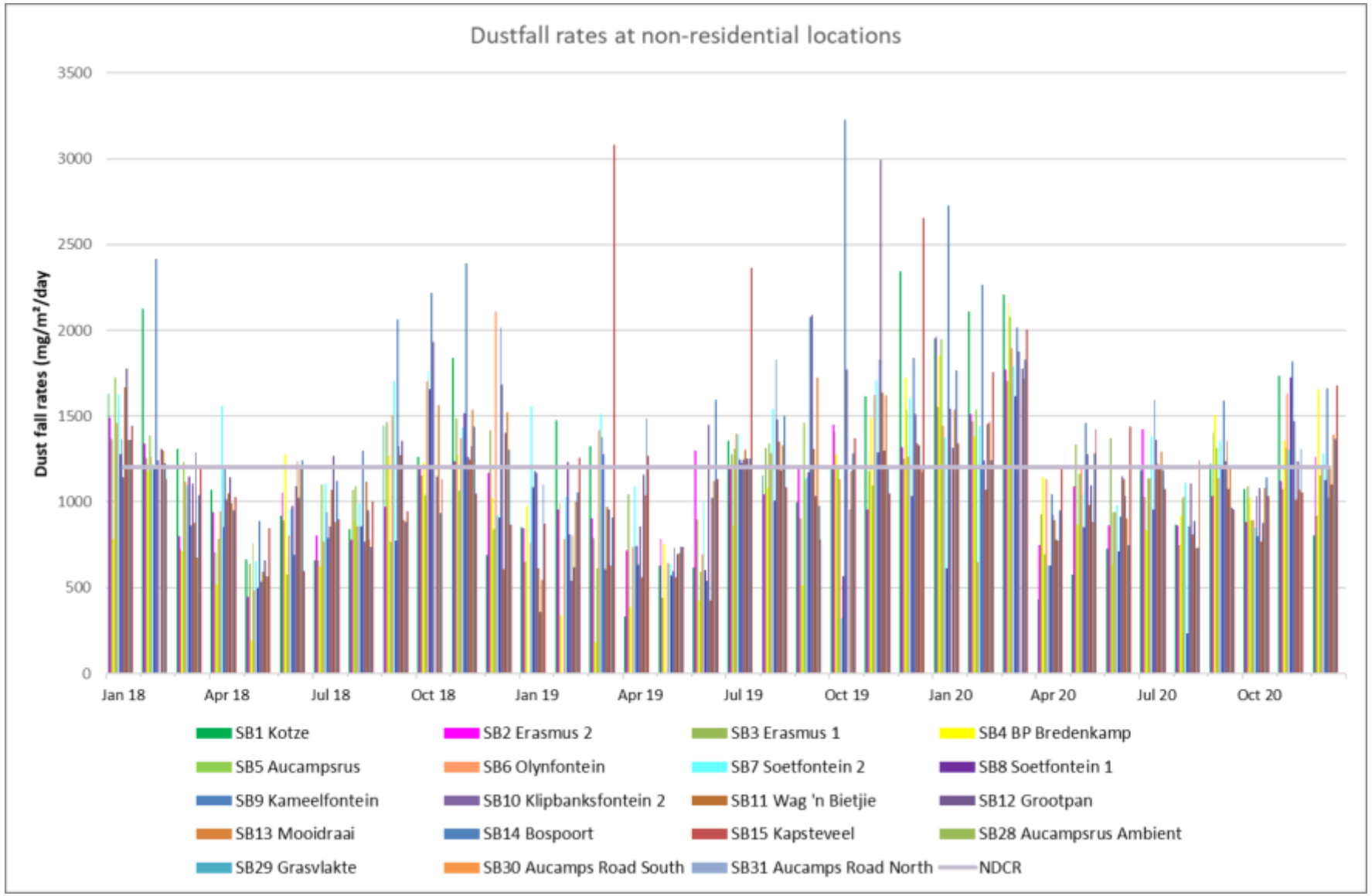


FIGURE 9-3: RESULTS OF THE 2018-2020 DUSTFALL MONITORING CAMPAIGN – OFF-SITE DUST BUCKETS

SOURCE: AIR QUALITY IMPACT ASSESSMENT FOR KOLOMELA MINE (AIRSHED, 2021)

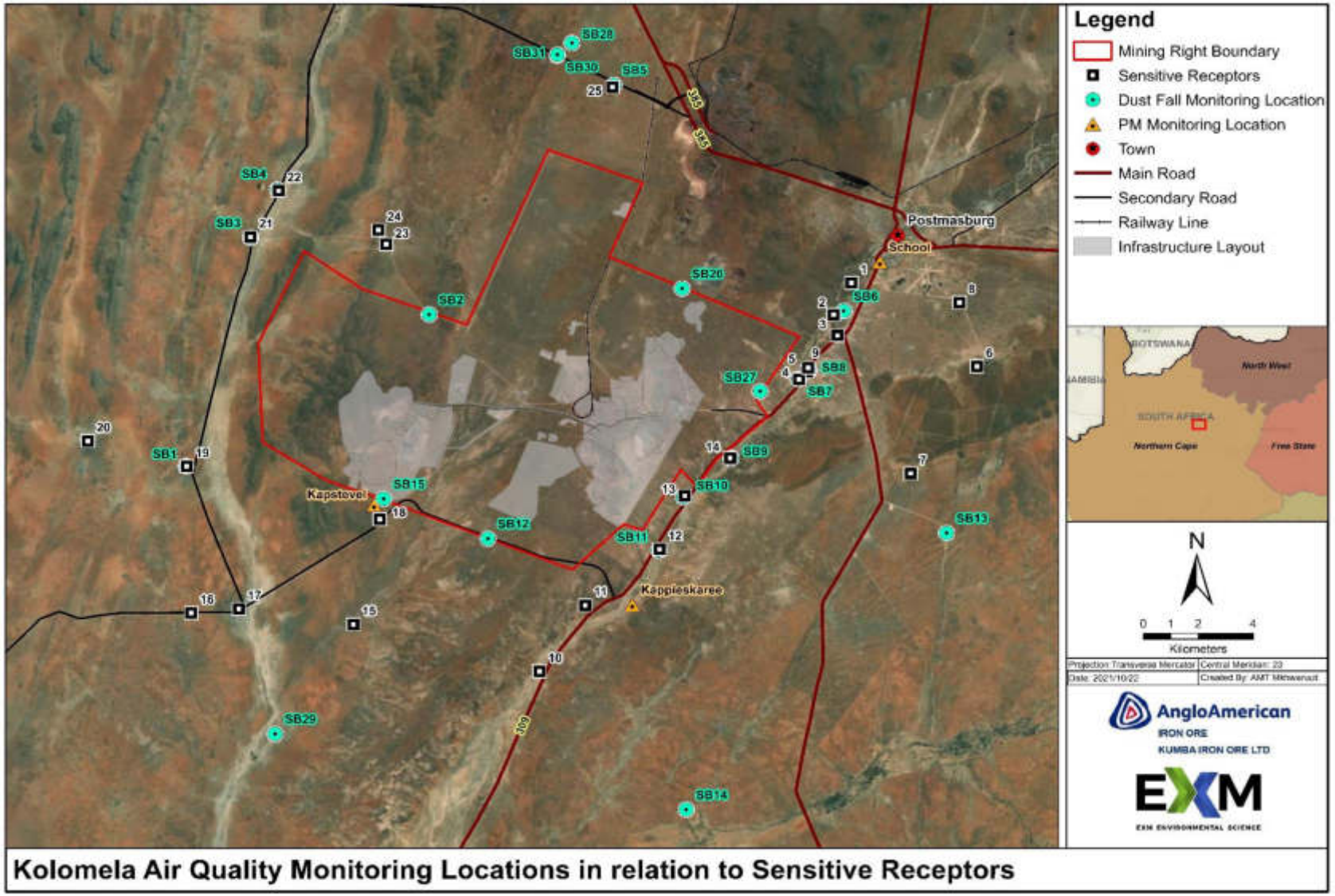


FIGURE 9-4: AIR QUALITY SAMPLING LOCATIONS

SOURCE: AIR QUALITY IMPACT ASSESSMENT FOR KOLOMELA MINE (AIRSHED, 2021)

9.4 Noise

According to the Noise Impact Assessment (Airshed Planning Professionals, 2021) (Annexure B of Part C), the Noise Sensitive Receptors (NSRs) in the vicinity of the airport, as indicated in Figure 9-5 below, include the residential areas of Beeshoek, Boichoko, Newtown and Postmasburg. Individual homesteads also surround the project area. The closest NSR likely to be affected by the proposed amended layout include NSR7, NSR8 and NSR9 which lies east of the Leeuwfontein mining area and NSR16 which lies south of the Kapstevel mining area.

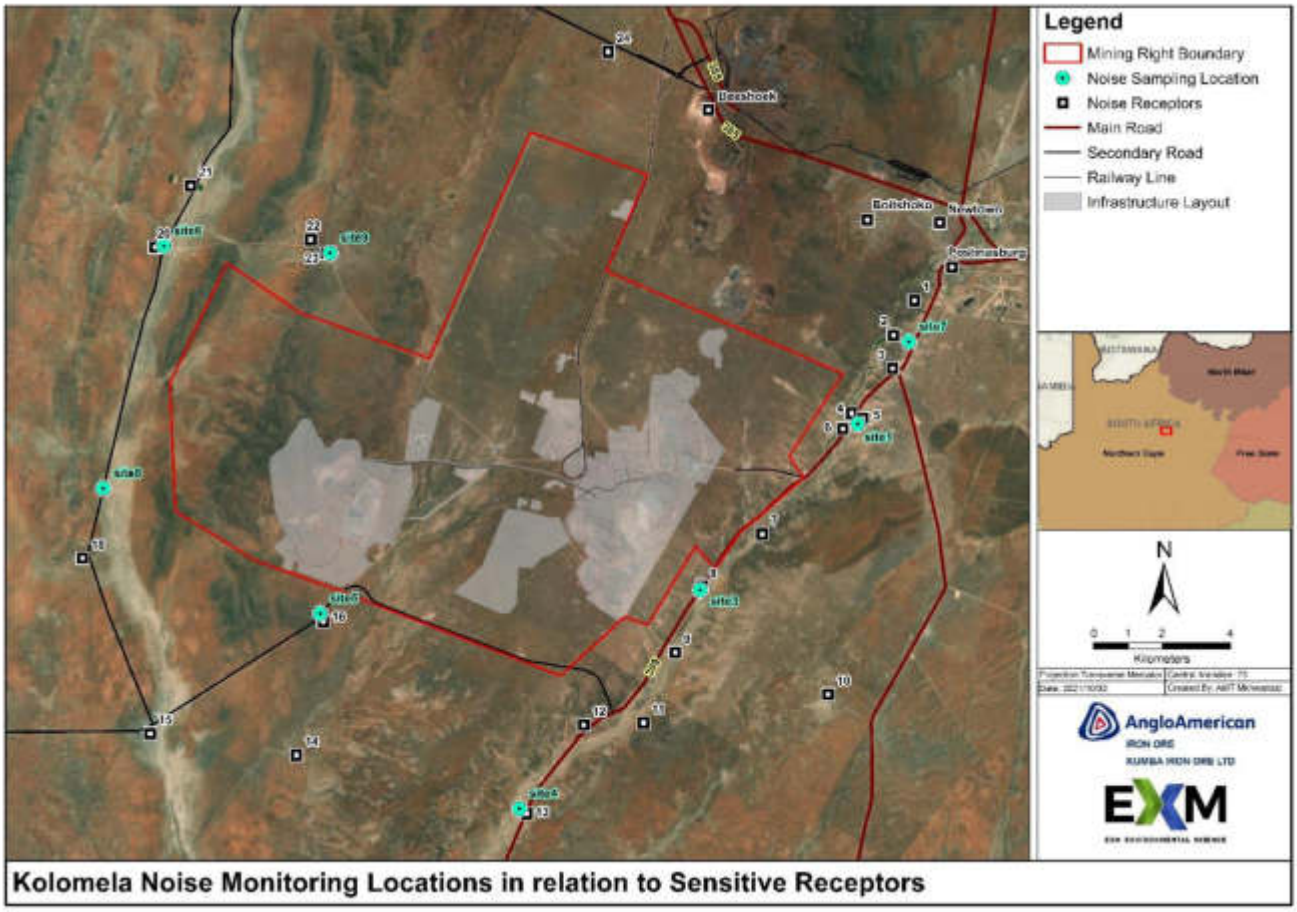


FIGURE 9-5: NOISE SENSISTIVE RECEPTORS

(SOURCE: NOISE IMPACT ASSESSMENT - AIRSHED, 2021)

As indicated by the wind rose in Section 9.1, the predominant wind direction is from the north. On average, noise impacts are expected to be more notable south of the project activities and noise impacts are generally more notable during the night.

Day and night time baseline noise monitoring was undertaken on the 6th to 8th July 2021 the results were compared with the International Finance Corporation Guidelines on Environmental Noise. The monitoring results indicated (as shown in Figures 9-6 and 9-7) that baseline noise levels at all the sampling locations were below the IFC guidelines for residential areas.

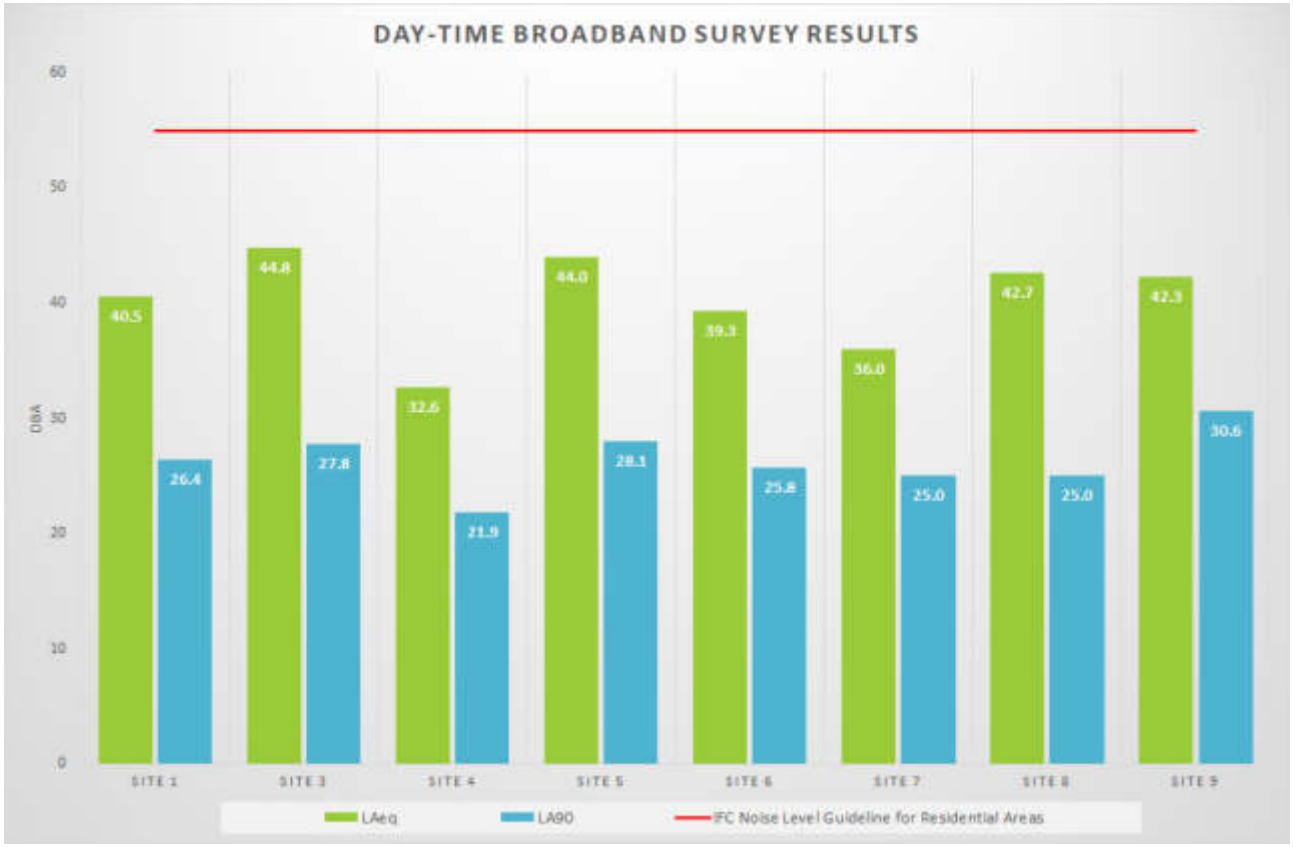


FIGURE 9-6: DAY-TIME BROADBAND SURVEY RESULTS

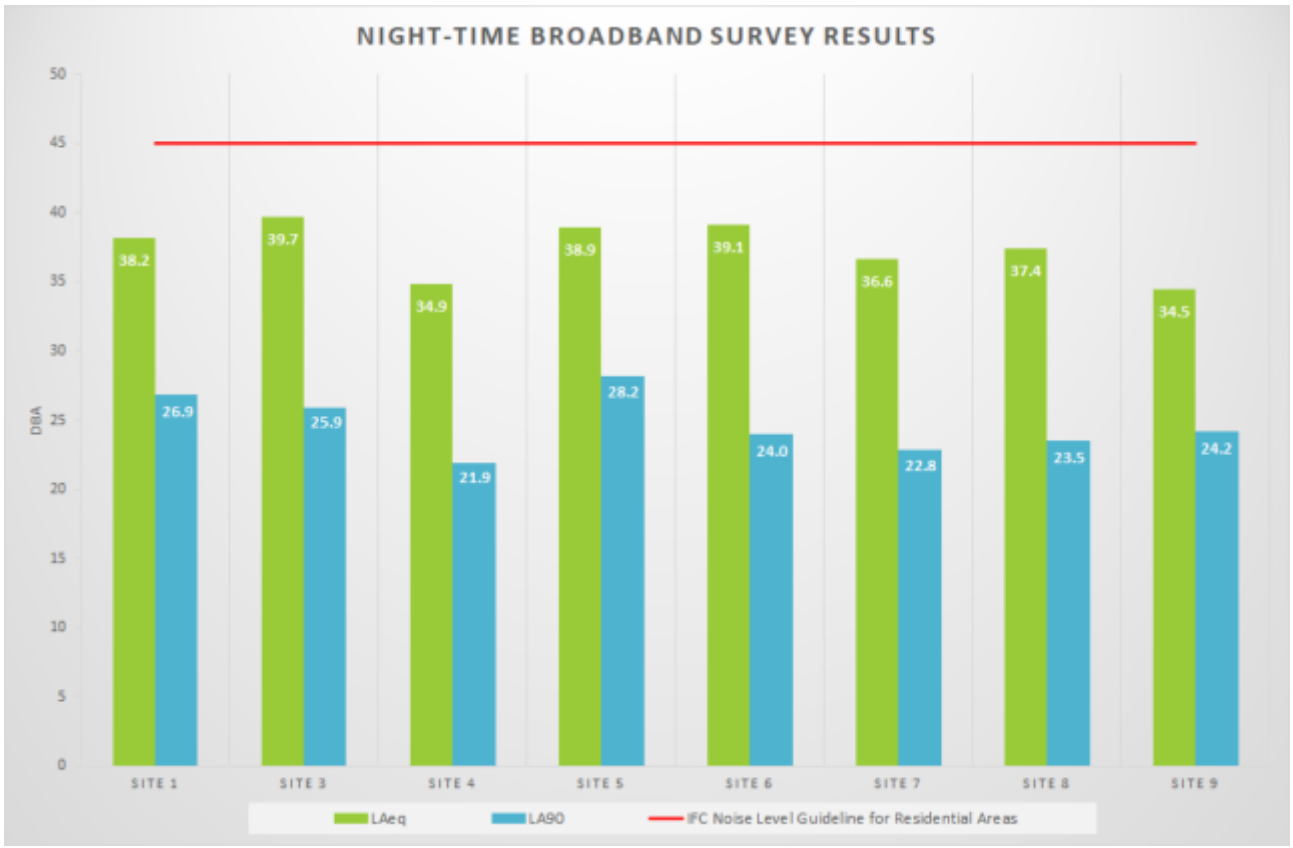


FIGURE 9-7: NIGHT-TIME BROADBAND SURVEY RESULTS

(SOURCE: NOISE IMPACT ASSESSMENT - AIRSHED, 2021)

9.5 Visual

According the Visual Impact Assessment (EXM, 2021 – Annexure H of Part C), the critical visual receptors (as indicated in Figure 9-8) identified for the existing and proposed expansion project includes residents (nearby dwellings, settlements and sparsely located homesteads), educational facilities (primary and secondary schools), national heritage sites, nature reserves and motorists and tourists). Tourists have been included under motorists as their interaction with the environment is limited primarily to driving past the existing and proposed expansion project area en-route to tourist attractions in the Postmasburg region. Tourists have also been included in the National Heritage and Nature Reserve receptor category as the Langeberg Nature Reserve is located within the 30km. The surrounding mines have been excluded as a critical receptor as their sensitivity towards the proposed extension.

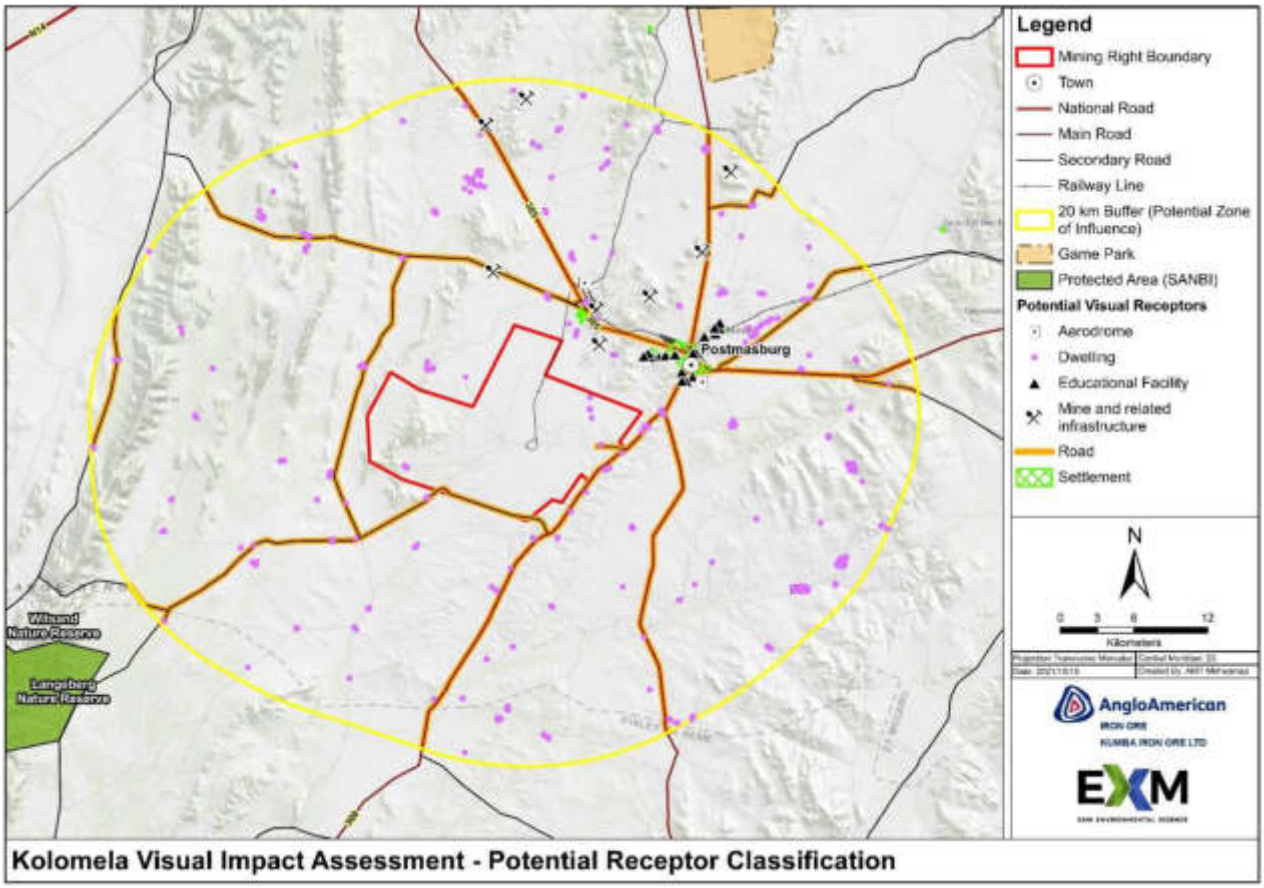


FIGURE 9-8: POTENTIAL VISUAL RECEPTORS

(SOURCE: VISUAL IMPACT ASSESSMENT - EXM, 2021)

9.6 Biodiversity - General

This section provides an overview of the baseline biodiversity environmental associated with Kolomela mine which is related to the current/existing and proposed activities. The subsequent sections provide the baseline for the areas that were assessed for new and expanded activities specifically as those areas were not covered by previous biodiversity studies. The risk assessment undertaken in section 10 focussed on cumulative impacts from both existing and new/amended activities, based on the baseline environmental description in this section.

Kolomela is located in the Savanna Biome in the Eastern Kalahari Bushveld Bioregion. It falls within the Kuruman Mountain Bushveld (SVk10) and Postmasburg Thornveld (SVk 14). The Groenwaterspruit at Leeuwfontein falls within the Postmasburg Thornveld and the Southern Kalahari Salt Pans (Azi4) vegetation type is represented at Ploegfontein (Mucina & Rutherford 2006). Although a number of endemic or near-endemic plant species occur in these vegetation types, they are not regarded as veld types needing protection.

9.6.1 Vegetation types

Eight vegetation types has been identified at Kolomela mine (Zietsman, 2019), as shown in the Figure below.

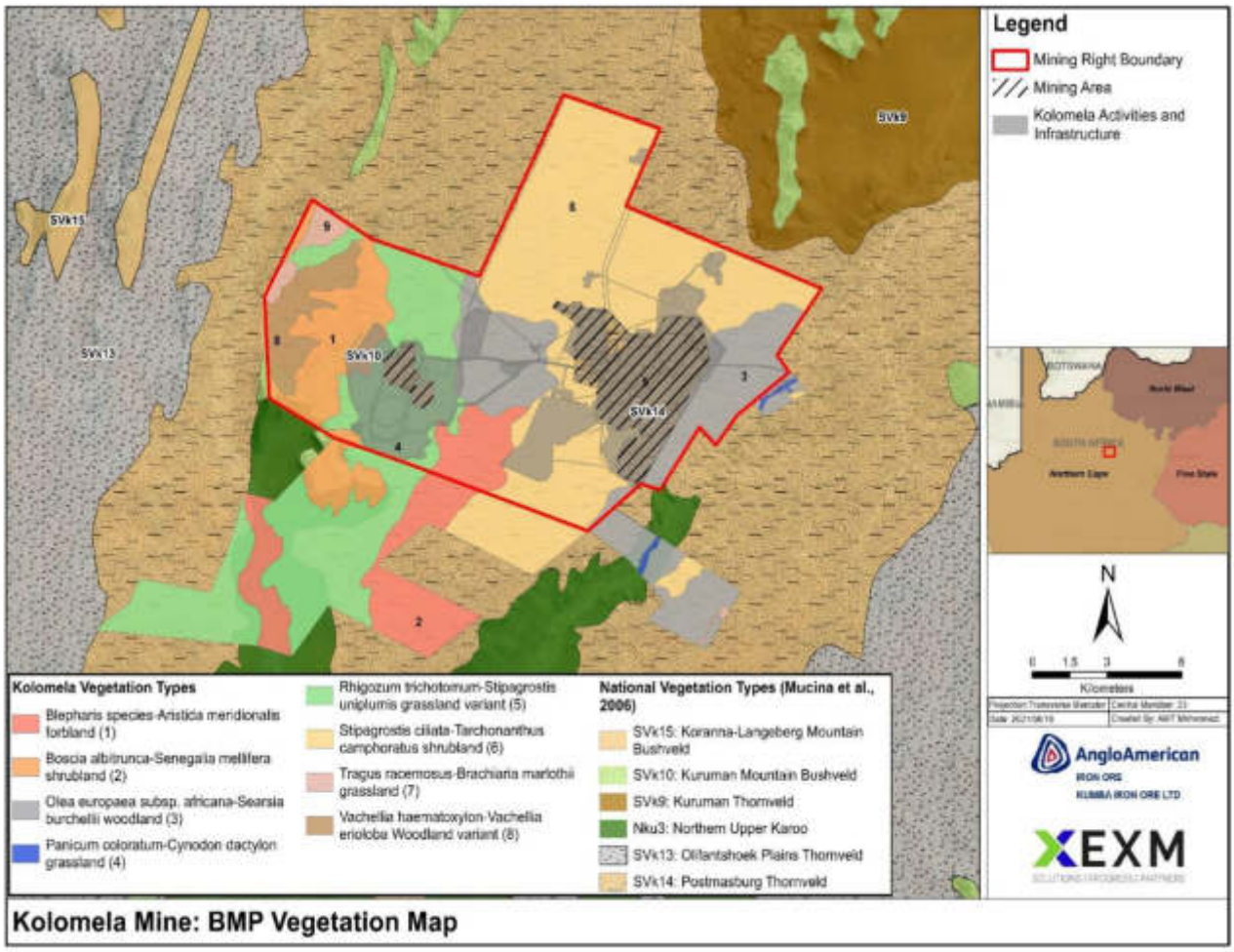


FIGURE 9-9: VEGETATION TYPES

9.6.2 Sensitive areas within Kolomela and associated species

Several sensitive areas have been identified on Kolomela in terms of the characteristic of the biodiversity in the area. The information in this section is an abstract obtained from the reports on the vegetation diversity assessment that forms part of the Kolomela biomonitoring programme. The sensitive areas are illustrated in Figure 9-22 and described the following sections.

9.6.2.1 Lithops aucampiae subsp. aucampiae community

Lithops aucampiae subsp. *aucampiae*, a very rare mesem species that is endemic to the Ghaap Plateau, occurs in the Dwarf Karroid Shrubland east of Kapstevel. The habitat is characterised by extremely shallow soil and exposed limestone outcrops and no cover from shrubs or trees, which creates an extremely very harsh micro-environment. *Titanopsis calcarea*, also a protected mesem, occurs in this area as well.

9.6.2.2 Pachypodium succulentum

One of the biggest and densest populations of *Pachypodium succulentum* (Dikvoet) at Kolomela occurs on the quartzite outcrop just east of the old Witsand road, south of the existing Kapstevel pit. The outcrop continues across the road towards the south. The latter area is disturbed and, although not in the same pristine state as the population north of the road, there is also a fairly large population of Dikvoet individuals on this part of the outcrop.

9.6.3 Biodiversity Management Units

The Kolomela biomonitoring programme commenced in 2010 in collaboration with the Centre for Environmental Management at the University of the Free State. Six (6) Biodiversity Management Units (BMUs) (as summarised in Table 9-4 and illustrated in Figure 9-9) were developed as part of Kolomela's biomonitoring programme and were based on vegetation types associated with the Kolomela mining right are which is to a large extent indicative of sensitive areas and species.

The following criteria were used to select BMUs:

- The accurate delineation of the vegetation types;
- Uniqueness of the specific area within Kolomela including rare habitat or protected species; and/or
- Representative of large areas of vegetation within Kolomela.

TABLE 9-4: BIODIVERSITY MANAGEMENT UNITS ASSOCIATED WITH KOLOMELA

	BMU	Area (ha)	Residual impact (ha)	Buffer zone (ha)	Total area disturbed (ha)	% Disturbed
1	Wolhaarkop Sandveld	1 210	0	0	0	0.0
2	Black Thorn Shrubland	1 837	0	0	0	0.0
3	Rhigozum Grassland	5 988	483	147	630	10.5
4	Wild Olive Woodland	3 689	37	56	93	2.5
5	Camphor Bush Panveld	9 460	1 940	358	2 298	24.3

	BMU	Area (ha)	Residual impact (ha)	Buffer zone (ha)	Total area disturbed (ha)	% Disturbed
6	Dwarf Karroid Shrubland	1 860	13	31	44	2.4

TABLE 9-5: SUMMARY OF THE BIODIVERSITY MANAGEMENT UNITS ASSOCIATED WITH KOLOMELA

BMU	Flora	Fauna	Condition/conservation value
BMU 1: Wolhaarkop Sandveld	Vachellia erioloba (Camel Thorn tree/Kameeldoring) and Boscia albitrunca (Shepherd's tree/Witgat) are both protected and common in this BMU. The relatively rare Vachellia haematoxylon (Grey Camel Thorn tree) is also protected and is common in this BMU.	Small spotted cat, Felis nigripes (Specially Protected), is more commonly encountered in sandveld than not, while some species that potentially occur at Kolomela, like Short-tailed gerbil Desmodillus auricularis would likely only occur in sandveld	Although generally in a healthy ecological condition, the decline in the productivity of the small sandveld pocket located close to the mining activity east of Wolhaarkop is of concern. This BMU has a very high conservation value.
BMU 2: Black Thorn Shrubland	Sensitive habitats are prevalent in this area and include the quartzite ridges where a protected species, Pachypodium succulentum, occurs. Aloe hereroensis is found on the rocky outcrops.	This is one of the BMUs where Pangolin, Manis temminckii, (Specially Protected, Vulnerable) might be found and the Pachydactylus capensis, the Cape gecko, ([4]TOPS) was collected in this area (Butler 2013).	Swarthaak encroachment is evident. Moderate biodiversity value.
BMU 3: Rhigozum Grassland	A number of geophytes occur in this area, all are provincially protected.	Pachydactylus capensis, the Cape gecko, (TOPS) was collected in this area (Butler 2013).	Swarthaak encroachment is evident. Moderate biodiversity value.
BMU 4: Wild Olive Woodland	Dwarf succulents such as Prepodesma orpenii, Avonia papyracea, and Euphorbia wilmaniae occur on rocky outcrops. These species have a high conservation status and the rocky outcrops are therefore regarded as sensitive.	This is one of the BMUs where Pangolin, Manis temminckii, (Specially Protected, Vulnerable) might be found.	This vegetation unit is ecologically not in a totally degraded condition. This BMU has a very high conservation value.
BMU 5: Camphor Bush Panveld	Searsia tridactyla, a near endemic, is common in this veld	Numerous bird species of which most are protected in the Northern Cape, make use of this area when the pans have water, e.g. South African Shelduck and Cape Shoveler. Giant bullfrog, Pyxicephalus adspersus (Specially Protected) might occur seasonally at pans in this Relatively high diversity with moderate endemism of terrestrial invertebrates expected.	The main mining operation is located in this vegetation type. The entire panveld is regarded as a sensitive habitat. This BMU has a very high conservation value. Approximately 24.3% of this unit will be affected by mining activities.
BMU 6: Dwarf Karroid Shrubland	Very high diversity with a large number of endemic or near-endemic plants species, e.g. Lithops aucampiae.	This is one of three BMUs where Pangolin, Manis temminckii, (Specially Protected, Vulnerable) might be found. At least three bird species, the Secretary Bird, Kori Bustard and Ludwig's Bustard (all TOPS listed), frequent this veld type. The Cape gecko, (TOPS) was collected in this area.	This BMU has a very high conservation value. There is evidence that this vegetation unit was previously subjected to heavy grazing and it is still the most degraded vegetation unit on the main Kolomela property.

[4] Threatened or Protected Species (TOPS): Species protected in terms of the National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004) (NEMBA),

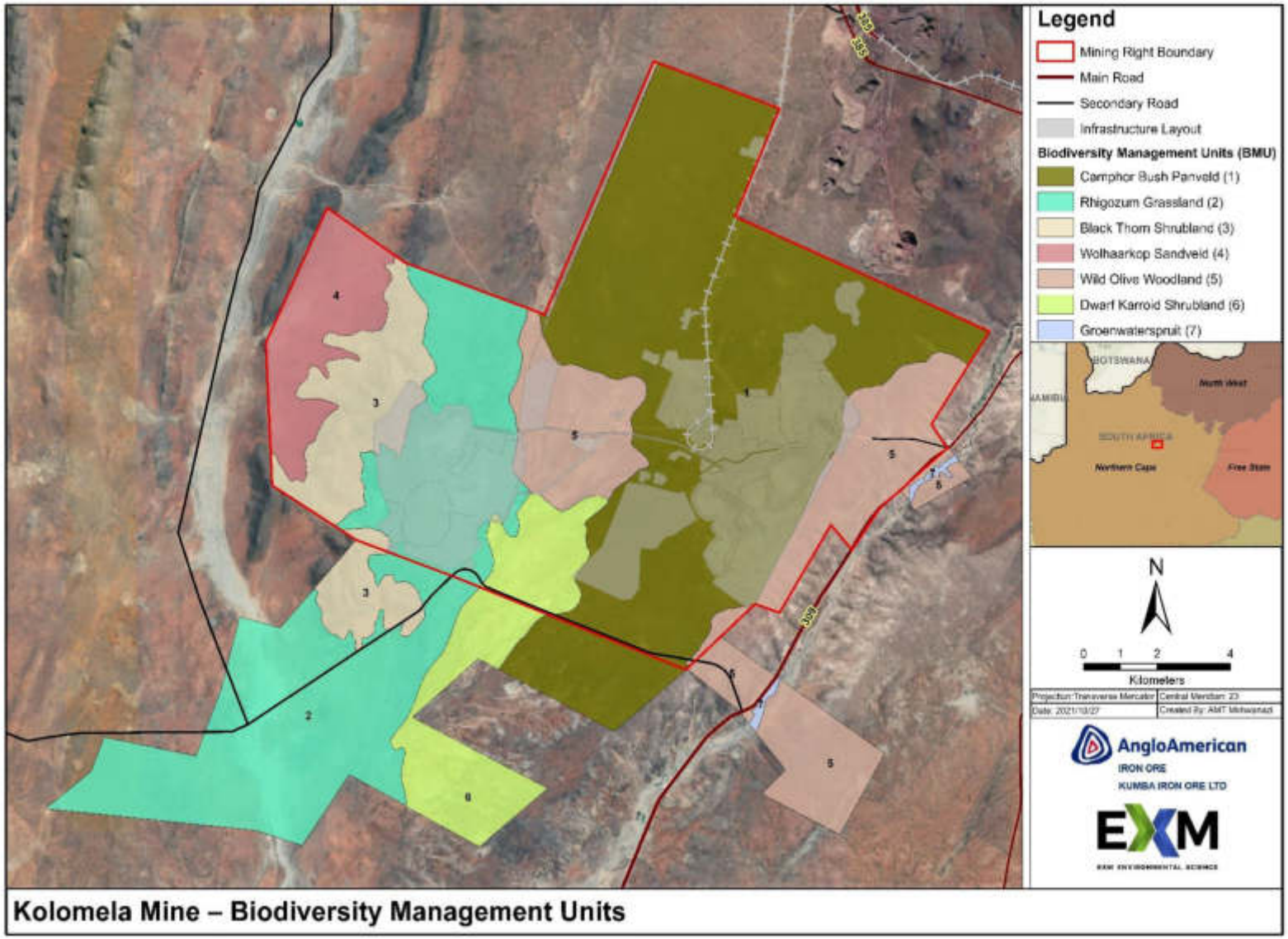


FIGURE 9-10: KOLOMELA BIODIVERSITY MANAGEMENT UNITS

9.7 Biodiversity – Flora

The following description was derived from the Floral Assessment conducted by Scientific Terrestrial Services (September, 2021) (Annexure C of Part C). Due to the fact that all current infrastructure areas have previously been assessed by Omni Eko in 2015, the following description focuses on the new areas which will be affected by the expanded activities and infrastructure.

The study area is situated within two general vegetation types, namely the Postmasburg Thornveld (comprising most of the focus area) and the Kuruman Mountain Bushveld (comprising a small section in the west of the focus area). Both vegetation types are listed as least concern in Mucina and Rutherford (2006). The focus area is located within the Griqualand West Centre (GWC) of plant endemism. This semi-arid region is broadly described as Savanna, forming part of the Eastern Kalahari Bushveld Bioregion.

9.7.1 Habitat Units

Based on the results of the field investigation conducted by STS, five broad habitat units (as summarised in Table 9-6 and illustrated in Figure 9-11) were distinguished for the additional areas that will be impacted by the expansion activities. The areas for the existing and approved infrastructure was assessed during the previous EIAs. The STS assessment also correlated the habitat units with the Kolomela BMUs to align the existing data with the on site findings. The Table below contains a description of the habitat units identified during the floral assessment. Refer to Section 3.2 of the floral assessment for details.

TABLE 9-6: SUMMARY OF HABITAT UNITS

(Source: Floral Impact Assessment - STS, 2021)

Habitat Unit	Description	Ecological importance
Thornveld Habitat Unit	This habitat unit is characterised by the presence of thorny woody species, particularly *Vachellia* and *Senegalia* species. Different community compositions were supported within the habitat unit and as such, three subunits, including *Senegalia-Tarchonanthus* Thornveld, *Senegalia* Thornveld and Kalahari Thornveld. This habitat unit provides suitable habitat to sustain viable populations of several floral Species of Conservation Concern ([5]SCC) and Threatened or Protected Species (TOPS. However, threatened [6]Red Data Listed (RDL) species are less likely to be present within the Habitat Unit.	The Senegalia-Tarchonanthus Thornveld and the Kalahari Thornveld subunits are moderately important from a floral ecological importance and resource management perspective. The remaining subunit, the Senegalia Thornveld, is of a moderately low importance form a floral ecological perspective.
Calcrete Habitat	This habitat can be described as having shallow, gravelly shrublands (in which the grass layer is poorly developed) which were mosaiced between shrubby grassland patches in which shrubs (particularly *Rhigozum trichotomum*) were present (and sometimes encroaching). The habitat is still largely intact, and supports a variety of species. This Habitat Unit is considered representative of the reference Postmasburg Thornveld. The Calcrete habitat unit provides suitable habitat to sustain viable populations of several floral SCC, and TOPS. However, threatened RDL species are less likely to be recorded within the habitat unit	The Calcrete Habitat is important from a floral ecological importance and resource management perspective. The Calcrete Habitat Unit is situated within [7]Critical Biodiversity Area (CBA) 1 habitat and a Centre of Endemism. The CBA1 habitat within the Calcrete Habitat unit was confirmed during the site visit
Mountain Bushveld Habitat	The vegetation associated with this habitat unit was open bushveld and dominant woody species included Diospyros austro-africana, Euclea crispa subsp. crispa, *Olea europaea* subsp. *africana*, *Searsia tridactyla* and *Nymania capensis*. Overall, the habitat unit is in good ecological condition and	The Mountain Bushveld Habitat is important from a floral ecological importance and resource management perspective. The habitat unit is

5 The term SCC in the context of this report refers to all RDL (Red Data Listed) and IUCN (International Union for the Conservation of Nature) listed threatened species as well as protected species of relevance to the project, including nationally and provincially protected species. The Northern Cape Nature Conservation Act, 2009 (Act No. 9 of 2009) (NCNCA), provides a list of Specially Protected Species for the Northern Cape Province. These species formed part of the SCC assessment. The National Forest Act, 1998 (Act No. 10 of 1998) (NFA), affords protection to a list of tree species which were included as SCC in this report.

6 According to the Red List of South African plants (http://redlist.sanbi.org/) and the International Union for Conservation of Nature (IUCN), organisms that fall into the Extinct in the Wild (EW), Critically Endangered (CR), Endangered (EN), Vulnerable (VU) categories of ecological status.

7 A CBA is an area considered important for the survival of threatened species and includes valuable ecosystems such as wetlands, untransformed and ridges.

Habitat Unit	Description	Ecological importance
	supported a moderately high species diversity. This habitat unit is thus considered representative of the reference vegetation type, namely the endemic Kuruman Mountain Bushveld. The Mountain Bushveld Habitat unit provides suitable habitat to sustain viable populations of several floral SCC and TOPS. However, threatened RDL species are less likely to be recorded within the habitat unit	situated within an Ecological Support Area (ESA) habitat and a Centre of Endemism. The habitat unit is in good ecological condition. As such, the classification of the ESA habitat within the Mountain Bushveld Habitat can be confirmed.
Watercourse Habitat Unit	**Watercourse Habitat** This habitat unit includes **Cryptic Wetlands** and **Linear Drainage Lines.** The watercourse habitat is significant from a biodiversity and conservation perspective. Important ecological corridors include the numerous Cryptic Wetlands and the Linear Drainage Lines – albeit more prominent during rainfall events. Habitat integrity varied between the Cryptic Wetlands, many of which have suffered impacts from adjacent mining pressures. Despite the lower species diversity characterised by these features, they remain important in the greater landscape. Loss of watercourse habitat within arid regions is likely to have regional-scale impacts on the associated floral ecology. The Watercourse Habitat (provide suitable habitat to sustain viable populations of several floral SCC. However, threatened RDL and TOPS species are less likely to be recorded within the Watercourse Habitat. **Non-Watercourse Habitat** This habitat unit includes anthropogenic drainage lines and seasonal depressions. From a floral perspective, the non-watercourse habitat is not considered to significantly contribute towards floral ecology within the focus area, nor within the greater region	The Watercourse Habitat are important from a floral ecological importance and resource management perspective. The Non-watercourse Habitat is of a moderately low importance form a floral ecological perspective
Transformed Habitat Unit	This habitat unit consists of areas that have been transformed or largely modified because of mining activities. This habitat unit includes areas where vegetation is significantly degraded or where vegetation is largely absent because of mining-related activities. Floral diversity was low to moderately low within this habitat unit. [8]Alien Invasive Plants (AIPs) were most prolific within this habitat unit.	This habitat unit is not considered to be important from a floral ecological and resource management perspective.

8 Alien Invasive Plants: A species that is present in a region outside its natural range due to human actions (intentional or accidental) that have enabled it to overcome biogeographic barriers. These species have the potential to outcompete indigenous species and cause a loss of biodiversity.

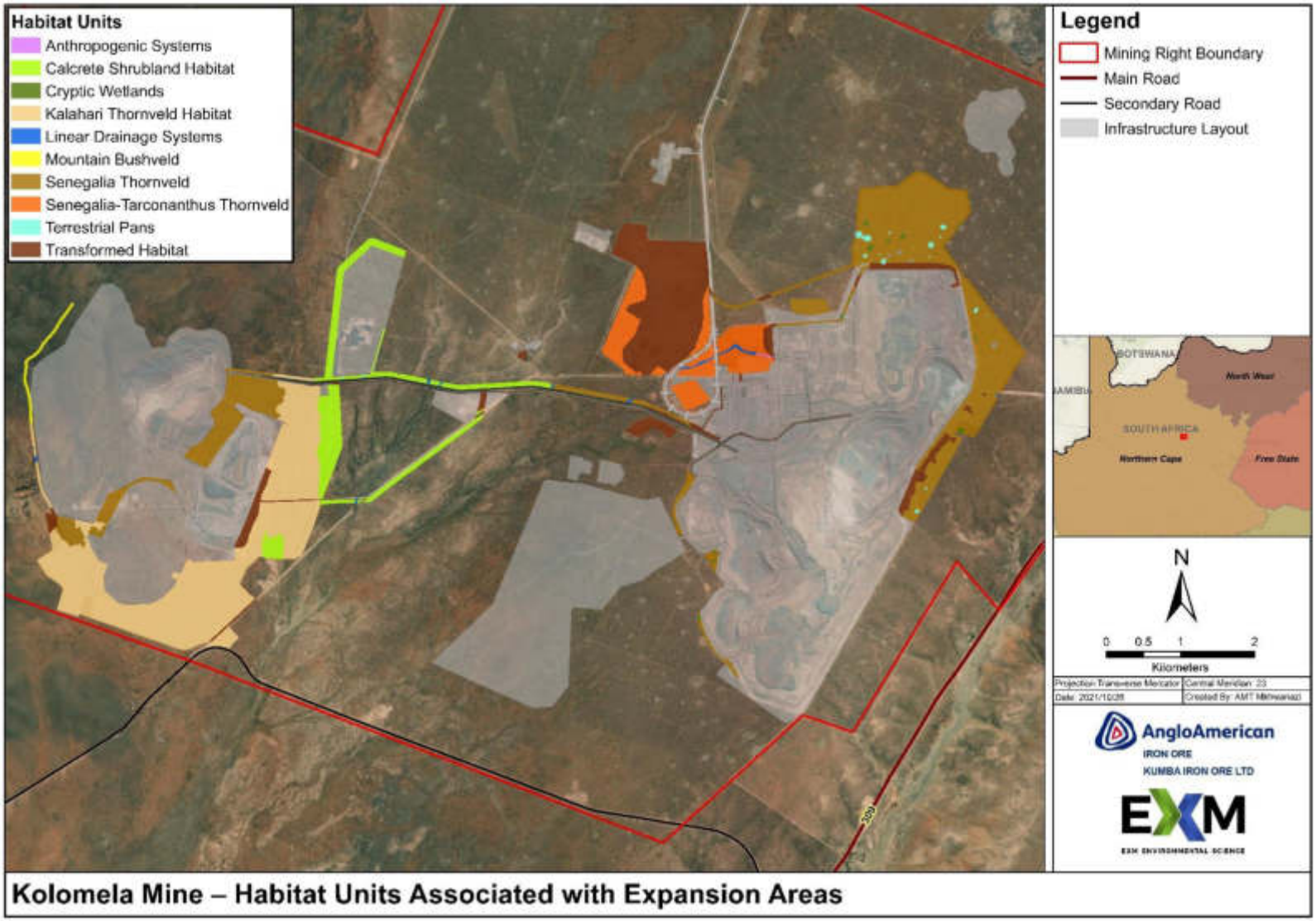


FIGURE 9-11: FLORAL HABITAT UNITS

(SOURCE: FLORAL IMPACT ASSESSMENT - SCIENTIFIC TERRESTRIAL SERVICES, 2021)

9.7.2 Alien and Invasive Plants

A total of 13 alien and invasive (AIP) species were recorded. Of the 13 AIPs recorded during the field assessment, six species are listed under NEMBA Category 1b, and was species is listed as NEMBA Category 3. The remaining six species are not listed under NEMBA, but these species are identified as problem plants as they can have a negative impact on the indigenous floral communities within the focus area. Refer to Table 2 below for more information on the AIPs recorded on site.

Although the extent of AIPs within the focus area is low, AIPs can easily proliferate in areas of disturbance. As such, it is recommended that the current invasive alien plan be implemented regularly with follow up during the growing season.

9.7.3 Sensitivity mapping

The National Web-based Screening Tool identified the focus area to be in a low sensitivity area for the Plant Species Theme but in a very high sensitivity area for the Terrestrial Biodiversity Theme (triggering features include Critical Biodiversity Areas (CBA) 1, Ecological Support Areas (ESA) and Freshwater Priority Areas).

Figure 9-12 conceptually illustrates the areas considered to be of varying ecological sensitivity and how they will be impacted by the proposed infrastructure development. The areas are depicted according to their sensitivity in terms of the presence or potential for floral SCC, habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity (compared to a reference type).

TABLE 9-7: FLORA SENSITIVITY ASSOCIATED WITH HABITAT UNITS
(SOURCE: FLORAL IMPACT ASSESSMENT - SCIENTIFIC TERRESTRIAL SERVICES, 2021)

Habitat unit	Habitat Sensitivity
Transformed Habitat Unit	Low
Senegalia Thornveld Subunit	Moderately Low
Seasonal Depressions & Anthropogenic Drainage Line	Moderately Low
Senegalia-Tarchonanthus Thornveld	Intermediate
Calcrete Habitat	Intermediate
Kalahari Thornveld	Intermediate
Mountain Bushveld	Moderately high
Watercourse Habitat	Moderately high

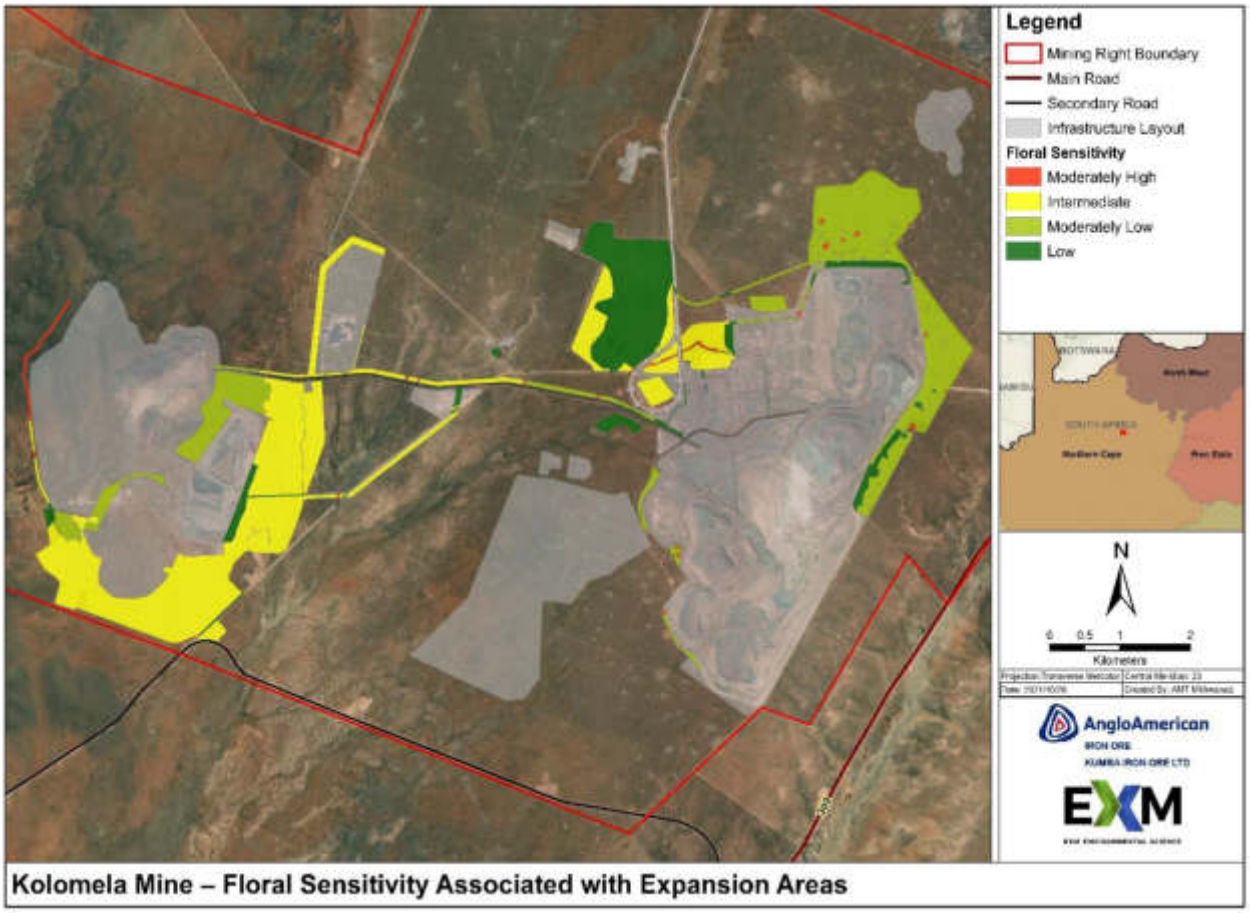


FIGURE 9-12: FLORAL SENSITIVITY MAPPING

(SOURCE: FLORAL IMPACT ASSESSMENT - SCIENTIFIC TERRESTRIAL SERVICES, 2021)

9.8 Biodiversity – Fauna

The following description was derived from the Fauna Assessment conducted by Scientific Terrestrial Services (September, 2021) (Annexure D of Part C). Due to the fact that all current infrastructure areas have previously been assessed by Omni Eko in 2015, the following description focuses on the new areas which will be affected by the expanded activities and infrastructure.

9.8.1 Faunal Habitat

Based on the results of the field investigation in June/July 2021, five broad habitat units were distinguished for the focus area:

***Thornveld Habitat*:** Three subunits were recognised: (*Tarconanthus-Senegalia* Thornveld, *Senegalia* Thornveld and Thornveld Habitat). From a faunal perspective these units comprised of similar mammal, avian and herpetofaunal assemblages. Invertebrate assemblages were hard to determine during the field investigation as it took place during the winter period. These subunits provided good grazing and browsing habitat for most faunal species. The variable habitat structure (trees and shrubs interspersed with grass) offers valuable shelter and foraging

areas. The shrubs and trees provided valuable shelter for birds which were particularly abundant in this unit

Calcrete Habitat: Very little shelter for fauna was noted in this unit. The absence of trees and the lowered abundance reduces the value of this unit for browsers, concurrently limiting the available shelter for larger species. Grazing was abundant in this unit and sufficient biomass was noted for faunal forage.

Moisture driven Habitat:

The **cryptic wetlands and depressions** offer unique habitat for waterfowl, invertebrates and amphibians while providing a water source for all fauna. The drainage lines tend to be more well wooded offering better browsing for herbivores and greater structural diversity which is often favoured by avifauna. Depressions are mostly surrounded by areas of increased bush or tree density with improved cover and browsing. The central portions of the depressions are grass and herb dominated or largely barren only providing limited forage. These habitats support the highest diversity and abundance of avifauna and will also provide valuable habitat for water dependant fauna during high rainfall events.

Mountain Bushveld*:* Reptiles with an arboreal lifestyle as well as those species known to occur in rocky areas will find suitable habitat in this unit. The rocky nature of this habitat unit also provides sufficient burrows and basking locations for reptiles and invertebrates, particularly scorpions. Insects are likely to be abundant within this unit as trees and shrubs flower on mass.

Transformed Habitat*:* These areas do not favour habitation by fauna as a result of the disturbances to the habitat which have reduced forage and shelter availability.

Table 9-8 contains the results of the field as well as the desktop assessment.

TABLE 9-8: ASSESSMENT RESULTS PERTAINING TO FAUNAL SPECIES WITHIN THE FOCUS AREA.

(SOURCE: FAUNAL IMPACT ASSESSMENT - SCIENTIFIC TERRESTRIAL SERVICES, 2021)

Mammals	Avifauna	Reptiles and Amphibians	Invertebrates (Insects and Arachnids)
Mammal diversity within the focus area was considered intermediate. Large mammal diversity is slightly lower that would have been historically observed as megaherbivores and large predators were absent. Small, medium and large sized mammal diversity appeared to be moderately high as most of its historic complement of fauna were observed within the focus area, however, most occur at low abundances and are actively managed. The landscape comprises of five broad floral habitat units, however, from a faunal perspective remains relatively homogenous (thornveld) limiting the habitats available and specialised niche's which would increase faunal diversity. During the field investigation a single SCC, Hippotragus equinus (Roan Antelope), was observed within the Thornveld Habitat, although they have been introduced by the mine this species is endemic to the area. This species as well as Oryx gazelle (Gemsbok) have been brought in and managed on the mining property while the remainder of the mammals observed inhabit the assessment zone naturally. A further five SCC are anticipated to range within the focus area. The condition of the mammals observed looked good indicating that sufficient forage is available for mammals occupying the focus area. Forage availability for primary consumers is considered intermediate due to the arid nature of the region and the reduced primary productivity therein, furthermore, the abundance of mammals will reduce resource availability to a small extent. Forage for small carnivorous mammals like shrews and genets is anticipated to be intermediate. Mesopredators will occur within the study area but large predators were completely absent from the focus area.	During the field assessment *Ardeotis kori* (Kori Bustard, NT) was encountered on two occasions within the focus area. *Gyps africanus* (White-backed Vulture, CR), *Torgos tracheliotos* (Lappet-faced Vulture, EN) and *Neotis ludwigii* (Ludwig's Bustard, EN) have also been recorded within the pentads. Avifauna diversity for the focus area is considered intermediate, as mostly common species were observed during the field assessment. Most avifauna appeared to avoid the Transformed Habitat remaining within the more natural adjacent habitat units. Avifauna diversity appeared to be concentrated in the Thornveld sub-units, the Moisture-driven Habitat and the Mountain Bushveld as the vegetation structure, often considered a primary determinant for bird communities, was more diverse than that of the Calcrete and Transformed Habitats. Ground dwelling birds (bustards, korhaans and coursers) which are anticipated to favour the more open Calcrete and Transformed Habitats were observed more often in the more dense Thornveld subunits. Beyond the mining activities, a large extent of the habitat remains natural providing high integrity locations for avifauna and as such edge effects should be monitored to ensure habitat integrity remains high. A large portion of the focus area where the PV facility (STS 210053) is proposed has been transformed and the limited shelter and forage available largely excludes birds from this habitat. There is, however, good habitat and food availability to support avifauna within the focus area itself, as the intermediate abundance of grasses and insects will benefit granivore and insectivore species.	A low reptile diversity was observed during the field assessment, likely a result of the low winter temperatures. Based on the available databases, atlases, previous reports, food resources and habitat, it is deemed likely that the focus area will be able to support mostly common reptile species. Rodent burrows and those of larger species, which are often utilised by snakes, were observed in low densities, providing limited shelter for burrowing snake species or food resources (rodents). There are likely sufficient levels of food resources for predatory snakes preying on small mammals however herbivorous and insectivorous reptile species are likely to have high resource competition due to the lower levels of available food resources. No amphibians were observed within the focus area during the field assessment. The arid nature of the locality and the absence of permanent watercourses or natural waterbodies reduces the suitability of the site for amphibians. Sensitivity for amphibians is considered to be low as a result of the unsuitable arid landscape and the absence of watercourse or impoundments. No Amphibian or reptile SCC are anticipated to occur within the focus area.	The focus area is considered to have a moderately low invertebrate diversity, as does much of the arid north-western interior. Although the field investigation did take place at the end of winter it is unlikely that a rich assemblage occurs within the general locality. Large portions of the habitat adjacent the proposed activities have been degraded and transformed through earthworks, mining and excavations and offered very little habitat for invertebrates. Areas with bare ground and rock were particularly devoid of invertebrates. Although not particularly rich in flora, the natural habitat within the focus area will support healthy invertebrate assemblages with suitable forage and shelter resources. All baboon spiders of the genus' Ceratogyrus, Harpactira and Pterinochilus are also listed as protected in the TOPS list or as specially protected species under the NCNCA (2009). There is a high possibility that species within the genera Pterinochilus will occur on the site.

9.8.2 Sensitivity mapping

Figure 9-12 conceptually illustrate the faunal ecological sensitivity for the various areas. The areas are depicted according to their sensitivity in terms of the presence or potential for faunal SCC, habitat integrity, levels of disturbance and overall levels of diversity.

TABLE 9-9: FLORA SENSITIVITY ASSOCIATED WITH HABITAT UNITS

Habitat unit	Habitat Sensitivity
Transformed Habitat Unit	Low
Senegalia Thornveld Subunit	Moderately Low
Seasonal Depressions & Anthropogenic Drainage Line	Moderately Low
Senegalia-Tarchonanthus Thornveld	Intermediate
Calcrete Habitat	Intermediate
Kalahari Thornveld	Intermediate
Mountain Bushveld	Moderately high
Watercourse Habitat	Intermediate

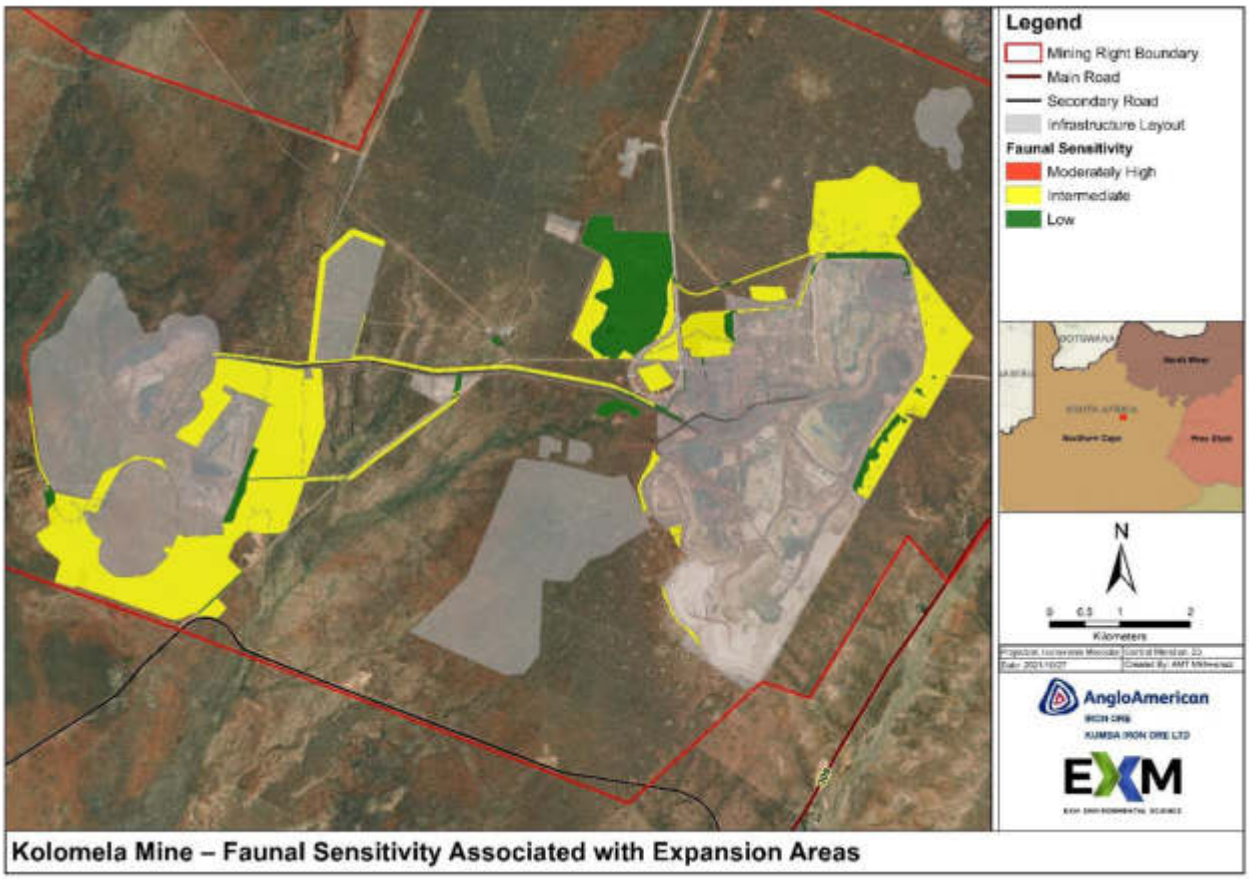


FIGURE 9-13: FAUNAL SENSITIVITY ASSOCIATED WITH AREAS OF ASSESSMENT

9.9 Surface Water Resources

The following description was derived from the Freshwater Ecological Assessment conducted by Scientific Aquatic Services (September, 2021) (Annexure E of Part C).

9.9.1 Characterisation of the Watercourses and Drainage Features

Various factors (i.e. soil characteristics, vegetation) were used for the identification and delineation of wetlands and riparian zones on site. Numerous features displaying visual indicators of increased wetness were investigated during the site assessment and categorised according to their dominant characteristics, primarily topography, vegetation and soil characteristics. Of these features, 75 were defined as "cryptic wetlands", 123 as "seasonal depressions", several episodic drainage lines with riparian vegetation including those associated with a system locally referred to as the Welgevondenspruit and various unnamed tributaries of the Groenwaterspruit, and one extensive preferential flow path (lacking in either wetland or riparian characteristics).

TABLE 9-10: WATER FEATURES ON SITE

PLATE 9-1: CRYPTIC WETLAND

PLATE 9-2: EPISODIC DRAINAGE LINE

TABLE 9-11: CHARACTERISATION OF THE "CRYPTIC WETLANDS" IDENTIFIED WITHIN THE ASSESSMENT AREA, ACCORDING TO THE CLASSIFICATION SYSTEM

Drainage system	Level 3: Landscape unit	Level 4: Hydrogeomorphic Unit
		HGM Type
Cryptic wetlands (CWs)	**Plain:** an extensive area of low relief characterised by relatively level, gently undulating or uniformly sloping land.	**Depression:** a landform with closed elevation contours that increases in depth from the perimeter to a central area of greatest depth, and within which water typically accumulates.
Episodic drainage lines with riparian vegetation	**Valley floor:** The base of a valley, situated between two distinct valley side-slopes.	**River:** a linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water.

Seasonal Depressions were excluded from the definition of a water course due to the species associated with those depressions and the soil characteristics differed between the two types of features, with those in the cryptic wetlands predominantly lacking in chroma whilst the soils in seasonal depressions were generally high-chroma, sandy soils. Several smaller, poorly defined preferential flow paths were identified but not mapped, as they do not meet the definition of a watercourse from an ecological perspective.

The watercourses were grouped as follows:

TABLE 9-12: GROUPING OF WATER COURSES

Watercourse	Description
Episodic drainage line 1	a network of small, episodic drainage lines situated in the far west of the assessment area
Welgevondenspruit system	a network of episodic drainage lines which form part of the network feeding the system locally referred to as the Welgevondenspruit, which ultimately flows into the Soutloop River approximately 9 km south-west of the assessment area
Unnamed tributaries of the Groenwaterspruit	several small episodic drainage lines located to the east of the existing mining activities which flow into the Groenwaterspruit, located approximately 1 km east of the assessment area
Cryptic Wetland 1 (CW 1)	an isolated cryptic wetland in the west, which will be traversed by the proposed conveyor to the Kapstevel At-pit
Cryptic Wetland 2 (CW 2)	located approximately 200 m to the west of the existing ore stockpile area, this wetland was assessed separately as it is clear that the modifiers to this wetland are slightly different to those of the other wetlands
Cryptic Wetlands Group 3, comprising CWs 3 to 10, 16 to 20, and CW 23	These are located to the west of the existing ore stockpile area and open pit (which will in due course be the Klipbankfontein Backfill Area)
Cryptic Wetlands Group 4, comprising CWs 29, 30, 32, 33 and 34 (CW 34 is also known locally as Leeuwpan)	located to the east of the existing open pit

Watercourse	Description
Cryptic Wetlands Group 5, comprising CWs 35, 36, 38, 39, 40, 41, 44, 46 to 53, 62, 65, 67 and 72.	These are situated to the north-east and north-west of the existing open pit, which will in time become the Leeuwfontein north WRD (already approved) and DMS TSF, and are also associated with the proposed 35 m rehabilitation buffer around the approved Leeuwfontein North WRD expansion and the eastern portion of the proposed railway option
Cryptic Wetland 55	this wetland is located on the eastern boundary of the existing pit and was assessed separately as it was clear from historical digital satellite imagery that it has been compromised to a greater degree than the other wetlands

9.9.2 Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS)

The Present Ecological State was determined by using various indices and factors such as Hydrology, Geomorphology, Vegetation, ecological services were taken into account. Ecological Importance and Sensitivity (EIS) was determined by taking into account the biodiversity support, landscape scale and sensitivity of the wetland. The Table below contains a summary of the PES and EIS assessments applied to the cryptic wetlands and episodic drainage lines. The details regarding the PES and EIS is provided on pages 39 to 46 of the Freshwater Ecological Assessment.

TABLE 9-13: SUMMARY OF THE PES AND EIS ASSESSMENTS APPLIED TO THE CRYPTIC WETLANDS. (REFER TO FIGURE 9-13)

Watercourse Grouping	PES Category	EIS Category
CW 1	B (1.08)	High
CW 2	B (1.57)	High
CW Group 3	B (1.08)	High
CW Group 4	B (1.26)	High
CW Group 5	B (1.11)	High
CW 55	D (4.71)	High
EDL 1 (western portion of assessment area)	B / C	Moderate
Welgevondenspruit system	B / C	Moderate
Unnamed tributaries of the Groenwaterspruit	B / C	Moderate

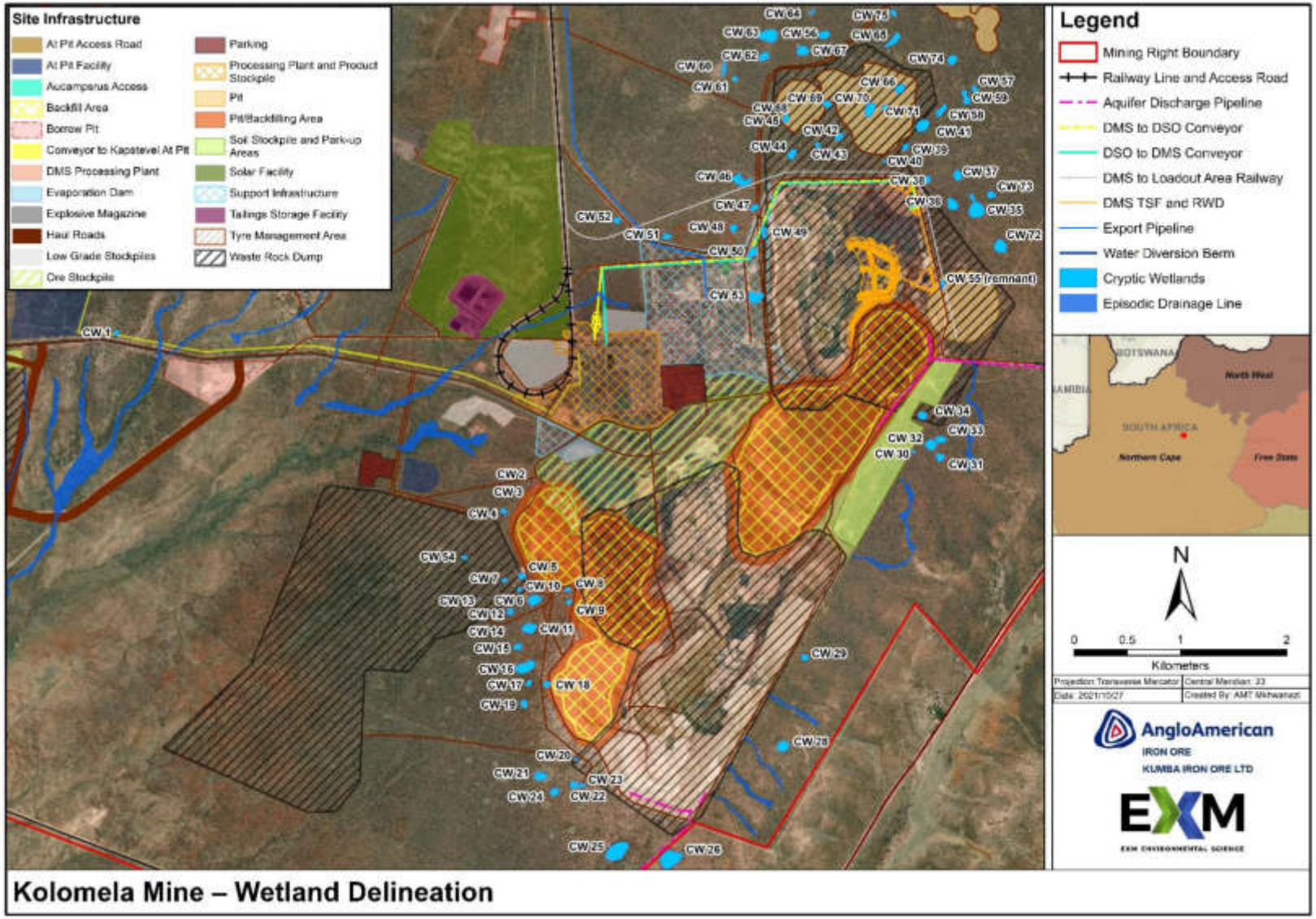


FIGURE 9-14: DELINEATED WATER COURSES

Source: Freshwater Ecological Assessment (Scientific Aquatic Services, 2021).

9.10 Soil and Hydropedology

According to the Hydropedology Assessment (Zimpande Research Collaborative, 2021) (Annexure D – Part C), the structure of the soils associated with the investigation area as sandy with loose and single grained structure. A calcrete layer is present at shallow depth within most part of the landscape and is deemed to have a moderate impermeability with a moderate to good water holding capability. The Cryptic wetlands however do not hold water long enough to create soil morphological properties indicative of prolonged saturation as the evaporative demand is greater than the water residence time within these features. Infiltration rates on the shallow soils underlined by the permeable fractured bedrock is anticipated to be very high due to large cracks present in the bedrock and thereby recharging the regional aquifers.

The identified soils with the investigation area have been grouped into hydropedological soil types and are discussed below in order to understand their contribution to wetland recharge. The subsections below present the hydropedological soil types which were identified within the investigation area during the site assessment.

9.10.1 Recharge (Shallow) soils

Characterised by the absence of any morphological indication of saturation. In this instance these soils are mostly shallow underlined by a fractured bedrock. For this study the soils in question are Nkonkoni and Glenrosa forms. These soils are characterised weak structured and mostly sandy textured properties which allows for rapid infiltration of water. Below the soil material the presence of lithic material in the form of fractured rock still allows for percolation of water and thus the dominant hydrological pathway for these soils is vertical through and out the profile into the underlying aquifers. Therefore, these soils are referred to as recharge soils, as they are likely to recharge groundwater, or lower lying positions in the regolith via bedrock.

9.10.2 Stagnating Soils

The soils in the investigation area can be classified as shallow stagnating for soil forms such as Coega and deep stagnating for soil forms such as the Kolke soil form. The Coega soil form is characterised by the presence of a hard plinthic horizon underlying the Orthic A horizon. Whereas the Kolke soil form is characterised by the presence of a soft carbonate and material with signs of wetness underlying the Orthic A horizon. In both these soils outflow of water is limited or restricted due to the underlying impeding layer. The A and/or B horizons are permeable but morphological indicators suggest that recharge and interflow are not dominant. The solubility of lime in water makes it an important indicator of water accumulation in the landscape because it dissolves due to leaching and precipitates where water

evaporates. This phenomenon was observed in the Kolke soil forms where the presence of lime precipitates dominated the soil profile and these soils were observed more on depressional areas or wetlands. Both soils are frequently observed in climate regions with a very high evapotranspiration demand and the dominant hydrological flow path in the soil is upward, driven by evapotranspiration.

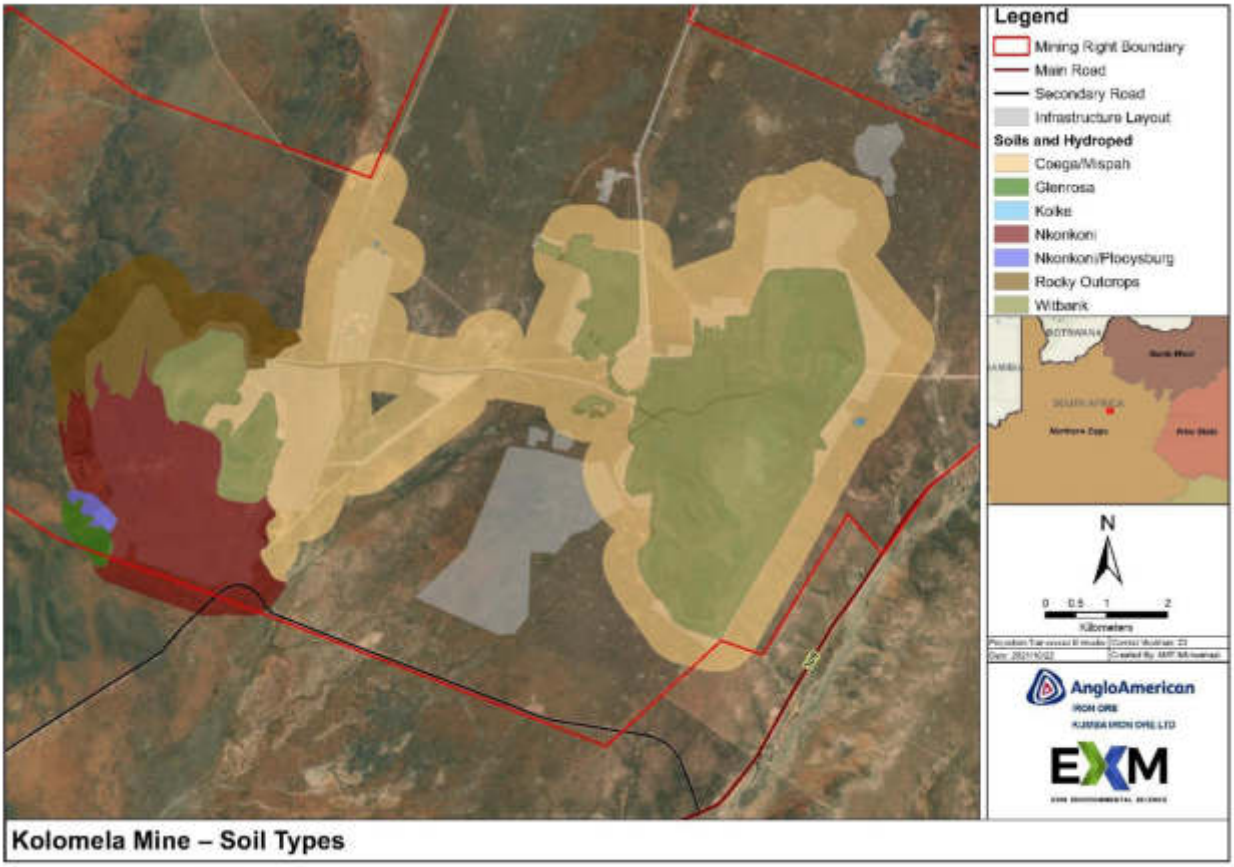


FIGURE 9-15: KOLOMELA MINE SOIL TYPES

(SOURCE: HYDROPEDOLOGICAL ASSESSMENT – ZIMPANDE, 2021)

9.11 Groundwater

9.11.1 Aquifers

The groundwater description has been sourced from the assessment undertaken by Gradient Consulting (September 2021) (Annexure I – Part C)

9.11.2 Groundwater levels

Annual water monitoring data from Aquatico Scientific (Pty) Ltd (Aquatico) has been sourced and utilised as part of the study.

The groundwater levels remained relatively constant throughput the monitoring period, with the exception of aquifer recharge and dewatering boreholes. Average groundwater levels range from 5.4 to 21.1 metres below ground (mbg); and despite the close proximity of some boreholes to the open pits, generally shallow and stable water levels were observed.

Boreholes at Leeuwfontein have much deeper groundwater levels due to dewatering with average water levels here exceeding 100 mbg. Three boreholes from the Kapstevel (KS) cluster are believed to be drilled into the same aquifer, as are those in the Welgevonden (WV). On the other hand, boreholes in the Leeuwfontein (LF) cluster are clearly drilled into different aquifers or fracture systems with three markedly different water levels.

A number of boreholes display decreasing water level trends in recent years with some exceptions where increasing water levels were observed. This may be attributed to a combination of factors i.e. persevering drought conditions, mine dewatering and aquifer recharge.

9.11.3 Hydrochemistry

Kolomela has a comprehensive groundwater and surface water monitoring network, for which Aquatico has groundwater quality and groundwater level results dating back to 2008. This data was reviewed and summarised to understand historical and current water quality status and trends for Kolomela mine and the surrounding farms.

The latest monitoring results were used to conceptualise the site which are summarised below for the 2020 monitoring period include:

- Process water at Kolomela mine has a neutral to alkaline, very hard profile with pH, total dissolved solids (TDS), calcium, magnesium, sodium and sulphate exceeding the WUL limits;
- The receiving environment has a neutral, very hard profile, also with TDS, calcium, magnesium, sodium and sulphate exceeding the WUL limits in some of the boreholes;
- At Klipbankfontein magnesium exceeded the WUL limits in one (1) borehole and at Leeuwfontein magnesium (two boreboreholes), chloride (one borehole) and total coliforms (one borehole) exceeded the WUL limits;

- At Kapstevel no variables exceeded the WUL limits whereas at Welgevonden only one borehole had elevated levels of total coliforms whereas no constituents were found to be elevated at Moolmans Farm;
- The boreholes at Kapstevel pit had average magnesium concentrations of 56.8 mg/ℓ, TDS (521.7 mg/ℓ), nitrate (3.6 mg/ℓ) and chloride (22 mg/ℓ);
- Average concentrations for the boreholes located around the plant were 54.4 mg/ℓ (magnesium), 529.8 mg/ℓ (TDS), 3.2 mg/ℓ (nitrate) and 100.3 mg/ℓ (chloride);
- At the slimes dams the average concentrations were 65.2 mg/ℓ (magnesium), 523.3 mg/ℓ (TDS), 1.5 mg/ℓ (nitrate) and 255.3 mg/ℓ (chloride);
- For the Kappieskaree recharge boreholes the average concentrations were 65.6 mg/ℓ (magnesium), 570.8 (TDS), 1.7 mg/ℓ (nitrate) and 79.4 mg/ℓ (chloride);
- The Klipbankfontein recharge boreholes average concentrations were 88.8 mg/ℓ (magnesium), 656.5 mg/ℓ (TDS), 3.5 mg/ℓ (nitrate) and 83.6 mg/ℓ (chloride);
- The Leeuwfontein aquifer recharge boreholes had average magnesium concentrations of 82.8 mg/ℓ, TDS of 592.9 mg/ℓ, nitrate of 3.2 mg/ℓ and chloride of 43.2 mg/ℓ;
- A number of variables in the aquifer recharge boreholes exceeded WUL limits including, pH (most localities), electrical conductivity, alkalinity (many locations), magnesium (most localities) and manganese (certain localities);
- The deep aquifer monitoring boreholes had average magnesium concentrations of 23.2 mg/ℓ, TDS 3205 mg/ℓ, nitrate 1.5 mg/ℓ and chloride 19.8 mg/ℓ. The deep aquifer boreholes that are used to monitoring dewatering impacts all have good water qualities not exceeding any of the guidelines.
- The water fill points (dust suppression) have very high salt and organic contents.

9.11.4 Geochemistry

Loubser Water Resources Consult (LWRC) **(Annexure L of Part C)** conducted a geochemical assessment and waste classification (Annexure in 2021 to determine the chemical nature and character of the waste rock dump (WRD) and tailings storage facility (TSF) material and to determine their pollution generating potential (including AMD / ARD). These results were then compared against results of previous geochemical assessments undertaken at Kolomela Mine.

The results from the studies largely agree on the mineralogy, ABA and the observed total concentrations (TC's) and leach concentrations (LC's). The mineralogy of the waste rock and tailings is dominated by silica (quartz), ferric oxide (hematite), aluminium oxide and dolomite. In terms of acid generating potential all studies agree that the potential is low to zero for the waste rock or tailings material. The TC's are also similar in the studies in that the elements observed to exceed total concentration threshold (TCT) values are mostly barium, copper

and manganese, while the LC's are observed to be similar as well. The investigations all classed the waste rock and tailings as Type 3 Waste (low risk).

Golder Associates (2016) concluded that none of the base (model) scenarios for the Waste Rock Dumps final profiles have LC > LCT0, but all have at least one TC > TCT0 – thus whilst they are not Type 4 waste, they do not meet the complete definition of Type 3 waste (LC > LCT0 so low risk from leachable concentrations) and this indicates that it is reasonable to consider not applying a Class C barrier system, which is prescribed for Type 3 waste.

9.11.5 Site hydrogeology

No site characterisation work was conducted as part of the Gradient (2021) hydrogeological assessment, and the findings were therefore inferred from previous hydrogeological assessments and groundwater models conducted at Kolomela Mine and surrounding areas.

9.11.6 Groundwater Gradients and Flow

The groundwater flow directions are indicated in the figure below. It is observed that groundwater flow is generally towards the south and southwest.

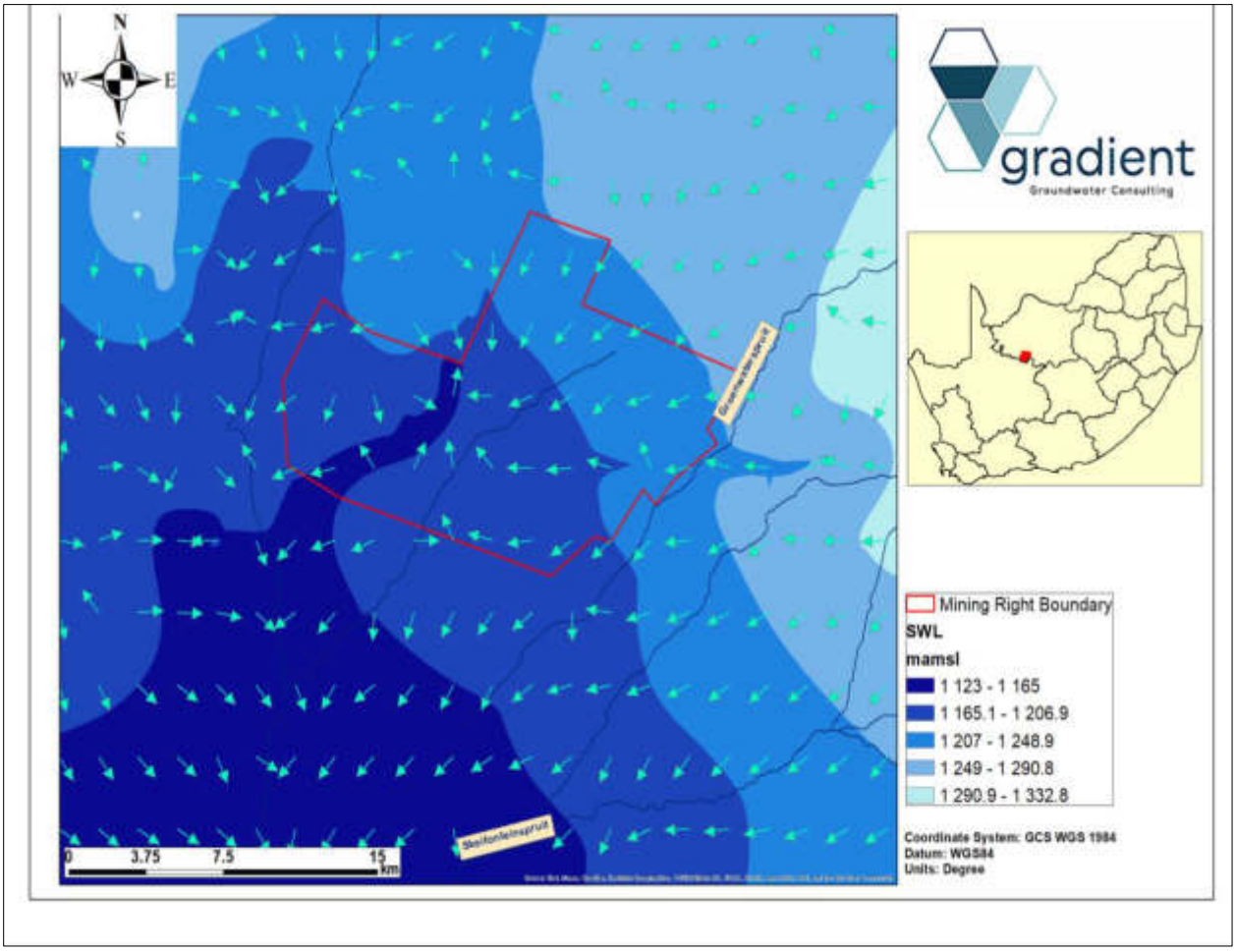


FIGURE 9-16: GROUNDWATER FLOW DIRECTION
(SOURCE: GEOHYDROLOGICAL ASSESSMENT - GRADIENT, 2021)

9.11.7 Aquifer Type

There are two main aquifers that are typically present in the project area. These are:

The first, upper, unconfined to semi-confined aquifer, comprising mainly of Kalahari Formation calcareous sand and silt which extends down to the more competent calcretes. The calcretes retards groundwater flow and groundwater recharge because of its low permeability. Yields from calcrete are low, exceptions are around Groenwaterspruit (east) and Lucasdam Vlei (West) both low lying drainage areas with higher recharge due to seepage and increased hydraulic conductivity due to paleo channels comprising of coarse gravels. In certain places, water strikes also occur on the contact between the calcretes and underlying clays.

A deeper, unweathered fractured rock (second porosity) aquifer, is the major aquifer system within the Transvaal/Griqualand West sequences where water occurrence is mainly within fissures and fractures in the brecciated BIFs where mineralization and preservation of ore bodies occurred through folding, thrusting, fracturing and sinkholes. Yields can vary from 1 – 80 ℓ/s. Inherently, these types of aquifers are heterogeneous and aquifer parameters are variable. The Ongeluk Formation is generally considered to be a low-yielding aquifer.

A dolomitic aquifer is also found in which water occurrence is mostly restricted to karstic compact carbonate rock. Exploration in the dolomites indicated yields of 2 – 4 L/sec, however yields of up to 80 L/s have been recorded.

In addition to the two main aquifer systems, temporary perched, riverbed aquifers are also found which are located in the riparian zone surrounding the drainage lines and rivers. This primary alluvial sand aquifer is directly recharged during rainfall events and is limited to a zone of variable width and depth, largely determined by the depth and extent of the calcrete and pebble beds. From the local groundwater levels and subsurface lithology it is assumed that this aquifer only contributes to river flow directly following significant rainfall events.

TABLE 9-14: AVERAGE AQUIFER DEPTHS

Aquifer	Depth (mbg)	Geology
Intergranular Unconfined	0 - 40	Aeolian and calcareous sand underlain by competent calcrete and a pebble marker in places
Fractured confined	40 - 300	Unweathered hard rock Dwyka, BIFs, Ongeluk Lavas

9.11.8 Aquifer Classification and Vulnerability

Based on the aquifer extents and yielding potential of the aquifers the shallow, unconfined (upper) aquifer is regarded as a minor aquifer system as well as non-aquifer systems where yield is negligible. The lower, fractured aquifer is predominantly also regarded as a minor aquifer system. It might yield more groundwater in places as hydrogeological conditions are variable across the study area.

An additional variable classification is needed for sound decision making and therefore, the vulnerability of the aquifer to contamination is used as an additional parameter. (Please refer to Section 4 of the Geohydrologcal Report for calculations) Based on the calculations made above, the intergranular aquifer has a DRASTIC score of 184, as a result of the higher porosities above the calcretes as well as the shallow groundwater levels (vulnerable to contamination). As such it is deemed as most susceptible to contamination in times that it yields groundwater. The fractured aquifer has a DRASTIC score of 85 and is therefore least susceptible to contamination, mostly as a result of the depth to groundwater level as well as the tight fractured rock formations. The dolomitic aquifers have drastic ratings of 107

After rating the aquifer system management and the aquifer vulnerability, the points are multiplied to obtain a Groundwater Quality Management (GQM) index. Based on the above, the aquifers at Kolomela operations are classified in Table 4.i below.

The above classification indicates that all aquifers at Kolomela Mine classify as minor-aquifer systems as a result of their low exploitable potential. As such, medium level protection is required.

9.12 Cultural Heritage

9.12.1 Heritage

A Heritage Impact Assessment was conducted by PGS Heritage (August, 2021) (Annexure F1 of Part C) for the entire Kolomela mining area. The report included heritage sites previously identified as well as sites in proximity of the proposed expansion activities, as illustrated in the Map (Figure 9-16) below and summaries in the subsequent Table below.

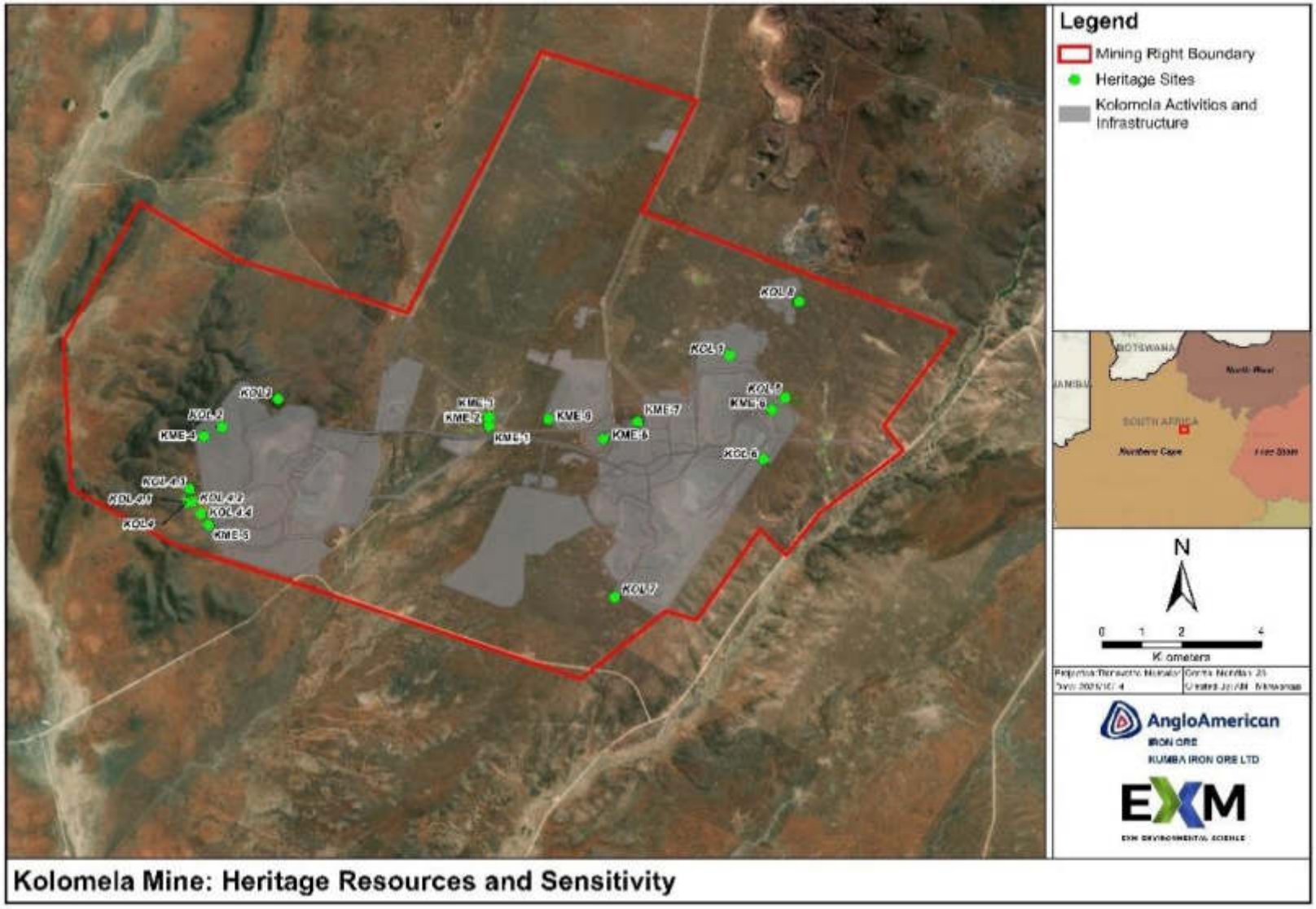


FIGURE 9-17: IDENTIFIED HERITAGE SITES

(SOURCE: HERITAGE IMPACT ASSESSMENT – PGS, 2021)

TABLE 9-15: SUMMARY OF HERITAGE RESOURCES

(SOURCE: HERITAGE IMPACT ASSESSMENT – PGS, 2021)

Site	Description	Significance
KOL 1 Stone Age Site	Represents a number of shallow pans located on the farms Leeuwfontein and Ploegfontein. These pans are all roughly 100 to 200 m in diameter. The stone artefacts are mainly of Middle Stone Age typology.	A **Low-Medium Significance** has been assigned to this site in view of the relative densities of the lithics.
KOL 2 Stone Age Site	KOL 2 is a Stone Age site on the Remainder of the farm Kapstevel. The site comprises a scatter of possibly LSA artefacts observed on a colluvial fan in one of the valleys.	Morris did not provide an assessment of significance of this site. Van der Ryst (2011) provided a general significance assessment for the low-density or isolated occurrences of stone tools on the plains. The areas were assessed to be of **Low Significance.**
KOL 3 Historic Mine	The open-mine workings of haematite consist of a narrow trench with two stopes on the highest section. It has been estimated that 3 000 to 4 000 tons of haematite ore could have been removed. The backfilling of the excavation obscures details such as possible tunnels (van der Ryst, 2011).	The site is of **High Significance**. The mine is an important feature that documents the history of mining and ore extraction within the study area as well as within the broader region.
KOL 4.1 Farmyard	The farmyard comprises a main dwelling, a wagon shed, kitchen with bakery extension, a school, a power generation shed, a cold room and various early 20th century farming tools. The original dwelling, barn and outer kitchen were built at the beginning of the 20th century. During the 1920s the main house was extended and it would appear that the school was added at this time.	As it comprises structures older than 60 years, **the farmyard enjoys general protection under the provision of Section 34 (1) of the NHRA**. Furthermore, sections of the farmyard are also believed to be older than 100 years and as a result these buildings are defined as archaeological sites and as such are protected by Section 35 (4).
KOL 4.2 Cemetery	A cemetery of the Bredenkamp family is located roughly 160 m east of the farmyard. The graves are divided into parallel rows and are all covered by formal dressings and all have inscribed headstones. The cemetery comprises the graves of 12 members of the Bredenkamp family. One of the oldest graves in the cemetery dates to 1893.	All graves are automatically assigned a **High Significance** as they are protected by general legislation regarding human remains, as well as the National Heritage Resources Act. This High significance is emphasised by the fact that the cemetery is associated with the historical owners of the farm as well as the fact that graves inherently have high levels of emotional, historic, religious and scientific value.
KOL 4.3 Valley dams	The main landscape features associated with the farmyard are situated to the north-east of the dwelling and comprise two generations of valley dams that are typical of water storage in this region, together with associated irrigation fields.	The significance of these features is related to the fact that they form part of a larger overall farmstead complex, the individual components of which have been retained from the nineteenth century to the present day. The significance is assessed as being **Medium-High**.
KOL 4.4 Cemetery	A cemetery which can be associated with nearby farm worker accommodation was identified south-east of the farmyard. It consists of approximately 30 graves.	All graves are automatically assigned a **High significance** as they are protected by general legislation regarding human remains, as well as the National Heritage Resources Act.

Site	Description	Significance
KOL 5-8	KOL 5-8 represent cluster pans identified 2011. Most of these pans have been impacted by mining activities or will be impacted by authorised expansions	These pans can be assumed to have similar significance to that noted by both Morris (2005) and van der Ryst (2011) for the pans that were investigated during the fieldwork for their respective reports. All of these pan localities are assigned a **Low to Medium Significance.**
KME-01 Burial ground	The site comprises a burial ground of approximately 9 graves. The graves are fenced off and overgrown.	High Significance
KME-02 Structure	The site comprised an abandoned single roomed structure. The construction materials and technique are consistent with modern building methods. It was constructed from red clay bricks and has a cement foundation.	No research potential or other cultural significance.
KME-03 Structure	The site comprised an abandoned single roomed structure. The structure was situated approximately 60m north-west of the current exploration core yard area. The construction materials and technique are consistent with modern building methods. It was constructed from red clay bricks and has a cement foundation.	No research potential or other cultural significance.
KME-04 Stone Age Site	The site comprises a low-medium density surface scatter of stone tools (+-5-10 artefacts in 10mx10m). The site is situated on a scree slope near the base of the Wolhaarkop hill, within the proposed Waste Rock Dump area. The tools were located on a surface that gently sloped towards the east. Mostly MSA and LSA artefacts were observed at KME-04. Cores, flakes, scrapers and debitage were observed and were mostly manufactured from jasper, cryptocrystalline silica and quartz	Low
KME-05 KME-06 KME-07 KME-08 KME-09 Stone Age find spots	More than 5 identifiable modified lithics were observed within a 5-metre radius. Sparse scatters of lithics consisting mainly of flakes, debitage and cores.	No research potential or other cultural significance

9.12.2 Palaeontology

The Palaeontological Impact Assessment (PIA) (Annexure F2 of Part C) stipulates Kolomela is underlain by Quaternary aged sediments of the Kalahari Group as well underlying Griqualand West Basin rocks. According to the PalaeoMap of South African Heritage Resources Information System the Palaeontological Sensitivity of the Kalahari Group low but locally high and that of the Griqualand West rocks of the Transvaal Supergroup is moderate.

Several Palaeontological site investigations have been conducted since 2019 on the Kolomela Mining area. In each case no fiossilifeous outcrops were identified and thus a desktop study has been conducted for the present study. The general low palaeontological sensitivity of the bedrocks and superficial sediments in the proposed development footprint, indicates that the proposed development will have a overall Low impact significance in terms of palaeontological heritage. It is therefore considered that the development is will not lead to detrimental impacts on the palaeontological resources of the area.

9.13 Socio-Economic Environment

Kolomela mine is located in the Tsantsabane Local Municipality within the ZF Mgcawu District Municipality. According to Naude (2020), mining and agriculture have been coexisting in the Tsantsabane area for many years as the main economic sectors, although mining has become more prominent in recent years. The Kolomela and Beeshoek Iron Ore mines are the most prominent mines in the immediate area. Some of the smaller, newer mines close to Postmasburg have also recently been developed.

The energy sector is becoming more prominent with at least three major green energy projects being established in the Tsantsabane municipal area – Redstone Solar Thermal Power, Jasper Solar Energy and Lesedi Solar Park.

The nearest large business centre is Kimberley, approximately 200 km away, but with a number of newly built shopping centres in Kathu, Tsantsabane residents do most of their business in Kathu which is 92 km away. Many persons working in Postmasburg also have chosen to reside in Kathu and commute to Postmasburg. This is motivated by better recreational opportunities and access to retail outlets, restaurants, health care and schools Kathu.

9.13.1 Public Services and Infrastructure

There is distinct lack of facilities and amenities in Tsantsabane (for sport, recreation, leisure, healthcare) which results in residents having to frequently travel to other towns and cities in the region. Access to basic services in Tsantsabane has improved gradually since 2001. However, between 2014 and 2019 there was a drop in the percentage of households with access to the services displayed below. The lower number can be attributed to a sharp increase in informal settlements (as explained earlier), as well as service delivery pressures on

the Tsantsabane Local Municipality.

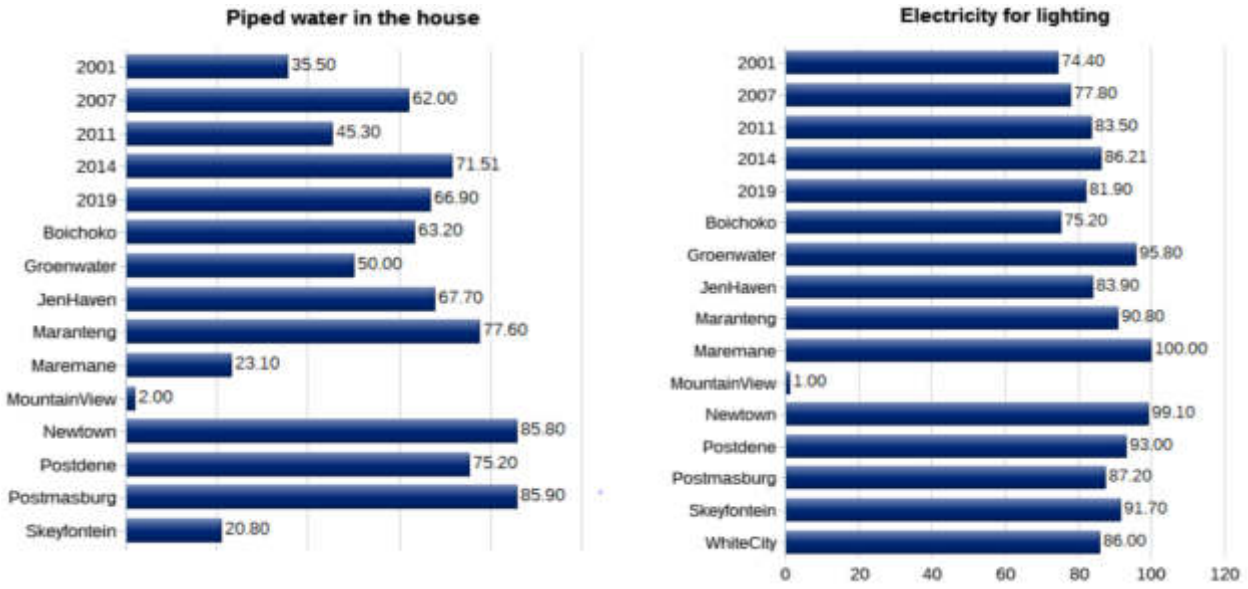


FIGURE 9-18: PIPED WATER IN HOUSES AND ELECTRICITY FOR LIGHTING PER AREA

9.13.2 Access to basic services

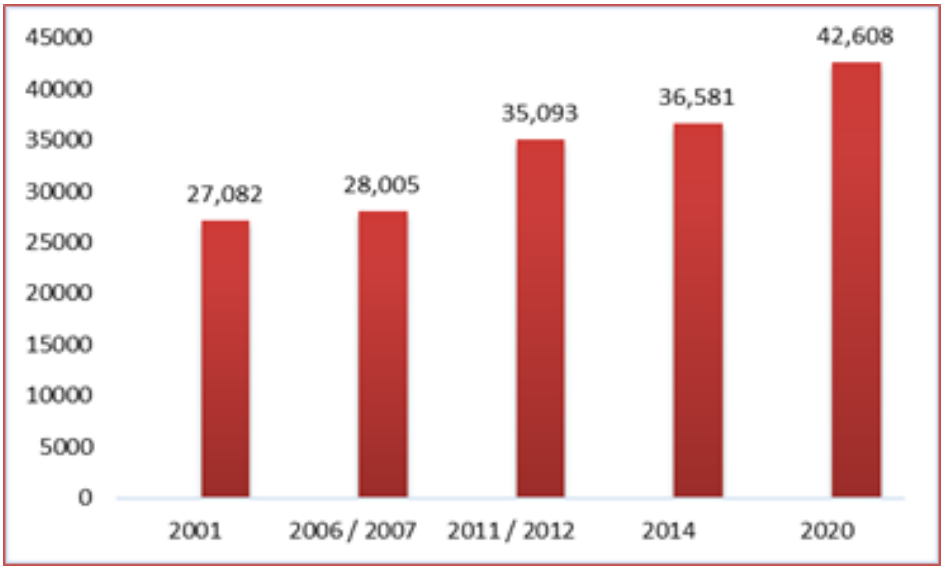
Access to basic services in Tsantsabane has improved gradually since 2001. However, between 2014 and 2019 there was a drop in the percentage of households with access to the services. The lower number can be attributed to a sharp increase in informal settlements, as well as service delivery pressures on the Tsantsabane Local Municipality. Rural areas such as Groenwater, Maremane, Skeyfontein and Jen Haven do not have access to proper refuse removal services many households do not have access to proper sanitation.

Infrastructure in Tsantsabane is in a poor condition. Tar roads are full of potholes and gravel roads are not being maintained. Bulk infrastructure is old and not able to endure the pressure of a rapidly increasing population. Water and electricity interruptions happen frequently.

9.13.3 Population and demographics

The population in the Tsantsabane municipal area has increased significantly since 2001. The population estimate for 2020 according to Stats SA, is 57% higher than in 2001. The population increase can be attributed to the increased economic activity due to mining development.

Even though Kolomela mine's presence is not the only contributing factor to population growth, the mine is generally viewed as the biggest "pull factor" for job seekers. Almost three quarters of participants in the 2019 community baseline survey (73%) indicated that Kolomela mine is seen as a key reason for rapid population growth in Tsantsabane. Any project undertaken by Kolomela mine will result in community expectations of employment by the growing population. There is also the increased potential for site-induced migration.



(Source: Social Impact Assessment (Naude, 2020))

FIGURE 9-19: TSANTSABANE POPULATION GROWTH

9.13.4 Unemployment

The employment rate for adults is low, with only 33% employed full-time, 16% part-time and 2% self-employed, bringing the employment rate to 51%. The unemployment rate is at 39%, which is significantly higher than the national average of 29%. Low education and skills levels among adults described earlier, contribute to a low employment rate for the area.

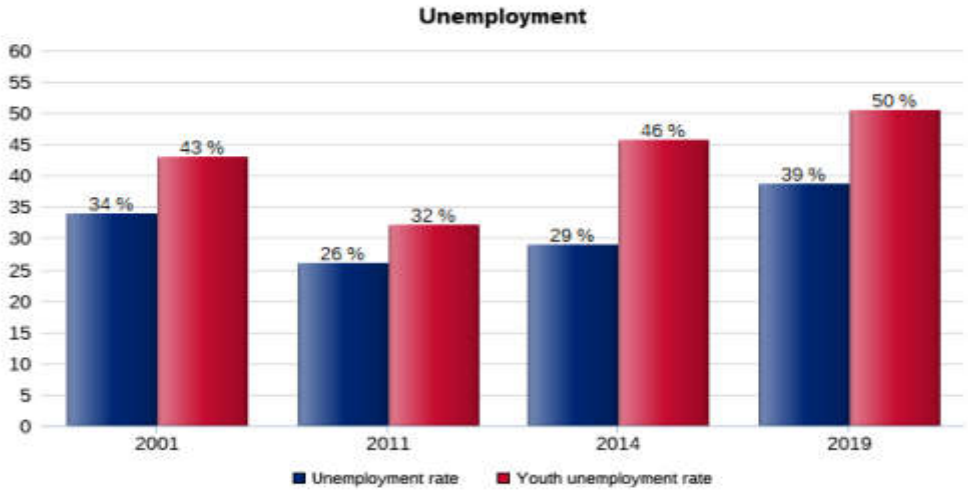


FIGURE 9-20 COMPARISION OF UNEMPLOYMENT OVER TIME FOR ADULTS AND YOUTH IN TSANTSABANE

The unemployment rate declined between 2001 and 2011, with the arrival of Kolomela mine. But from 2014 the unemployment rate started to rise again, as a result of an influx of job seekers to the area and with the construction of the mine coming to an end in 2012. Youth unemployment (adults of 35 years old or younger) showed the same trend, but at much higher rates. The youth unemployment rate was at 50% in 2019, a very concerning statistic, especially given the low number of learners who passed Grade 12 at one of the high schools and the lack of post-school training among the youth. The national youth unemployment rate was at an all- time high in the third quarter of 2019, at 58.2% - which provides some perspective on the unemployment rate among the Tsantsabane youth.

9.13.5 Education and skills

Education and skills levels in Tsantsabane is low. Only 53% of the Tsantsabane adult population have passed Grade 12. People that have some skills due to being employed at some time, however, lack formal certification and training and as such are not employable. There is thus a distinct lack of semi-skilled candidate for employment within the Tsantsabane community.

9.14 Land Tenure

The properties within the Kolomela mining right area as well as several outside properties are owned by SIOC. The Figure below shows the property details as well as the land ownership.

FID	SG Code	Farm Name	Portion	Owner	FID	SG Code	Farm Name	Portion	Owner
1	N085C03100000000000607000000	Klipbanksfontein 607	607	BREDENKAMP DEITLIEF CHRISTIAAN	21	N085C03100000000000544000001	Farm 544	RE/544	HENQUE 4362 CC
2	N085C03100000000000490000001	Kameel fontein 490	RE/490	ZYL JOHAN DE KLERK VAN	22	N085C03100000000000543000040	Farm 543	4/543	COETZEE JOHANNA MARIA
4	N085C03100000000000537000001	Waterstroom Vley 537	RE/537	S & L VERMEULEN FAMILY TRUST	24	N085C03100000000000583000040	Bermolli 583	4/583	LAMBRECHTS PIETER JOHAN VAN DER BYL
5	N085C03100000000000537000040	Waterstroom Vley 537	4/537	PLOOY ALETTA MARIA MAGTELENE DU	25	N085C03100000000000543000050	Farm 543	5/543	VILJOEN CHARL FRANCOIS
6	N085C03100000000000537000050	Waterstroom Vley 537	5/537	PLOOY ALETTA MARIA MAGTELENE DU	26	N085C03100000000000585000000	Watervlak 585	585	SNIJMAN HENNIE TJAART
7	N085C03100000000000537000070	Waterstroom Vley 537	7/537	WILLIE LANGBERG TRUST	28	N085C03100000000000543000001	Farm 543	RE/543	KLERK TOBIAS GERHARDUS DE
8	N085C03100000000000538000001	Farm 538	RE/538	MERWE JOHANNES CHRISTIAAN VAN DER	29	N085C03100000000000606000000	Soetfontein 606	606	VILJOEN FAMILIE TRUST
11	N085C03100000000000540000010	Kappies Kareeboom 540	1/540	PLOOY ALETTA MARIA MAGTELENE DU	30	N085C03100000000000474000001	Kalkfontein 474	RE/474	VAN DER WALT ANDRIES JOHANNES
12	N085C03100000000000569000010	Boschpoort 569	1/569	POSTMASBURG BOSPOORT BOERDERY PTY LTD	31	N085C03100000000000431000001	Farm 431	RE/431	NORTHWEST DIAMOND CO PTY LTD
13	N085C03100000000000402000001	Lucas Dam 402	RE/402	LUCASDAM BOERDERY PTY LTD	33	N085C03100000000000475000020	Olynfontein 475	2/475	VILJOEN CHARL FRANCOIS
14	N085C03100000000000479000001	Farm 479	RE/479	BREDENKAMP BENJAMIN PHILIPPUS	34	N085C03100000000000475000040	Olynfontein 475	4/475	ASSMANG PTY LTD
15	N085C03100000000000479000010	Farm 479	1/479	BREDENKAMP BENJAMIN PHILIPPUS	35	N085C03100000000000448000001	Beesthoek 448	RE/448	ASSMANG PTY LTD
16	N085C03100000000000480000001	Farm 480	RE/480	RPB ANERI TRUST	36	N085C03100000000000447000000	Farm 447	447	ABRAHAM WILLEM ADRIAAN VAN WYK TESTAMENTARY TRUST IN FAVOUR OF A
17	N085C03100000000000483000001	Farm 483	RE/483	RPB ANERI TRUST	40	N085C03100000000000543000020	Farm 543	2/543	HUMAN REGINA JOHANNA
18	N085C03100000000000431000010	Farm 431	1/431	RUFCO ENGINEERING CC	43	N085C03100000000000230000001	Farm 230	RE/230	FLORADALE BOERDERY CC
19	N085C03100000000000060000020	Watervlakte 60	2/60	HENNIE TJAART SNIJMAN TESTAMENTERE TRUST	44	N085C03100000000000542000010	Farm 542	1/542	FLORADALE BOERDERY CC
20	N085C03100000000000061000001	Gras Vlakte 61	RE/61	SNYMAN TJAART JOHANNES	48	N085C03100000000000484000001	Farm 484	RE/484	FLORADALE BOERDERY CC

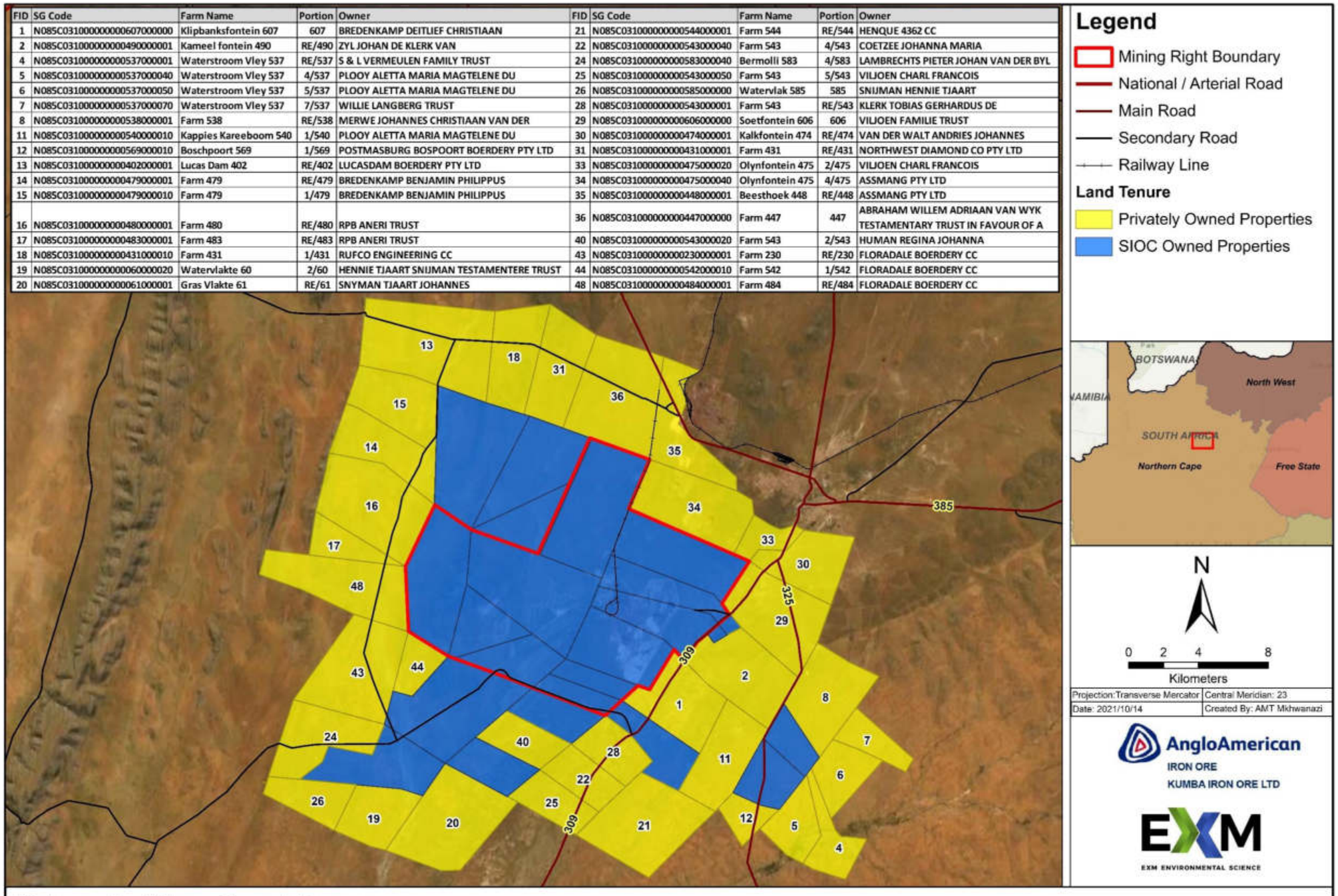


FIGURE 9-21: KOLOMELA LAND TENURE MAP

9.15 Description of current land use and services infrastructure

9.15.1 Land use within mining right area

Table 9-17 contains the current and future land use activities conducted on the properties within the Kolomela mining right area for which authorization has been obtained.

TABLE 9-16: LAND USE WITHIN KOLOMELA MINING RIGHT

Property	Owner	Current Land Use
Mining Right Area		
Ploegfontein 487	SIOC	Livestock Farming, Game Farming, Dewatering Pipeline, Railway, Access Road, Power Line (supplying Kolomela), Prospecting Laydown Area, Prospecting.
Rem Leeuwfontein 488	SIOC	Leeuwfontein Pit, Tierbult DMS Plant, Leeuwfontein North Waste Rock Dump, Haul Roads, Access Road, Dewatering Pipeline, Power Line, Railway Line, Stormwater Management Infrastructure, Groenwaterspruit Aquifer Recharge, Game Farming.
Strydfontein 614	SIOC	Leeuwfontein Pit, Leeuwfontein North WRD, DSO Processing Plant, Workshops, Offices, Parking, Fuel Storage, Product Stockpile Area, Pollution Control Dams, Water Supply Dams, Construction Village, Sewage Treatment Works, Bioremediation Facility, Waste Disposal Site, Waste Storage Site, Slimes Dam, Borrow Pits, Haul Roads, Internal Roads, Stormwater Management Infrastructure, Game Farming.
Rem Klipbankfontein 489	SIOC	Klipbankfontein Pit. Leeuwfontein Pit, Leeuwfontein South WRD, Haul Roads, Klipbankfontein WRD, Prospecting, Stormwater Management Infrastructure, Excess Water Discharge, Game Farming.
Kapstevel 541	SIOC	Kapstevel Pit, Kapstevel WRD, Haul Roads, Stormwater Management Infrastructure, Prospecting, Livestock Farming, Game Farming, Residence (land manager), Access Roads.
Wolhaarkop 476	SIOC	Livestock Farming, Game Farming.
Welgevonden 486	SIOC	Explosives Magazine, Haul Roads, Kapstevel Pit, Borrow Pits, Game Farming.
Welgevonden 476	SIOC	Borrow Pits, Livestock Farming, Game Farming.

9.15.2 Land use on adjacent properties

Table 9-18 gives a description of land uses on each of the neighbouring properties. Surrounding Land Uses are also illustrated in Figure 11-20.

TABLE 9-17: LAND USE OUTSIDE KOLOMELA MINING RIGHT

Property	Local Name	Residences	Owner	Land Use
Olynfontein 475	Beeshoek Mine	none	Assmang	Iron Ore Mine
Olynfontein 475	Koeispeen	01	Ms. Malie Karsten	Livestock & Game Farming, Health Care Services (Netcare 911)

Property	Local Name	Residences	Owner	Land Use
Olynfontein 475	Olienfontein	02	Charl Viljoen	Livestock & Game Farming
Kalkfontein 474	Kalkfontein	03	Dries van der Walt	Livestock & Game Farming
Soetfontein 491	Soetfontein	04 & 06	Albertus Viljoen	Livestock & Game Farming
Soetfontein 491	Soetfontein	05	Johan Viljoen	Bed and Breakfast, Livestock & Game Farming
Kameelfontein 490	Kameelfontein	07	Johan van Zyl	Livestock & Game Farming
Klipbankfontein 489	Klipbankfontein	08	Ms. Fransiena Bredenkamp	Livestock & Game Farming
Unknown	Wag 'n Bietjie	09	Chris Bredenkamp	Livestock & Game Farming
Kappies Kareeboom 540	Kappies Kareeboom	10 & 11	SIOC	Groenwaterspruit Aquifer Recharge, , Livestock & Game Farming
Grootpan 543 RE	Vleiput	12	De Klerk Family	Regional Road 383, Prospecting, Livestock & Game Farming
Grootpan 543 Portion 1	Grootpan	none	SIOC	. Livestock Farming
Grootpan 543 Portion 4	Witboom	13	De Klerk Family	Regional Road 383. Prospecting, Livestock Farming
Sunnyside 542 Portion 2	Grasvlakte	14	Tjaart Snyman	Prospecting, Livestock Farming
Bermolli 583	Bermolli	15	SIOC	Prospecting, Livestock Farming
Sunnyside 542 Portion 2	Sunnyside	16	SIOC	District Road DD3303, Livestock Farming
Floradale 230	Floradale	18	Coenraad Kotze	Livestock Farming
Vogelwater 480	Vogelwater	20	Rudie Erasmus	Livestock Farming
Broomlands 479	Broomlands	21	Bennie Bredenkamp	Livestock Farming
Kameelhoek 477	Kameelhoek	22	SIOC	Livestock Farming
Kameelhoek 477	Kameelhoek	23	SIOC	Livestock Farming
Aucampsrus 447	Aucampsrus	24	Van Wyk Trust	Regional Road Small-scale Iron Ore Mining, Livestock Farming

9.15.3 Environmental sensitivity map

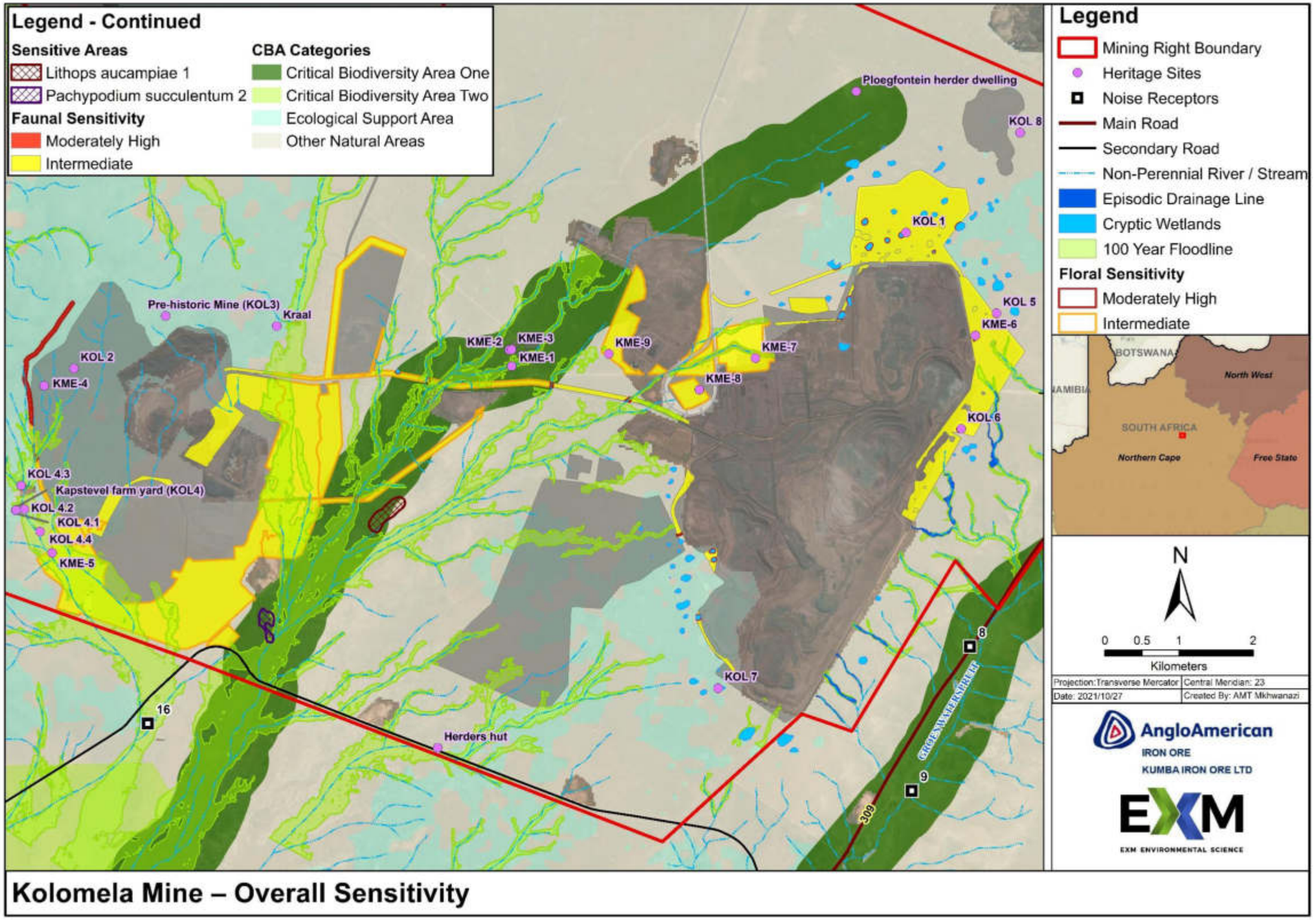


FIGURE 9-22: KOLOMELA LAYOUT WITH SPECIFIC ENVIRONMENTAL FEATURES

10. IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION IN AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS CAN BE REVERSED, AVOIDED, MANAGED, MITIGATED AND EXTENT TO WHICH THEY MAY CAUSE IRREPLACEABLE LOSS OF RESOURCES

10.1 Methodology used in determining the significance of environmental impacts

The impact assessment method used in this assessment takes into account the current environment, the details of the proposed amendment activities and the findings of the specialist studies. Cognisance has been given to both positive and negative impacts that may result from the developments. The significance of the impact is dependent on the consequence and the probability that the impact will occur.

impact significance = (consequence x probability)

Where:

consequence = (severity + extent)/2

and

severity = [intensity + duration]/2

Each criterion is given a score from 1 to 5 based on the definitions given below. Although the criteria used for the assessment of impacts attempts to quantify the significance, it is important to note that the assessment is generally a qualitative process and therefore the application of this criteria is open to interpretation. The process adopted will therefore include the application of scientific measurements and professional judgement to determine the significance of environmental impacts associated with the project. The assessment thus largely relies on experience of the environmental assessment practitioner (EAP) and the information provided by the specialists appointed to undertake studies for the EIA.

Where the consequence of an event is not known or cannot be determined, the "precautionary principle" has been applied and the worst-case scenario assumed. Where possible, mitigation measures to reduce the significance of negative impacts and enhance positive impacts will be recommended. The significance of the impact in light of the mitigation measures has also been rated based on a confidence rating of the mitigation measures.

Consideration will be given to the phase of the project during which the impact occurs. The phase of the development during which the impact will occur will be noted to assist with the scheduling and implementation of management measures.

TABLE 10-1: SEVERITY CRITERIA FOR ASSESSING THE IMPACT SIGNIFICANCE

INTENSITY = MAGNITUDE OF IMPACT	**RATING**
Insignificant: impact is of a very low magnitude	1
Low: impact is of low magnitude	2
Medium: impact is of medium magnitude	3
High: impact is of high magnitude	4
Very high: impact is of highest order possible	5
DURATION = HOW LONG THE IMPACT LASTS	**RATING**
Very short-term: impact lasts for a very short time	**1**
Short-term: impact lasts for a short time e.g. construction period	**2**
Medium-term: impact lasts for the for less than the life of operation.	**3**
Long-term: impact occurs over the operational life of the project	**4**
Residual: impact is permanent (remains after mine closure)	**5**
EXTENT = SPATIAL SCOPE OF IMPACT/FOOTPRINT AREA/NUMBER OF RECEPTORS	**RATING**
Limited: Impact only affects the mine site or part there of	**1**
Neighbours: Limited to the immediate surroundings;	**2**
Local: Affecting a larger area (beyond immediate surroundings or neighbours)	**3**
District: Affects entire district	**4**
Regional: Affects an entire region e.g. Province	**5**
PROBABILITY = LIKELIHOOD THAT THE IMPACT WILL OCCUR	**RATING**
Highly unlikely: the impact is highly unlikely to occur	**0.2**
Unlikely: the impact is unlikely to occur	**0.4**
Possible: the impact could possibly occur	**0.6**
Probable: the impact will probably occur	**0.8**
Definite: the impact will occur	**1**

IMPACT SIGNIFICANCE

NEGATIVE IMPACTS

≤1	Very low	Impact is negligible. No mitigation required.
>1≤2	Low	Impact is of a low order. Mitigation could be considered to reduce impacts. But does not affect environmental acceptability.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts. Mitigation should be implemented to reduce impacts.
>3≤4	High	Impact is substantial. Mitigation is required to lower impacts to acceptable levels.
>4≤5	Very High	Impact is of the highest order possible. Mitigation is required to lower impacts to acceptable levels. Potential Fatal Flaw.

POSITIVE IMPACTS

≤1	Very low	Impact is negligible.

>1≤2	Low	Impact is of a low order.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts.
>3≤4	High	Impact is substantial.
>4≤5	Very High	Impact is of the highest order possible.

DEVELOPMENT PHASE

C	Impact is applicable to the CONSTRUCTION PHASE ONLY
O	Impact is applicable to the OPERATIONAL PHASE ONLY
C&O	Impact is applicable to the CONSTRUCTION AND OPERATIONAL PHASE

10.2 The positive and negative impacts that the proposed activity will have on the environment and the community that may be affected

NOTE: A COMPREHENSIVE ASSESSMENT OF ALL IMPACTS IS GIVEN IN SECTION 10.5. A SHORT DESCRIPTION OF KEY IMPACTS IS PROVIDED BELOW.

The description of the below impacts is based on the baseline environment (Section 9) and the order of the impacts is based on the order as per the baseline description to ease reference for the reader.

10.2.1 Topography

The current as well as future infrastructure (especially WRDs) has and will alter the local landscape and topography. Concurrent rehabilitation and the optimisation of backfilling has the potential to reduce the impact of the mine on the local topography.

10.2.2 Air Quality

The following description was derived from the Air Quality Impact Assessment (Airshed, 2021 – Annexure A of part C)

10.2.3 Dispersion model

Dispersion modelling was undertaken to determine highest daily and annual average ground level concentrations and dustfall rates for each of the pollutants considered in the study. Averaging periods were selected to facilitate the comparison of predicted pollutant concentrations to relevant ambient air quality as well as dustfall regulations.

The impact of operations on the atmospheric environment was determined through the simulation of dustfall rates and ambient pollutant concentrations. Simulated air quality impacts represent those associated with the mine's operations only.

Dispersion models simulate ambient pollutant concentrations and dustfall rates as a function of source configurations, emission strengths and meteorological characteristics, thus providing a useful tool to ascertain the spatial and temporal patterns in the ground level concentrations arising from the emissions of various sources. Increasing reliance has been placed on concentration estimates from models as the primary basis for environmental and health impact assessments, risk assessments and emission control requirements. It is therefore important to carefully select a dispersion model for the purpose.

Three distinct emission scenarios were identified for the modelling purposes

- Scenario 1: 2027 (year with maximum handled of 91.6 [9]Mtpa, approximately 12.7 Mtpa of ore and 78.9 Mtpa of waste).
- Scenario 2: 2030 (year with maximum ore handled at Kapstevel South (eastern side of Kolomela), approximately 11.6 Mtpa of ore and 57.4 Mtpa of waste).
- Scenario 2A: 2030 (similar tonnages handled as scenario 2 but using larger automated trucks to move ore).

The significance of the operational phase of the proposed Kolomela Mine operations were found to be moderate for all the scenarios identified. Assuming the adoption of good practice mitigation and management measures as recommended, the significance of impacts may be reduced to low.

10.2.4 PM 10

Simulated ambient PM10 concentrations as a result of the operational phase of Kolomela mine are within annual and daily NAAQS at all AQSRs during all scenarios (Table 10-2). Refer to pages 32-43 of Annexure A (Part C) for the results of the isopleth models. Exceedances of criteria are expected in close proximity to areas of operations. For Scenario 2, with movement of waste primarily at the Kapstevel South pit, higher impacts occur at AQSR number 18 (~1 km from the southern boundary). For Scenario 2A, with larger haul truck capacity and lower emissions, the impacts are slightly lower than Scenario 2.

Dust generated by vehicles travelling on unpaved haul roads is the most notable contributor to ground level PM10 concentrations.

[9] Million Tonnes Per Annum – Indication of the weight of waste rock and ore that will be handled by Kolomela as part of the operations, including deposition of waste rock at the Waste Rock Dumps and handling of ore.

TABLE 10-2: SIMULATED PM_{10} CONCENTRATIONS

Receptor	Scenario 1		Scenario 2		Scenario 2A	
	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)
1	0.21	1.4	0.10	0.7	0.09	0.6
2	0.26	1.8	0.11	0.8	0.10	0.7
3	0.28	1.9	0.11	0.9	0.10	0.7
4	0.44	2.5	0.16	1.1	0.14	1.0
5	0.45	2.5	0.16	1.1	0.15	1.0
6	0.11	0.7	0.06	0.5	0.06	0.5
7	0.15	0.9	0.08	0.6	0.07	0.6
8	0.12	0.8	0.06	0.5	0.06	0.5
9	0.39	2.4	0.14	0.9	0.13	0.9
10	0.95	3.8	0.91	4.0	0.84	4.0
11	1.39	5.7	0.91	5.0	0.80	5.0
12	2.16	10.2	0.89	9.6	0.82	9.6
13	4.03	11.4	0.71	8.0	0.69	8.0
14	1.63	5.7	0.33	2.4	0.30	2.5
15	0.98	5.0	1.32	6.9	1.26	6.7
16	0.24	1.5	0.30	2.0	0.28	2.0
17	0.39	2.3	0.49	3.2	0.48	3.1
18	7.79	28.8	10.37	37.0	10.22	37.2
19	0.25	1.8	0.32	2.3	0.30	2.2
20	0.10	0.9	0.12	1.1	0.11	1.1
21	0.12	1.2	0.15	1.6	0.15	1.6
22	0.12	1.1	0.15	1.5	0.14	1.5
23	0.35	2.8	0.46	3.9	0.44	3.8
24	0.30	2.3	0.39	3.2	0.37	3.0
25	0.18	1.1	0.18	1.3	0.16	1.2
NAAQS	**40**	**75**	**40**	**75**	**40**	**75**

10.2.5 PM 2.5

Simulated ambient PM2.5 concentrations as a result of the operational phase of Kolomela mine are within annual NAAQS at all AQSRs during all scenarios (Table 10-3). Exceedances of criteria are expected in close proximity to areas of operation (**Error! Reference source not found.** to **Error! Reference source not found.**). For Scenario 2, with movement of waste primarily at the Kapstevel South pit, higher impacts occur at AQSR number 18 (~1 km from the southern boundary). Dust generated by vehicles travelling on unpaved haul roads, wind erosion, and crushing are the most notable contributors to ground level PM2.5 concentrations.

TABLE 10-3: SIMULATED $PM_{2.5}$ CONCENTRATIONS

Receptor	Scenario 1		Scenario 2		Scenario 2A	
	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)	Annual Average Conc. (µg/m³)	99th Percentile Daily Conc (µg/m³)
1	0.02	0.2	0.01	0.1	0.01	0.1
2	0.03	0.2	0.02	0.1	0.01	0.1
3	0.03	0.2	0.02	0.1	0.02	0.1
4	0.06	0.4	0.03	0.3	0.03	0.3
5	0.06	0.4	0.03	0.3	0.03	0.3
6	0.01	0.1	0.01	0.1	0.01	0.1
7	0.03	0.2	0.02	0.2	0.02	0.2
8	0.01	0.1	0.01	0.1	0.01	0.1
9	0.05	0.3	0.03	0.2	0.02	0.2
10	0.17	2.6	0.17	2.6	0.16	2.6
11	0.27	4.3	0.22	4.2	0.21	4.2
12	0.45	8.1	0.33	8.0	0.32	8.0
13	0.63	7.0	0.30	6.8	0.30	6.8
14	0.25	2.1	0.12	1.9	0.12	1.9
15	0.14	1.3	0.18	1.3	0.17	1.3
16	0.04	0.5	0.04	0.5	0.04	0.5
17	0.06	0.5	0.07	0.5	0.07	0.5
18	1.12	12.4	1.38	12.4	1.36	12.4
19	0.03	0.3	0.04	0.4	0.04	0.4
20	0.01	0.1	0.02	0.1	0.01	0.1
21	0.01	0.1	0.02	0.2	0.02	0.2
22	0.02	0.1	0.02	0.2	0.02	0.2
23	0.04	0.3	0.05	0.4	0.05	0.4
24	0.03	0.3	0.04	0.3	0.04	0.3
25	0.02	0.1	0.02	0.1	0.02	0.1
NAAQS	**20**	**40**	**20**	**40**	**20**	**40**

10.2.6 Dust Fall

Simulated dust fall rates as a result of the operational phases at Kolomela mine are low and within the NDCR for residential areas at all AQSRs during all scenarios. Although incremental dust fall rates are below NDCRs at AQSRs, exceedances of criteria are expected in close proximity to areas of operation (Figures 10-1 to 10-3). The NDCR is exceeded at the southern boundary.

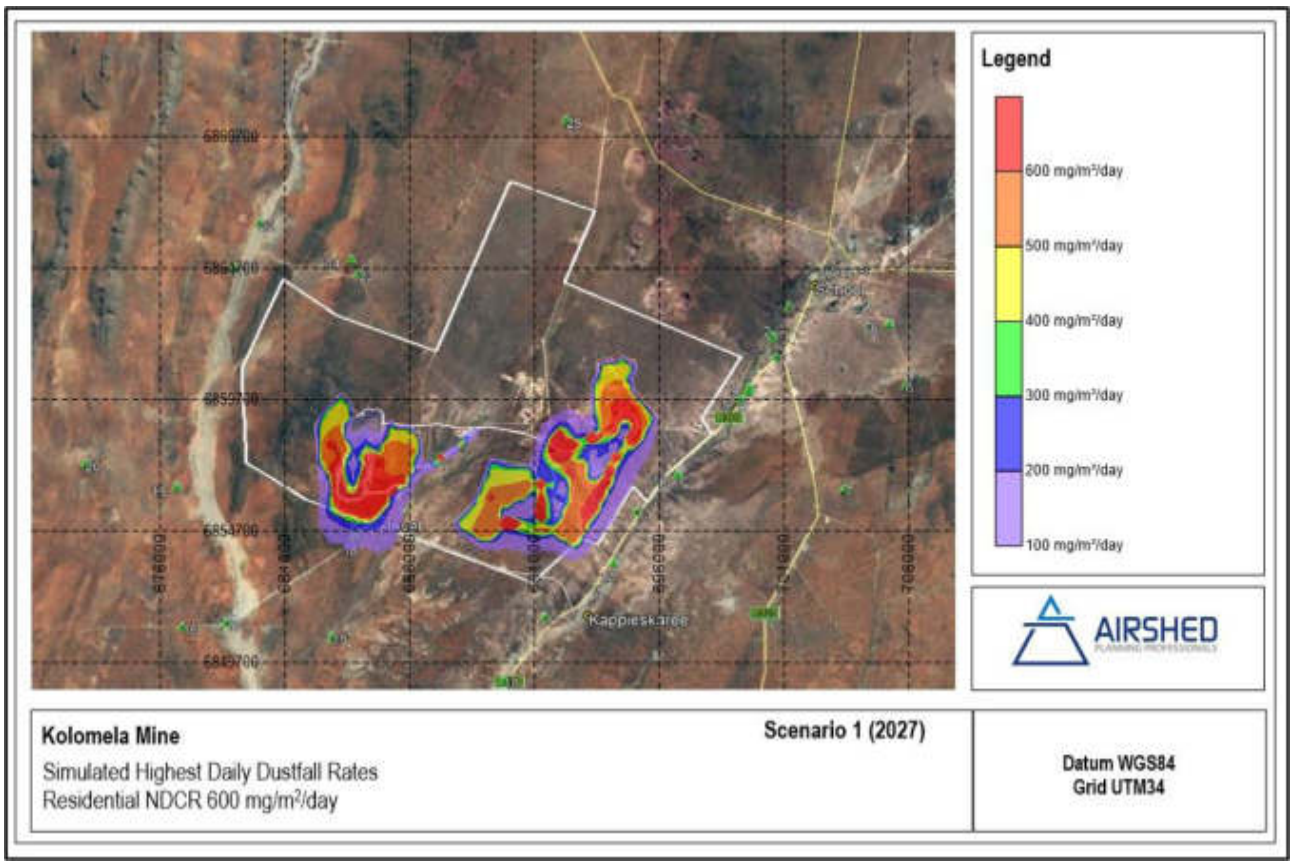


FIGURE 10-1: HIGHEST DAILY DUSTFALL RATES AS A RESULT OF SCENARIO 1 (2027)

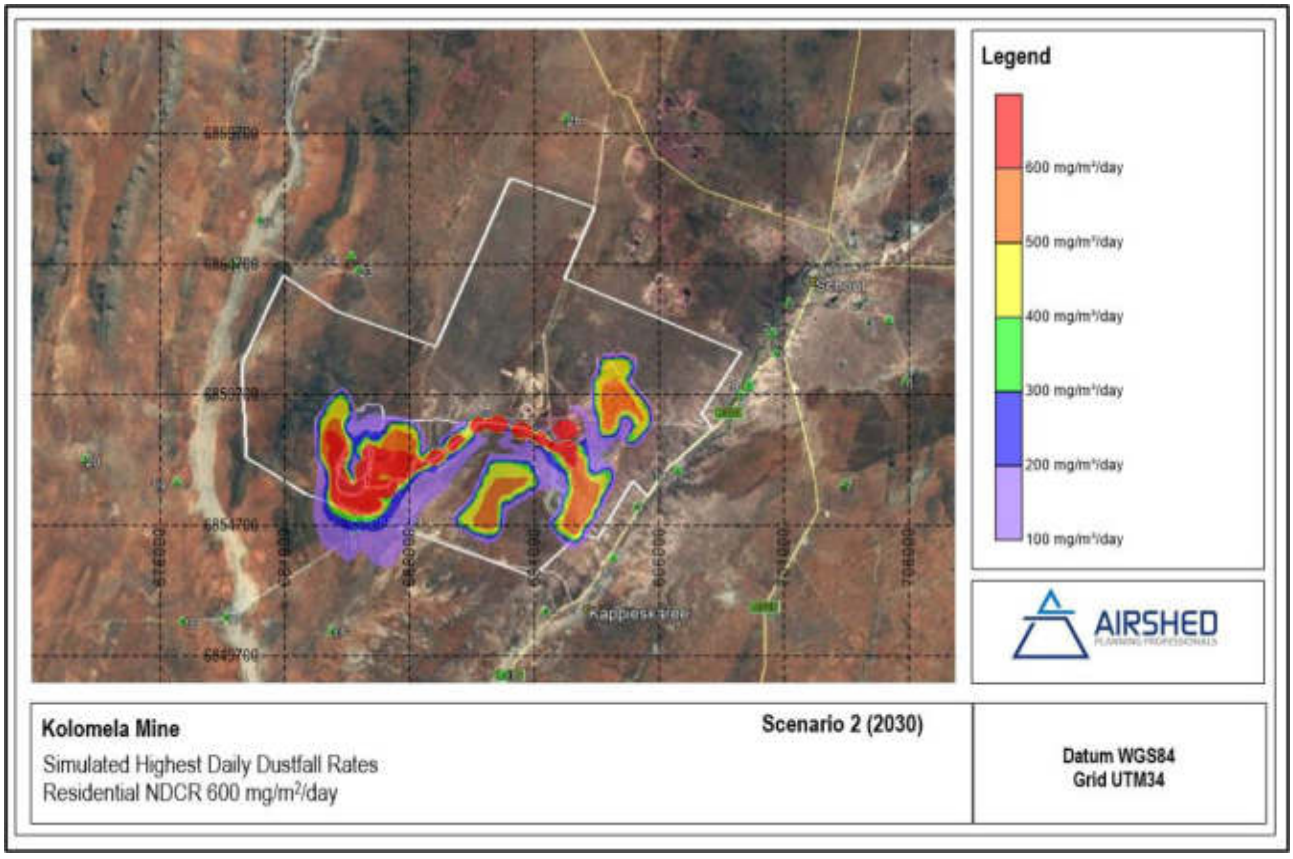


FIGURE 10-2: HIGHEST DAILY DUSTFALL RATES AS A RESULT OF SCENARIO 2 (2030)

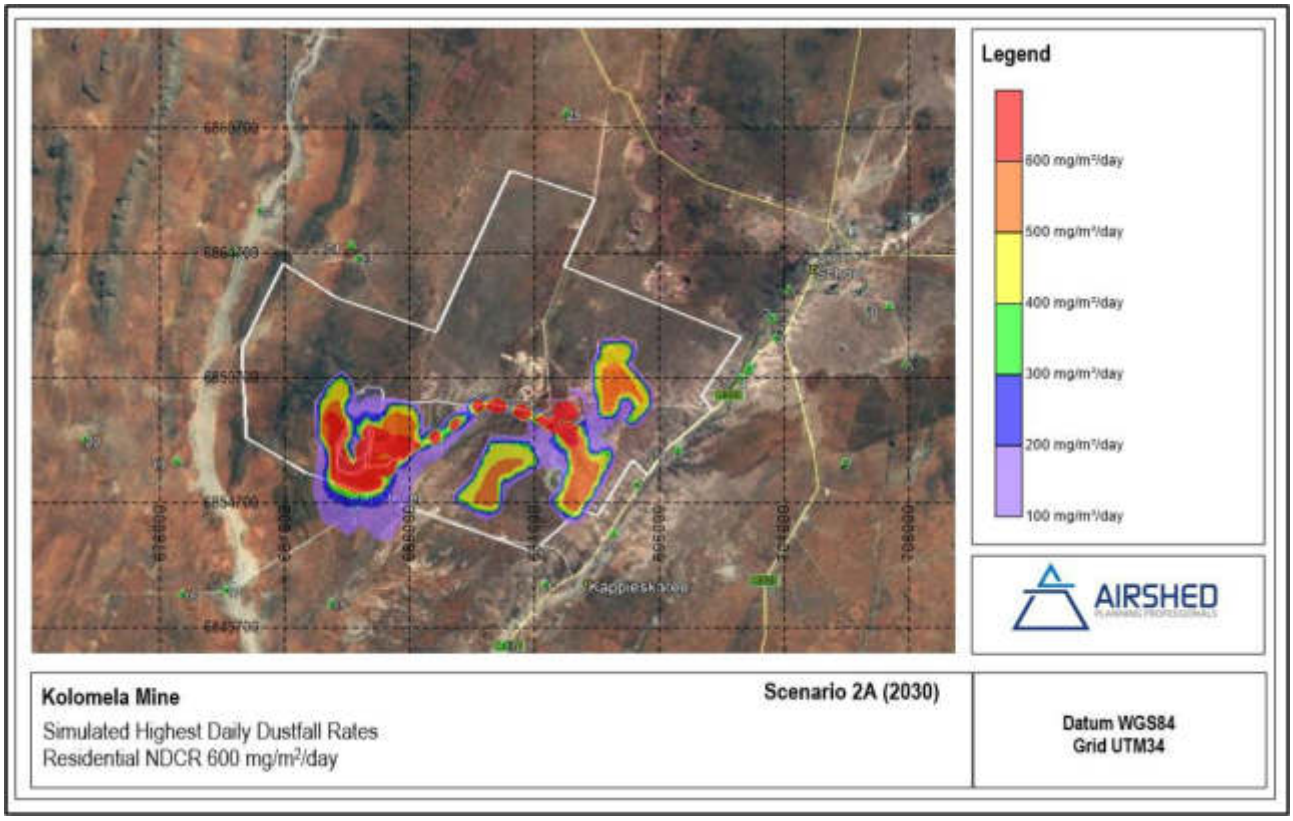


FIGURE 10-3: HIGHEST DAILY DUSTFALL RATES AS A RESULT OF SCENARIO 2A (2030)

10.2.7 Noise Impacts

A Noise Impact Assessment (Airshed, 2021) (Annexure B of Part C) was conducted to determine the potential increase in noise levels from the baseline environment and to assess the potential impacts on sensitive noise receptors. The baseline noise levels were based on various previous noise studies conducted in the area.

Two operational years were selected to reflect the maximum noise impacts:

- Operational year 2022 – maximum noise impacts to the eastern section of Kolomela
- Operational year 2030 – maximum noise impacts to the western section of Kolomela

Baseline noise levels at the respective receptors was used to predict the potential increase of noise levels and to predict whether the increase will exceed the International Finance Corporation (IFC) noise guidelines for residential areas.

Table 10-4 provides a summary of simulated noise levels for the operational period 2022 and 2030 at NSRs. Noise levels due to Kolomela Mine operations for the periods 2022 and 2030 are predicted to exceed the night-time IFC noise guidelines for residential areas at the NSR16 only (south of Kapstevel mining area). Noise impacts at all other identified NSRs are within the IFC guidelines for residential areas.

Results for proposed 2022 and 2030 Kolomela Mine operations are presented in isopleth form

(Figure 11 to Figure 19) in the Noise Impact Assessment.

For a person with average hearing acuity an increase of less than 3 dBA in the general ambient noise level is not detectable. The increase in noise levels above the baseline for proposed operations for the periods 2022 and 2030 is more than 3 dBA at the NSR16. According to SANS 10103 (2008). It should be noted that NSR16 is a farm owned by the Kolomela Mine. If noise levels due to the project exceed the IFC guidelines and become an annoyance at NSR16 after mitigation measures have been implemented, consideration should be given to relocating the residences at this site.

The significance of construction and decommissioning phase noise impacts on nearby NSRs is considered moderate (without mitigation) and low (with mitigation).

TABLE 10-4: SUMMARY OF SIMULATED NOISE LEVELS (PROVIDED AS DBA) FOR PROPOSED OPERATIONS (YEAR 2025) AT NSR WITHIN THE STUDY AREA

NSR	Kolomela (2022)		Kolomela (2030)		Kolomela (2030 - autonomous)		Baseline		Increase above baseline[(b)] for 2022		Increase above baseline[(b)] for 2030		Increase above baseline[(b)] for 2030 - autonomous	
	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night	Day	Night
1	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0
2	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0
3	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0
4	-	-	-	-	-	-	40.5	38.2	0.0	0.0	0.0	0.0	0.0	0.0
5	-	-	-	-	-	-	40.5	38.2	0.0	0.0	0.0	0.0	0.0	0.0
6	-	-	-	-	-	-	40.5	38.2	0.0	0.0	0.0	0.0	0.0	0.0
7	-	-	-	-	-	-	44.8	39.7	0.0	0.0	0.0	0.0	0.0	0.0
8	35.7	35.8	-	-	-	-	44.8	39.7	0.5	1.5	0.0	0.0	0.0	0.0
9	32.9	33.2	-	-	-	-	44.8	39.7	0.3	0.9	0.0	0.0	0.0	0.0
10	-	-	-	-	-	-	32.6	34.9	0.0	0.0	0.0	0.0	0.0	0.0
11	-	-	-	-	-	-	44.8	39.7	0.0	0.0	0.0	0.0	0.0	0.0
12	-	-	-	-	-	-	44.8	39.7	0.0	0.0	0.0	0.0	0.0	0.0
13	-	-	-	-	-	-	32.6	34.9	0.0	0.0	0.0	0.0	0.0	0.0
14	-	-	-	-	-	-	32.6	34.9	0.0	0.0	0.0	0.0	0.0	0.0
15	-	-	-	-	-	-	32.6	34.9	0.0	0.0	0.0	0.0	0.0	0.0
16	44.6	**45.1**	50.7	**51.2**	51.1	**51.6**	44.0	38.9	3.3	7.1	7.5	12.5	7.9	12.9
18	-	-	-	-	-	-	42.7	37.4	0.0	0.0	0.0	0.0	0.0	0.0
20	-	-	-	-	-	-	39.3	39.1	0.0	0.0	0.0	0.0	0.0	0.0
21	-	-	-	-	-	-	39.3	39.1	0.0	0.0	0.0	0.0	0.0	0.0
22	-	-	-	-	-	-	42.3	34.5	0.0	0.0	0.0	0.0	0.0	0.0
23	-	-	-	-	-	-	42.3	34.5	0.0	0.0	0.0	0.0	0.0	0.0
24	-	-	-	-	-	-	32.6	34.9	0.0	0.0	0.0	0.0	0.0	0.0
BEESHOEK	32.4	32.4	32.4	32.4	32.4	32.4	36.0	36.6	1.6	1.4	1.6	1.4	1.6	1.4
BOLTSHOKO	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0
NEWTOWN	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0
POSTMASBURG	-	-	-	-	-	-	36.0	36.6	0.0	0.0	0.0	0.0	0.0	0.0

10.2.8 Visual

According to the Visual Impact Assessment (EXM, 2021) (Annexure H of Part C), it is anticipated that the existing and proposed expansion will have a moderate to high visual impact on the immediate receiving environment. The highest visual impact will come from infrastructure that will have a high height and large footprint; the infrastructure will stand out against the natural landscape. The smaller surface infrastructure (existing or proposed) will have a lower visual impact. the impact assessment shown that the impacts for the construction phase will have a minor negative significance before mitigation and negligible negative significance after mitigation. For the operational phase the impact will have a moderate negative significance before mitigation and minor negative significance after mitigation. The decommissioning and rehabilitation phase will remain at a minor negative significance for both before and after mitigation.

A viewshed model was created to predict the potential visual exposure of Kolomela based on the infrastructure as well as the location of receptors. Figure 10-4 below shows the cumulative viewshed based on all infrastructure that will be developed during the Kolomela LOM. View shed analysis was also conducted for each prominent activity, i.e. WRDs, product stockpiles, primary crusher etc.

To conclude, the landscape of the area surrounding the project area one must note that it has been already altered by mining activities. The expansion of the current mine is in line with the current land use and will be add to the already landscape. It is not predicted that visual quality of the area currently will be significantly altered by the expansion and cumulative impact of the mine at its complete operation.

The infrastructure and mine area lighting will be visible at night resulting in a negative visual impacts and light pollution. These impacts will occur during the entire Kolomela LOM. The illumination assessment (Section 9 of the VIA) revealed that Kolomela contributes significantly to glare, light trespass and sky glow in the study area due to night time activities. Lights at the WRDs and the plants are the major contributors. The extension activities will have increased light pollution, especially for receptors to the south, near Kapstevel. However, other sources such as Beeshoek mine and Postmasburg town also contribute to light pollution especially to the north and east of the study area. The impacts was assigned a moderate significance.

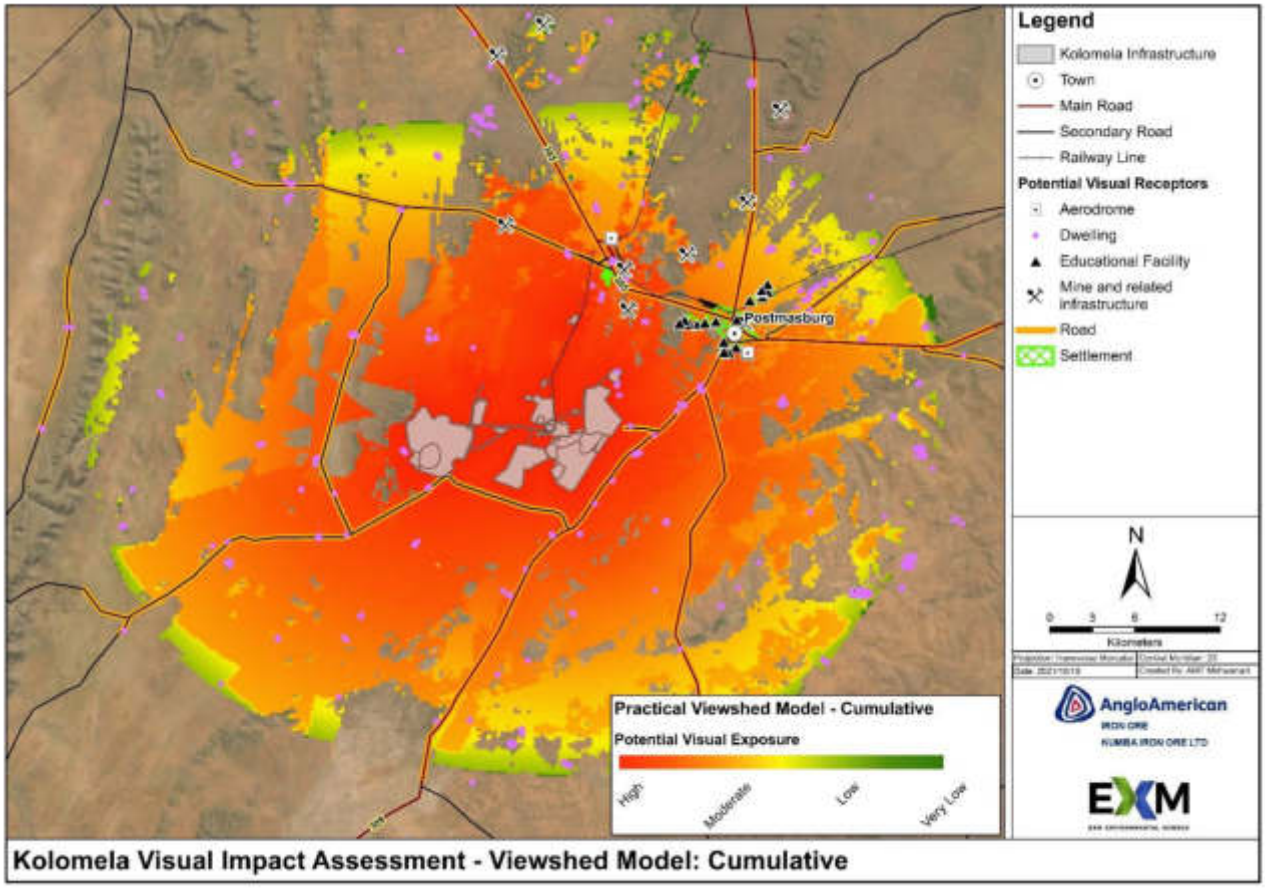


FIGURE 10-4: CUMULATIVE VIEWSHED MODEL

10.2.9 Civil Aviation Sensitivity

A specialist Civil Aviation Sensitivity Study (CASS) was undertaken by GWI Aviation Advisory (Annexure K of Part C) to verify the assigned sensitivity level that was determined for the PV solar facility in terms of the National Department of Environmental Affairs (DEA) screening tool which assigned the facility a medium sensitivity and to check whether a Civil Aviation Compliance Statement is required to the satisfaction of the South African Civil Aviation Authority (SACAA) would be required. The following was the main finding of the study:

The preferred development site falls outside the approach and take-off/climb surfaces of Tommy's Field and Postmasburg Airfields and the PV Facility is therefore expected to contribute minimal additional risk to safe operations at the aerodromes. PV panel arrays and transmission lines are expected to be below the height limit of 45 m. There is no evidence of any ground-based civil radar installations closer than 15 km or within the 15-35 km distance limits of the preferred development site. An analysis of the risk that reflections off PV panels might constitute to pilots of approaching aircraft has been undertaken, with the conclusion that minimal likelihood exists that reflections would pose additional safety risks over the prevailing situation, where the sun itself might on rare occasions be in an unfavourable position relative to

approaching aircraft

The study concluded, "in light of the analysis conducted as part of this report, it is concluded that the proposed solar PV array and associated ground-based and powerline infrastructure will not materially impact either radar/navigation infrastructure in the vicinity, nor present any material additional risks to operations at either Tommy's or Postmasburg aerodromes. On this basis, it is thus recommended that the Sensitivity Classification of the proposed facility be amended to 'low', meaning that no further actions are required in terms of Compliance Statement".

10.2.10 Biodiversity

The following description was derived from the Floral and Faunal Assessments conducted by Scientific Terrestrial Services (August, 2021) (Annexures C and D of Part C) as well as the Biodiversity Assessment undertaken by Omni Eko (2015).

10.2.10.1 Flora:

Prior to mitigation measures implemented, the impact of the activities associated with Kolomela on the floral ecology is anticipated to vary between the different habitat units for the proposed development within the focus area. The findings of the study correlate with the findings of the which assessed Kolomela's impact in 2015 for the existing activities associated with Kolomela mine. The impact on biodiversity should be viewed from a cumulative perspective (current and planned infrastructures) and the risk assessment took into account the cumulative effect of Kolomela.

Prior to mitigation measures, the impact significance scores were as follows:

- Preconstruction and Planning Phase: This phase scored an impact significance ranging between high and very low;
- Mining (i.e., Construction & Operational) Phase: This phase scored an impact significance ranging between high and very low; and
- Decommissioning & Closure Phase: This phase scored an impact significance range between medium-high and very low.

With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the focus area may be reduced to medium-low and very low levels for all the phases associated with the proposed development. As part of the rehabilitation actions, disturbed areas not within the development footprint must be rehabilitated appropriately and AIP establishment controlled within such areas. Infrastructure already developed as part of Kolomela already had an impact flora and the impact will therefore be cumulative taking into account existing and

proposed activities.

The above rating correlates with that of the Biodiversity Assessment undertaken by Omni Eko in 2015 which indicated that the impacts associated with Kolomela infrastructure has a high significance pre-mitigation and low to moderate post mitigation. Therefore, a conservative approach will be undertaken for the risk assessment.

STS (2021) indicated that loss of natural habitat areas such as the Calcrete Habitat, Kalahari Thornveld, Mountain Bushveld Habitat, and the Watercourse Habitat will be unfavourable and will result in local loss of floral habitat and diversity. These habitat units are representative of their reference states, albeit somewhat modified due to current and historic disturbances. Considering that the Postmasburg Thornveld and the Kuruman Mountain Bushveld are endemic vegetation types (Skowno et al, 2019) further impact on the remaining extent of the currently least concern, but poorly protected, vegetation types could increase their threat status. Loss of Cryptic Wetlands and Linear Drainage Lines (i.e., the Watercourse Habitat) should be avoided as these are significant biodiversity features for which impacts cannot be fully mitigated or restricted to the local scale – residual impacts are thus deemed unavoidable.

The focus area is associated with several protected floral species. Permits from the NCDENC (for provincially protected species) and authorisation from the DFFE (for nationally protected species) should be obtained to remove, cut, or destroy any of the above-mentioned protected species before any vegetation clearing may take place. The proposed development will not impact on any threatened ecosystems. The development will, however, impact on CBA1 and ESA habitat (particularly within the central section of the focus area).

10.2.10.2 Fauna:

Overall, the perceived impact significance of the proposed development (prior to mitigation) on faunal habitat, diversity and SCC range from medium high to low for all habitats within the focus area. With mitigation measures impacts can be reduced to lower levels in most cases. As impacts cover relatively large areas the impacts scores are relatively high, yet as a result of the footprint adjacent historic or current infrastructure no regional impacts are anticipated. The potential for large scale impacts is unlikely if recommended mitigation measures are implemented. The findings correlate with the findings of the Biodiversity Assessment undertaken by Omni Eko in 2015 for the existing activities associated with Kolomela mine which indicated that the impacts associated with Kolomela infrastructure has a high significance pre-mitigation and low to moderate post mitigation. Impact should be viewed from a cumulative perspective (current and proposed activities) and the risk assessment of this report was conducted to reflect the cumulative effect.

Impacts to SCC are anticipated as the focus area offers suitable habitat in terms of foraging and/or breeding for several SCC. Impacts do not reach high impacts as most SCC, except invertebrates, are anticipated to utilise the focus area on an intermittent basis for foraging and not on a permanent basis as a result of the constant human movement. *Ardeotis kori* (Kori Bustard, NT) (observed on site) and *Neotis ludwigii* (Ludwig's Bustard, EN) may breed within the focus area, however, the high degree of human movement may disturb these reclusive species pushing them to breed beyond the focus areas. Impacts, without mitigation, to SCC range from medium high to very low through all phases of the development. Mitigation, if implemented correctly, will reduce the impact significance to SCC in most habitats. However as the more sensitive Mountain Bushveld provides valuable habitat to several fauna impacts to this unit remain medium high.

10.2.10.3 Avifaunal:

Scientific Terrestrial Services (STS) conducted an Avifauna Assessment (Annexure J of Part C) for the proposed Solar Photovoltaic (PV) Project. From the impact assessment it is evident that prior to mitigation, the impacts on avifaunal SCC are of medium low to low significance levels, with higher impact significance activities occurring as a result of the establishment of the transformation of the Tarchonanthus - Senegalia Thornveld. This activity will likely result in a decrease in avian richness and abundance of SCC within the study area. If effective mitigation takes place, most impact may be reduced to lower significance levels.

The proposed activities will lead to the transformation of natural Tarchonanthus - Senegalia Thornveld to an extent that it will no longer be suitable for most avifauna. Migrations to adjacent habitat will likely occur decreasing species richness within the study area and increasing competition for resources in the surrounding habitat, reducing avian abundances. It is unlikely that avian diversity will return to baseline levels.

The proposed development is thus deemed likely to pose a threat to SCC due to the loss of habitat within the study area, yet, regional impacts are not anticipated if mitigation measures are implemented.

10.2.11 Surface Water Resources

According to the Freshwater Ecological Assessment (SAS, 2021) (Annexure E of Part C), impacts on surface water resources, including wetland pans and drainage lines associated with the proposed expansion of infrastructure will be moderate. However, the 2015 Freshwater Ecological Assessment (SAS, 2015) which assessed existing risks associated with infrastructure and activities to water courses indicated that impacts on wetland pans associated with the Kolomela infrastructure (Ploegfontein pits), as well as the Leeuwfontein north WRD and Klipbankfontein

WRDs etc) have a high significance due to the extent of the infrastructure and presence of numerous pans. There is an existing impact on surface water resources related to Kolomela. The impact assessment was conducted from a cumulative perspective and the risk evaluation in this report took into account existing as well as future impacts. The wetlands and episodic drainage lines that will be affected are illustrated in Figure 10-5 below. Impacts will potentially include the following:

- Loss of wetland habitat and ecological structure.
- Changes to wetland ecological service provision.
- Impacts on wetland hydrological function.
- Impacts on water quality.

Mining related activities in the vicinity of wetland features are likely to result in change of the natural hydrological regime of the features due to increased runoff and infrastructure impeding flow. However, if layout planning and mining activities are undertaken with cognisance of the sensitivity map as provided in this report the probability and extent of impact occurring can be lowered. Furthermore, with the implementation of rehabilitation measures such as reshaping of all areas disturbed by mining to be as representative of pre-mining terrain units the impact can be further reduced.

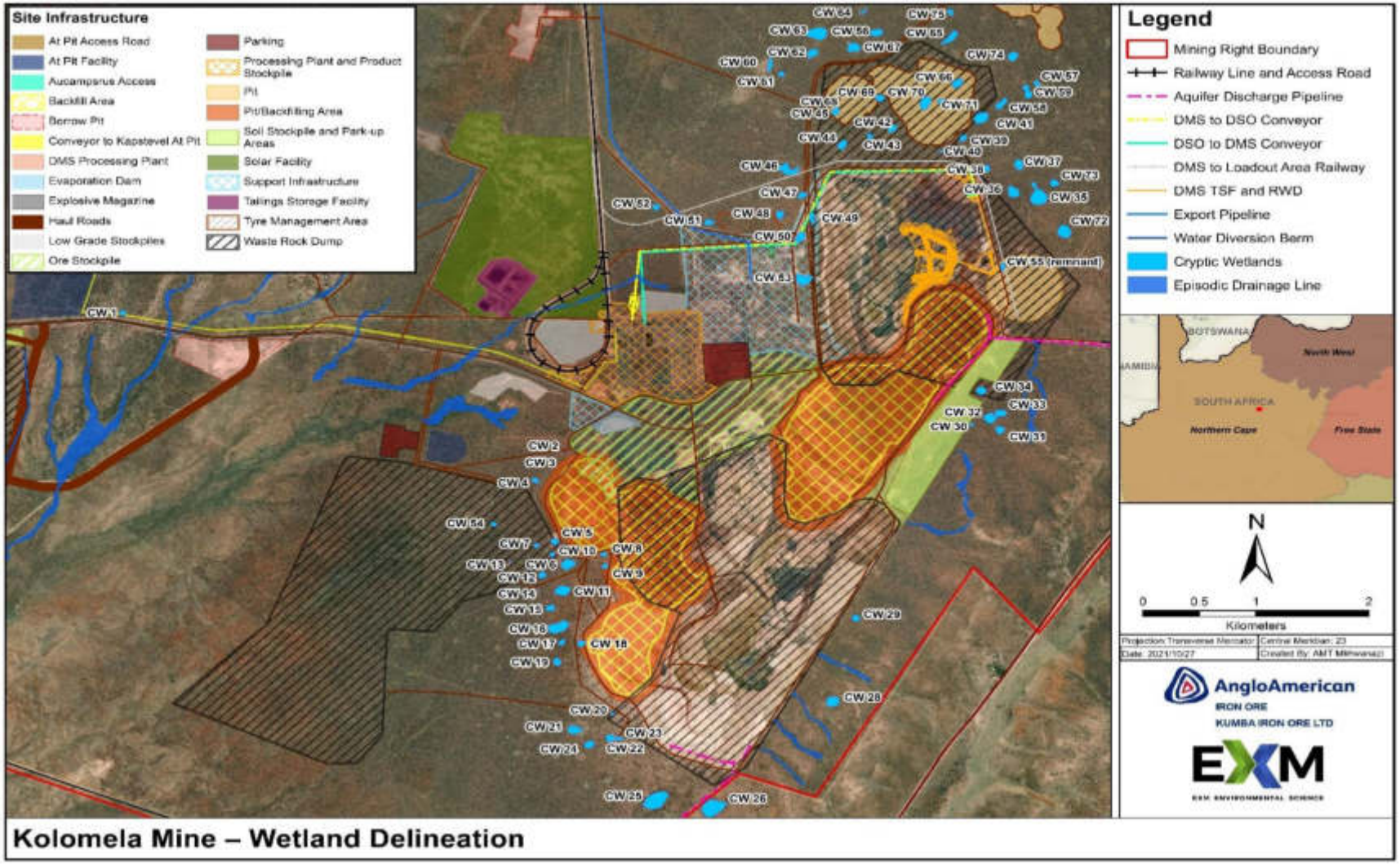


FIGURE 10-5: WETLANDS DELINEATED FOR KOLOMELA

10.2.12 Soil pollution and loss of topsoil

The storage and handling of hazardous substances (i.e. hydrocarbons) at Kolomela during and construction and operational activities may result in spillages and soil pollution. Runoff from disturbed areas during construction may result in soil erosion and loss of topsoil. Soil compaction may also result in impacts on soil characteristics and land capability, especially adjacent areas. The establishment of pits and WRD (as well as other infrastructure) will entail the removal and stockpiling of topsoil to be used for rehabilitation purposes. This must be done correctly to ensure the integrity of the stockpiles for use in rehabilitation.

10.2.13 Hydropedology

A Hydropedological Assessment (Zimpande Research Collaborative, 2021) (Annexure G of Part C) was conducted to investigate the hydropedological properties of the soils in the vicinity of the watercourses within the study area, to infer the potential recharge mechanisms and destination of the transferred water of the surrounding soils that may be affected during the life of the proposed development. It was also an objective to assess the impact of the proposed development activity on the watercourses in terms of the hydropedological drivers. No hydropedological losses is foreseen for the wetlands as interflow (sub-surface flows recharging the wetlands) soils were not present within the catchment of these systems. Even though this is the case, direct impact is foreseen for the wetlands overlain by the proposed developments.

10.2.14 Land use and land capability

Current as well as future infrastructure development especially the pits and WRDs at Kolomela will result in a change of land use and reduce the capability of the land to provide grazing or other purposes. Although the infrastructure will cause a change in land use and capability, Kolomela has a very extensive land management plan in place in which the mine will enhance the capability of the remaining natural areas (with reference to the conservation areas) within the mining right as well as other SIOC owned properties in the surrounding areas.

10.2.15 Groundwater

A geohydrological assessment was undertaken by Gradient (2021) to determine the impact of the current and future dewatering activities on the aquifer yield. The study also focussed on potential impacts related to seepage from WRDs and groundwater quality. The impact assessment (impact ratings) indicates moderate to high impacts on local and regional aquifers as a result of mine dewatering impacts from the Klipbankfontein, Leeuwfontein and Kapstevel opencast pits. Water quality impacts as indicated by the pollution plume models are rated as being mostly low to very low from the waste rock dumps and planned co-disposal facilities.

The numerical groundwater model developed describes the predicted [10]Zone of Influence (ZOI) and aquifer dewatering at Life of Mine (LOM), for the Kolomela.

Objective of the model

The groundwater flow and transport models were developed to:

- Understand the operational and likely post-operational groundwater flow system;
- Simulate the temporal and spatial extent of mass transport from the site (TDS was used); and
- Simulate the aquifer drawdown during and after LOM.

10.2.15.1 Operational phase pit dewatering and groundwater capture zone

According to Gradient (2021), the following dewatering volumes are expected at Kolomela during LOM:

TABLE 10-5: PREDICTED DEWATERING VOLUMES

Pit	Average	Maximum
Leeuwfontein	$2.61e^{+04}$ m^3/d (1088.0 m^3/h)	1800.0 m^3/h
Kapstevel	$1.67e^{+04}$ m^3/d (~700.0 m^3/h)	~1600.0 m^3/h
Klipbankfontein	$2.77e^{+03}$ m^3/d (~115.0 m^3/h)	~240.0 m3/h

The predicted dewatering rate correlate well to the existing groundwater flow model (Itasca, 2021) simulations, however the maximum dewatering rates expected is higher and can be attributed to different pit dimensions

According to Gradient (2021), it is expected that the groundwater drawdown during the Kolomela LOM within the existing monitoring as well as neighbouring and private boreholes will range between 3.0m (regional) to 50.0-100 mbsl (meters below static level) within close proximity to the pit footprints as shown in Figure 10-6. It should be noted that the majority of properties being intercepted by the drawdown zone are owned by SIOC, however there are privately owned properties being impacted on as well especially towards the northern and eastern perimeters. It should also be noted that the zone of impact does reach various boreholes which is current being utilised.

The groundwater capture zone i.e. zone of influence extent will cover an estimated footprint of approximately 509.0 km² at the mine end of life period as indicated in Figure 10-6 depicts the groundwater capture zones for the various operational phases. It should be noted that the simulated groundwater drawdown zone extends beyond the mining right area stretching a

[10] The Zone of Influence (ZoI) is defined as the maximum distance at which the aquifer drawdowns, due to the dewatering activities, will could potentially affect the groundwater regime and water users

maximum distance of ~8.0 km towards the southeast and ~17.0 km in a general north to north-eastern direction. The groundwater drawdown observed in the north-eastern parts of the greater study area can possibly be attributed to existing mine dewatering activities within this area which has been active the last approximately 100 years.

10.2.15.2 Post-closure opencast pits re-watering and decant potential

The decant point/zone is the lowest topographical point of the existing/proposed mining footprint which is in direct connection with surface topography. It can be observed the potential decant elevations for all the planned pit footprints is situated from 20.0 m (Kapstevel Pit) to > 50.0 m (Leeuwfontein and Klipbankfontein Pits) above the pre-mining and calibrated groundwater level and as such it is highly unlikely that decant will occur.

It is estimated that the recovery period i.e. time remaining mine voids will take to fill will be >100 years and beyond the simulation period.

A mine post-closure scenario was also conducted wherein the pit footprints were not backfilled and acted as permanent sinks due to the high evaporation rate expected. It is evident that the highest groundwater elevation will not extend beyond 1180.0 mamsl and will reach equilibrium between 6 to 50 years as summarised in Figure 6.aa in the geohydrological assessment.

Groundwater level recovery within impacted monitoring as well as neighbouring and private boreholes will be a function of the proximity and distance to the dewatering activities as shown in Figure 6.bb and Figure 6.cc in the geohydrological assessment.

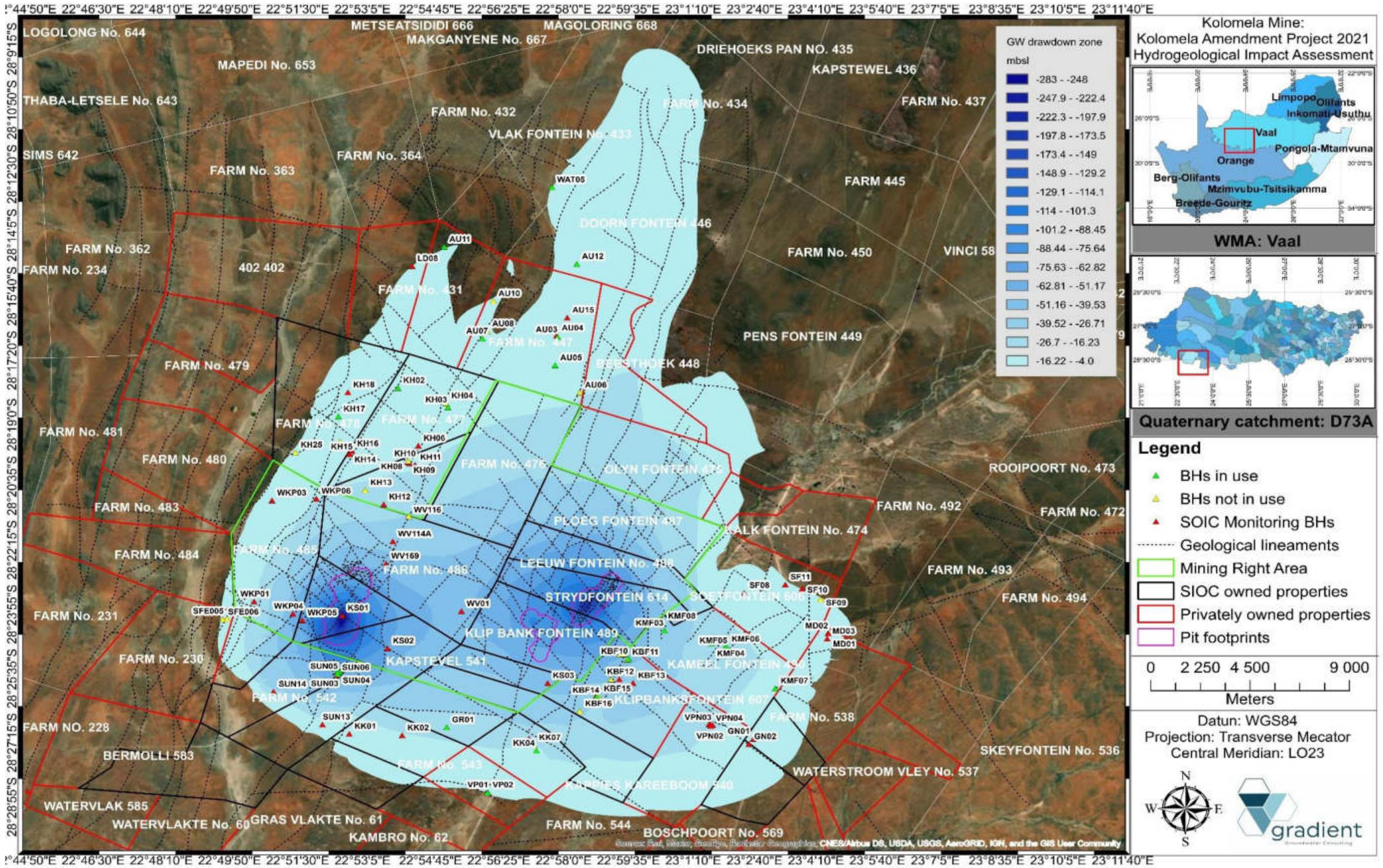


FIGURE 10-6: WATER LEVEL DRAWDOWN AND GROUNDWATER CAPTURE ZONE AFTER THE LOM PERIOD

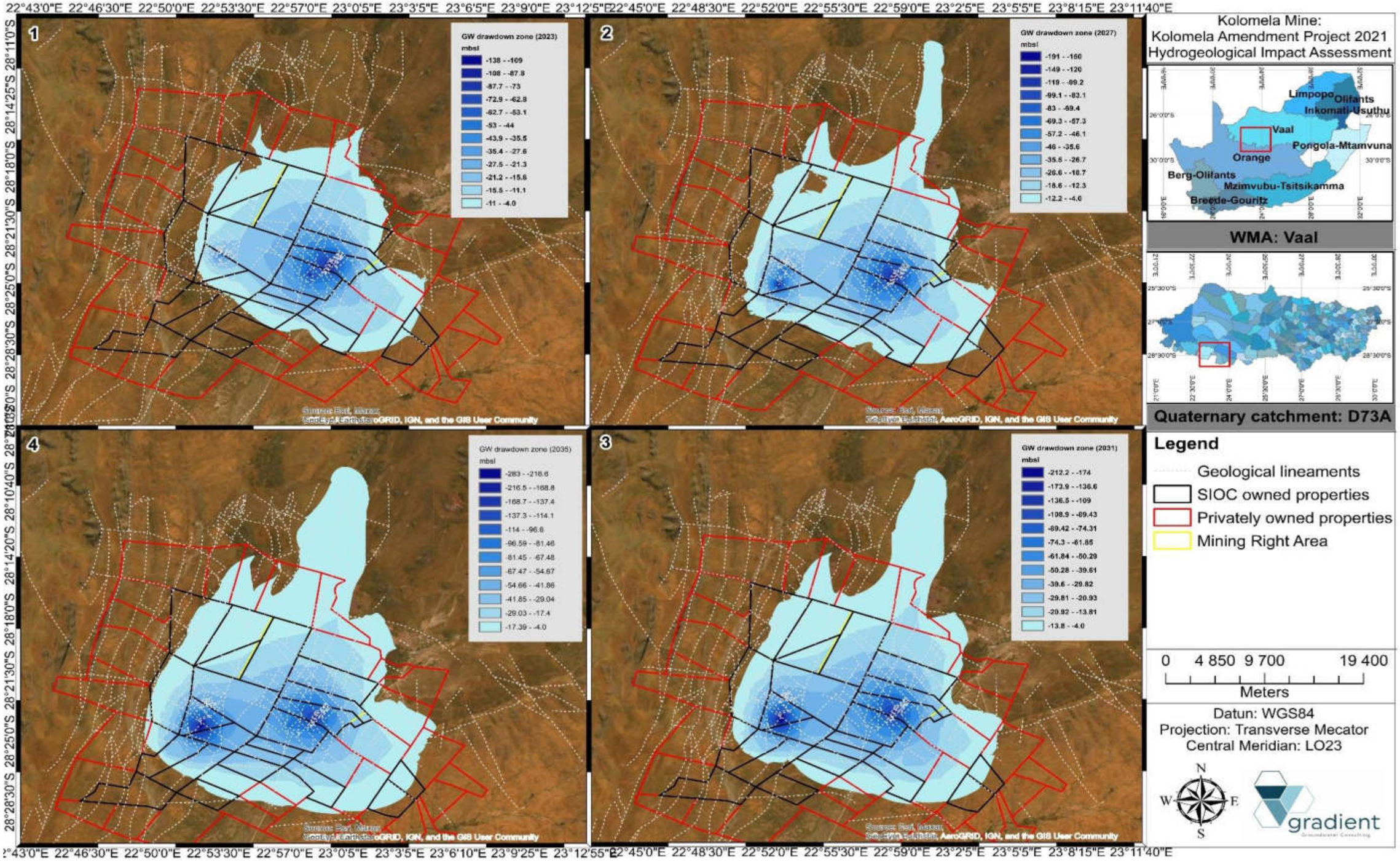


FIGURE 10-7: WATER LEVEL DRAWDOWN AND GROUNDWATER CAPTURE ZONE FOR VARIOUS OPERATIONAL PHASES

10.2.15.1 Pollution plume migration emanating from backfilling of remaining opencasts for the LOM operational period

Figure 10-8 illustrates the expected pollution plume migration within the host aquifer during LoM. The pollution plume extent emanating from the existing and proposed waste body footprints as well as other sources (PCDs, Evaporation Dams, TSF) covers a total area of approximately 27.3 km^2, consisting of 10.8 km^2 (Kapstevel section) and 16.5 km^2 (Klipbankfontein and Leeuwfontein sections). It is observed that the generated pollution plume does not migrate in the expected down-gradient direction due to the negative hydraulic gradient caused by the operational pit dewatering activities constraining plume propagation. The simulation indicates that the pollution plume generated does not reach any neighbouring and privately owned boreholes or drainages situated down-gradient and is limited to the mining right area.

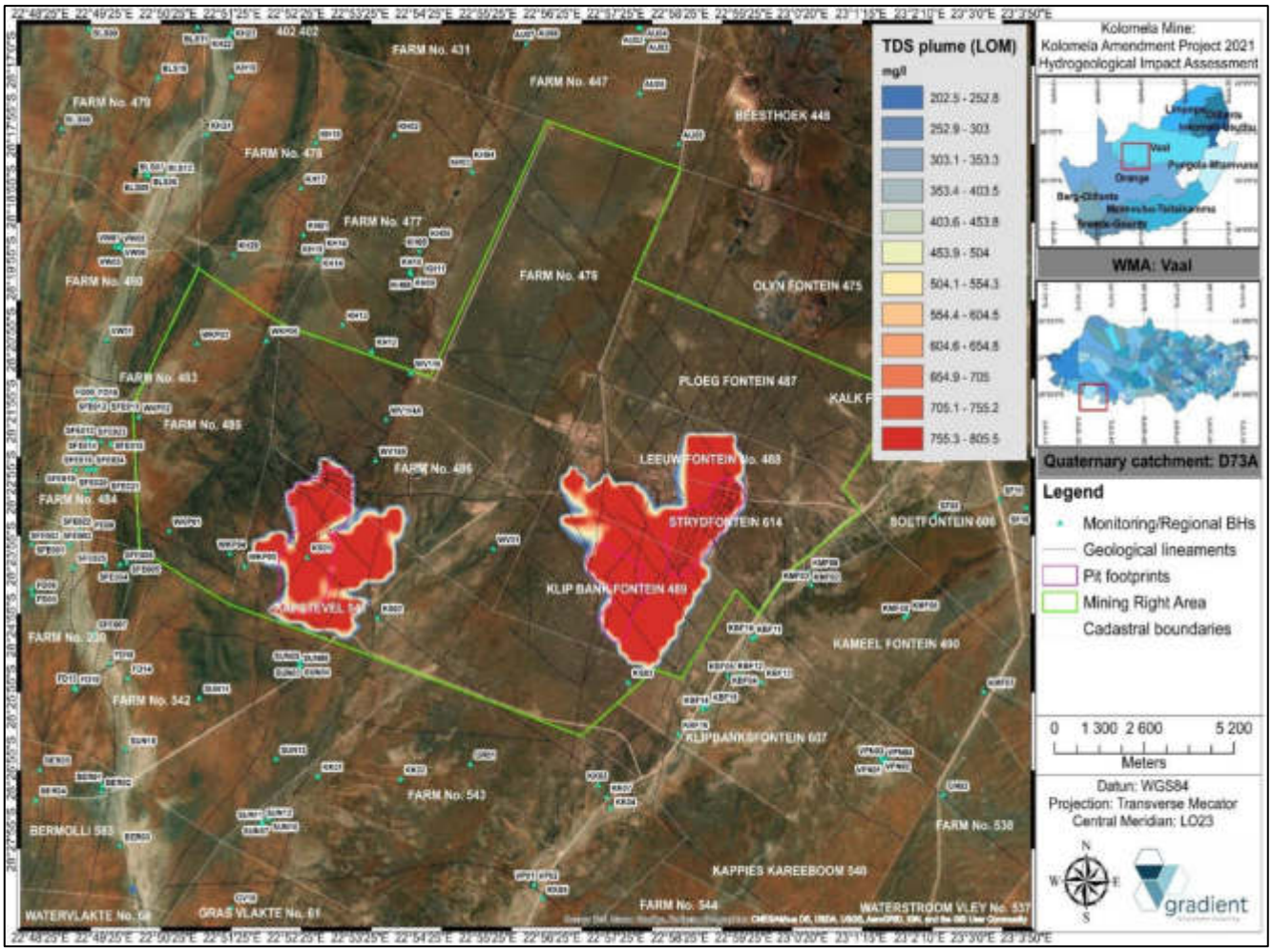


FIGURE 10-8: LOM POLLUTION PLUME MIGRATION WITHIN THE HOST AQUIFER

10.2.15.2 Post-closure pollution plume migration

The simulation indicates that the pollution plume generated does not reach any neighbouring and privately owned boreholes or drainages situated down-gradient, with the Kapstevel pollution plume extending slightly beyond the mining right area.

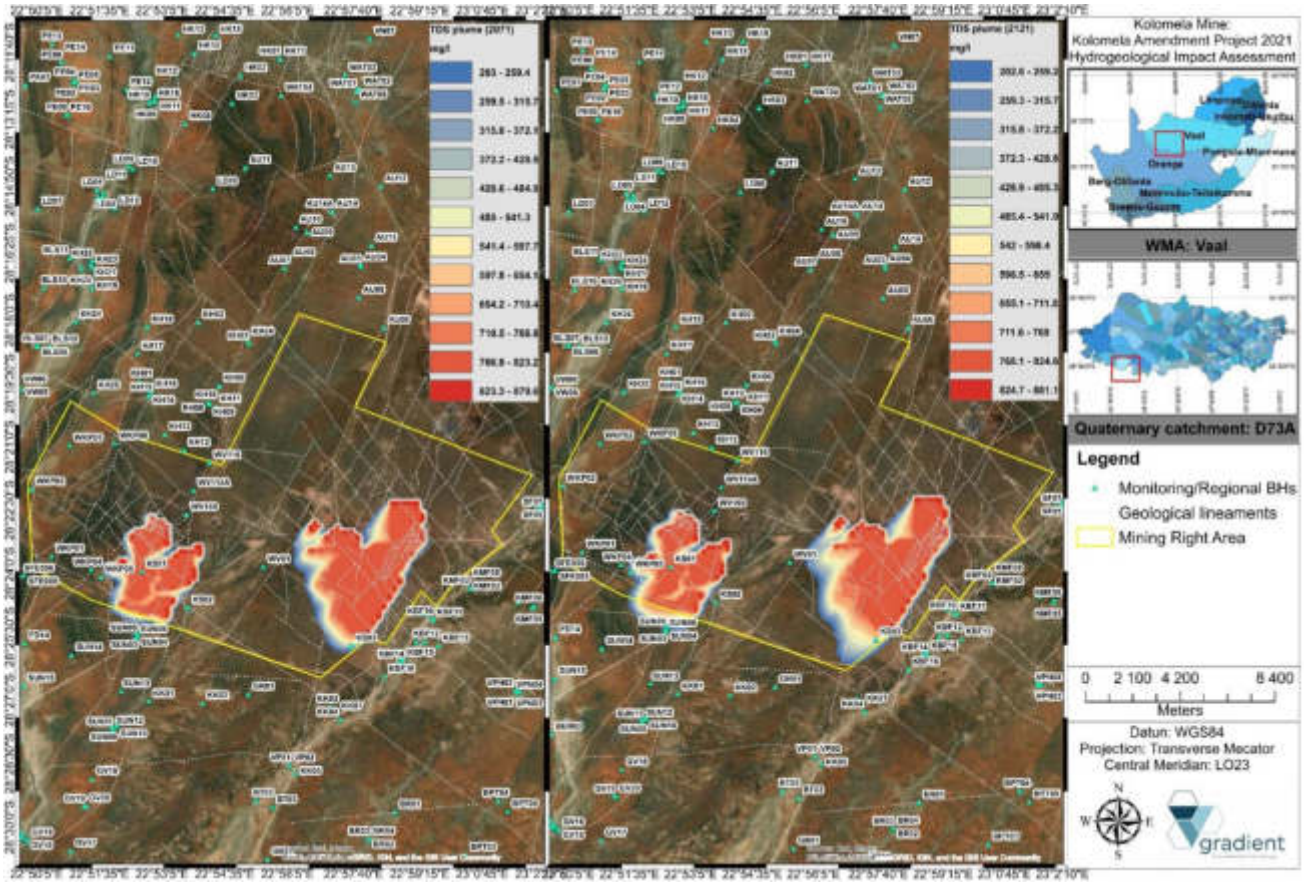


FIGURE 10-9: POST-CLOSURE POLLUTION PLUME MIGRATION FOR A 50-YEAR AND 100-YEAR SIMULATION PERIOD

10.2.15.3 Mitigation and management

The geohydrological assessment simulated a mitigation alternative which evaluates an existing remedial option (artificial aquifer recharge) to limit and constraint the propagation of the groundwater catchment zone and extent. An active management scenario evaluating the mitigating effect of aquifer artificial recharge which Kolomela Mine is currently undertaking by a series of boreholes was simulated. Model simulations suggest a reduction of between 0 to ~6.0m from the groundwater drawdown within the footprint as depicted in Figure 10-10.

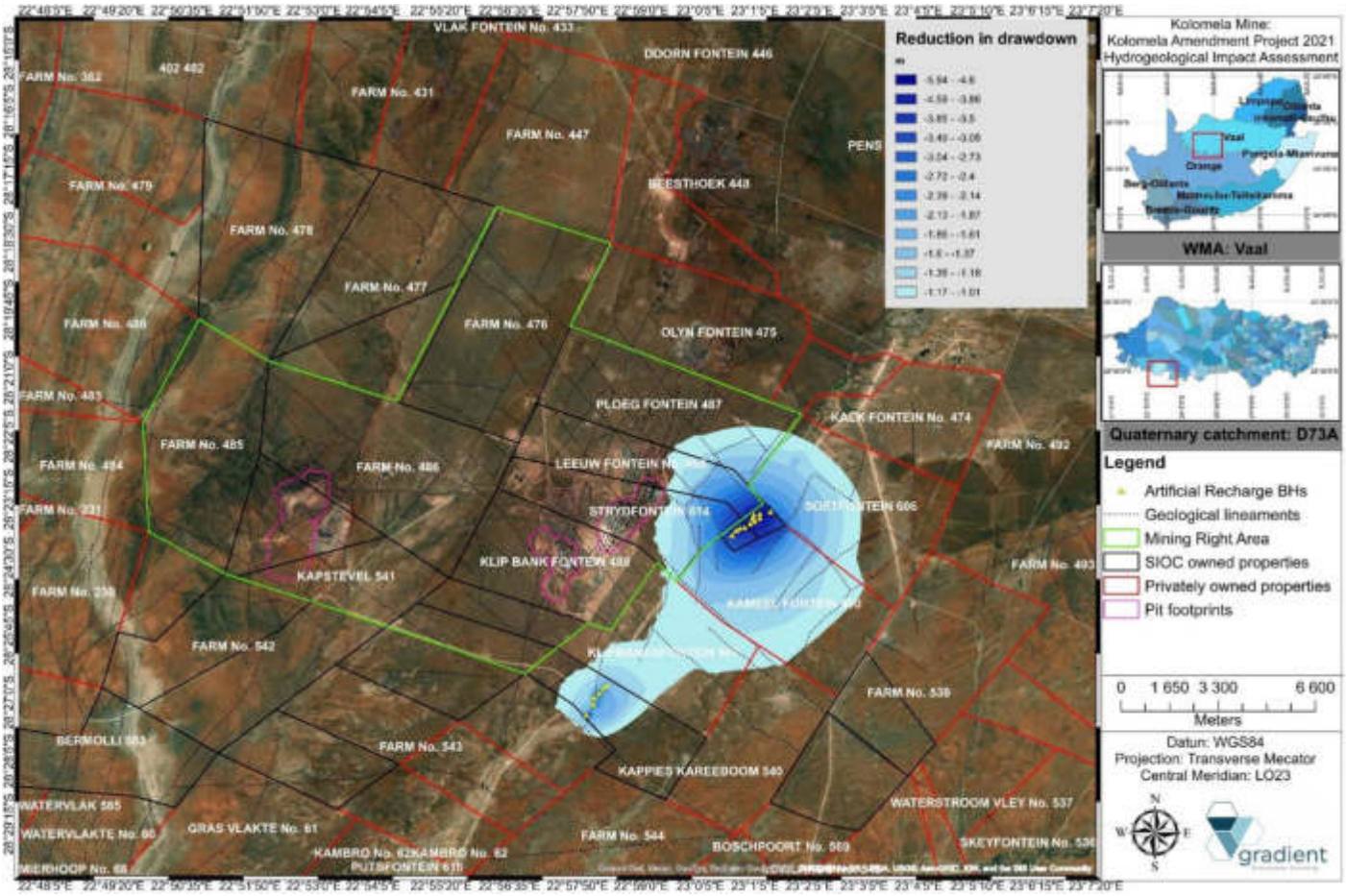


FIGURE 10-10: MITIGATION AND MANAGEMENT- EVALUATING THE EFFECT OF AQUIFER ARTIFICIAL RECHARGE BY A SERIES OF WATER INJECTION BOREHOLES

10.2.16 Heritage and palaeontological Impacts

An analysis of the various components of the HIA indicates a mitigated medium to low negative impact on heritage resources and are expanded on below.

- **Burial Grounds and Graves**

An assessment of the possible impacts of the proposed project on graves and burial grounds (KOL 4.1 & 4.4 as well as KME-1) has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative. No graves will be affected by the existing or future activities at Kolomela and appropriate buffers have been established according to the Kolomela Heritage Management Plan.

- **Historical Sites**

An assessment of the possible impacts of the proposed project on historical heritage resources has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative. KOL 3 is

a historical mine which has high significance, but the Kapstevel WRD footprint has been amended to prevent impacts on this site.

- **Archaeology**

As KME-04, KOL 2 and the findspots (KME-05 – KME-09) located within the Kapstevel WRD footprint were assessed to have low to no heritage significance. The reason for this is that sites of low to no heritage significance will not require mitigation. Although in the case of KOL 2, it was recommended that "should future mining activities expose archaeological material at this site, an archaeologist must be contracted to comment on the significance of the finds" (African Heritage Consultants 2011:20). An assessment of the possible impacts of the proposed project on the previously identified archaeological pan sites (KOL 1, KOL 5, KOL 6, KOL 7, KOL 8) has shown that unmitigated impacts consist of a moderate negative impact. These pans are located either within WRD/pit footprints or close by. By implementing the mitigation measures as listed in the EMPr (part B) these impacts can be managed to low negative.

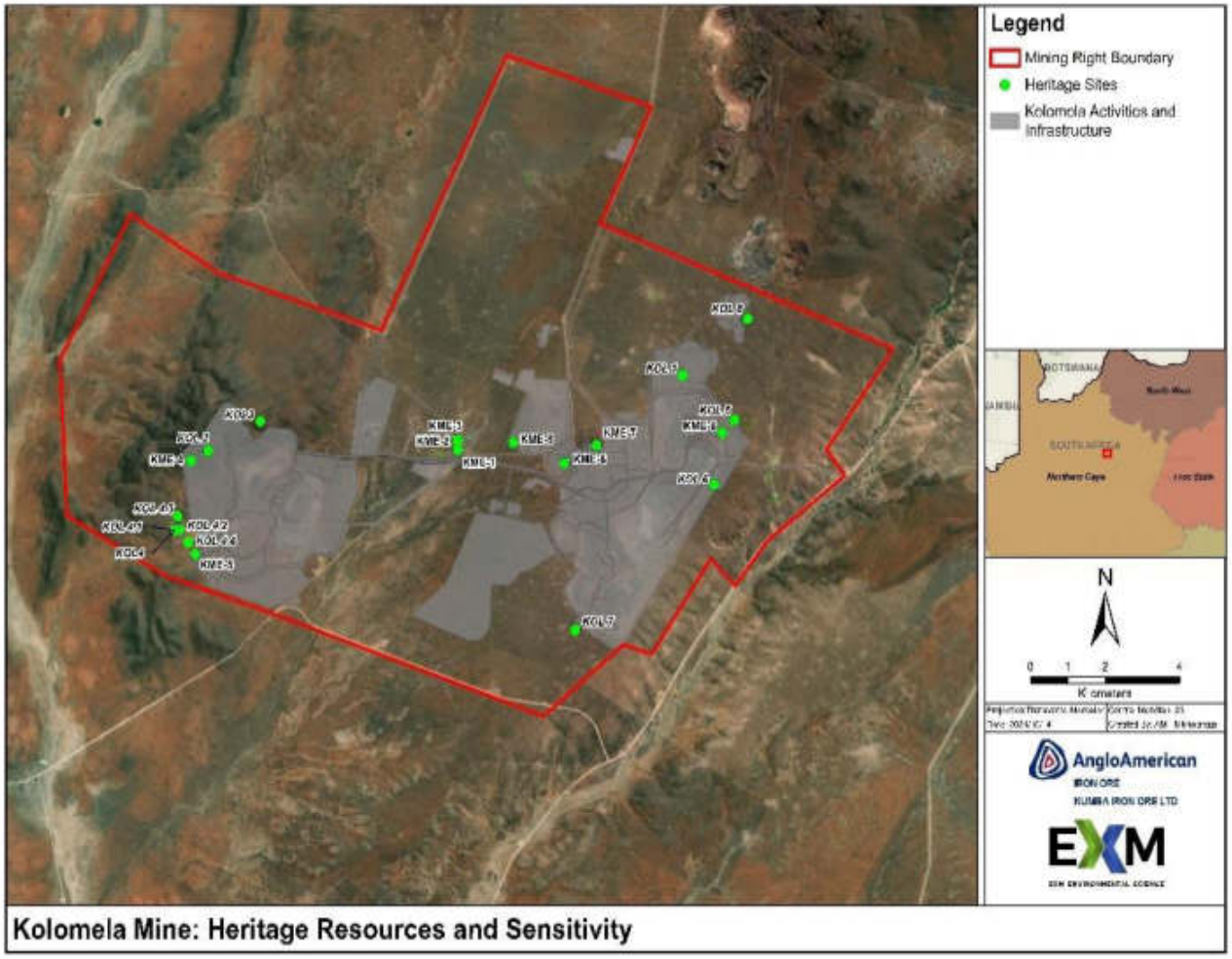


FIGURE 10-11: HERITAGE RESOURCES ASSOCIATED WITH KOLOMELA MINE

10.2.17 Socio-economics

Kolomela mine places a significant role in the local economy with a large proportion of persons relying on Kolomela mine or its contractors for employment and local businesses relying on the activities at Kolomela in terms of providing services and goods. Key benefits of Kolomela mine include direct, direct and indirect employment, with the majority of the Tsantsabane community being dependent on Kolomela mine. The presence of Kolomela mine has also provided for socio-economic investments in infrastructure, education, health services and assistance to the local municipality in terms of service deliver. These benefits, together with other developments in the area have resulted in an influx of persons into the area which means that benefits of continually being diluted due to the pressure of population expansion. As such, negative impacts associated with Kolomela mine and any future projects are largely associated with in-migration, which places pressure municipal, health care and social services. There is an increase in social ills typical of an expanding unemployed population including substance abuse, crime, prostitution, disease, teenage pregnancies, gangs, etc).

Further expansion at the mine will provide some additional employment and construction opportunities through temporary construction activities. The introduction of autonomous trucks at Kapstevel South will result in direct job losses of between 50-80 persons. It is expected that new permanent positions will be created by projects including AHS, which will mostly be filled by Kumba's existing employees via the succession, training and development plan. Filling these positions internally may result in vacancies to be filled via a series of internal transfers or promotions until new positions become available on entry level (a so-called backfilling process). Some new positions are to be created directly, indirectly and induced as a result of future construction project as well as the change to autonomous mining in the future, resulting in a net positive employment benefit as result of projects, including AHS. Furthermore, such projects provide an opportunity for additional financial investments in the local community, particularly aimed at decreasing future dependency on Kolomela mine. This includes investment in upskilling of local persons specifically in semi-skilled vocations (such as operators) which have been identified as being limited in the community in order that such persons can be actively involved in pending and future projects both at Kolomela mine and other developments in the area. In addition, attention is to be placed in technology-based training within the community to place community members in a better positioned to be prepared as industry moves towards FutureSmart mining.

10.2.18 Traffic Impacts

A traffic impact assessment was not undertaken as part of the EIA. However, it is not expected that the expansion activities as the expansion will mostly entail ad hoc projects, (i.e. development of the solar plant) and will cause temporary increase in traffic. A traffic impact assessment was conducted by Jeffares and Green in 2015 as part of the previous EIA to assess the potential impacts associated with Kolomela Mine.

The current network was analysed over a period of 15 years with respect to anticipated developments proposed for Kolomela Mine. It was found that the total traffic will increase by 10% by the year 2028. This will affect user experience. In addition, there may be structural damage to local roads. It is proposed that upgrades be undertaken to alleviate the impact. These include geometric and structural upgrades of selected links. Some gravel roads may require surfacing and ones affected for short periods may require a more comprehensive maintenance plan including dust suppression. Responsibility should be shared between the developers and the road owners (provincial, municipal and private). Alternative routes can also be investigated.

The predicted HIGH impact on traffic could be reduced to MODERATE with successful mitigation.

10.3 The possible mitigation measures that could be applied and the level of residual risk

The mitigation measures for each of the identified impacts are included in Tables 10-3 to 10-6. Mitigation of key impacts and risks are also discussed in detail in Part B: Environmental Management Programme.

The significance of the impact with mitigation has been weighted by multiplying the significance rating without significance by the following, depending on the confidence placed in the successful implementation of the mitigation measures or the effectiveness of those measures in reducing the impact.

Mitigation Confidence Negative Impacts

1	Very High Risk (no confidence)	Measures are very difficult or expensive to implement or are not expected to be effective in reducing the impact (No Confidence)
0.8	High Risk (low confidence)	Measures are difficult or expensive to implement or are expected to have limited effectiveness in reducing the impact (20% Confidence)
0.5	Moderate Risk (moderate confidence)	Measures can be implemented with some effort and cost and/or the measures can be effective in mitigating the impact if implemented (50% Confidence)
0.2	Low Risk (high confidence)	There is high confidence that mitigation measures can be implemented and can be effective in mitigating the impact (80% Confidence)

Enhancement Confidence Positive Impacts

1	Very High Risk (no confidence)	Measures are very difficult or expensive to implement or are not expected to be effective in enhancing the impact.
1.2	High Risk (low confidence)	Measures are difficult or expensive to implement or are expected to have limited effectiveness in enhancing the impact (20% Confidence)
1.5	Moderate Risk (moderate confidence)	Measures can be implemented with some effort and cost and/or the measures can be effective in enhancing the impact if implemented (50% Confidence)
1.8	Low Risk (high confidence)	There is high confidence that mitigation measures can be implemented and can be effective in enhancing the impact (80% Confidence)

10.4 Motivation where no alternative sites were considered

Not applicable as alternatives layouts have been considered based on the mitigation of impacts. Alternatives considered are described in Section 7.

10.5 Statement motivating the alternative development location within the overall site

The project alternatives and the motivation for the selection of the preferred alternative is provided in Section 7. The preferred layout alternatives for the various project were provided.

10.6 Full description of the process undertaken to identify, assess and rank the impacts and risks the activity will impose on the preferred site (in respect of the final site layout plan) through the life of the activity

Please refer to Section 10.1 for the methodology used in the ranking of impacts. Please refer to Section 10.3 for the methodology used for the application of a mitigation confidence ranking to the impact ranking.

10.7 Assessment of each identified potentially significant impact risk

10.7.1 Impact Significance

NEGATIVE IMPACTS

≤1	Very low	Impact is negligible. No mitigation required.
>1≤2	Low	Impact is of a low order. Mitigation could be considered to reduce impacts. But does not affect environmental acceptability.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts. Mitigation should be implemented to reduce impacts.
>3≤4	High	Impact is substantial. Mitigation is required to lower impacts to acceptable levels.
>4≤5	Very High	Impact is of the highest order possible. Mitigation is required to lower impacts to acceptable levels. Potential Fatal Flaw.

POSITIVE IMPACTS

≤1	Very low	Impact is negligible.
>1≤2	Low	Impact is of a low order.
>2≤3	Moderate	Impact is real but not substantial in relation to other impacts.
>3≤4	High	Impact is substantial.
>4≤5	Very High	Impact is of the highest order possible.

10.7.2 Description of Tables

Table 10-5 to Table 10-27 below contains a summary of the outcome of the impact assessment conducted for all the infrastructure and activities associate with Kolomela and summarised in Section 4.3. The activities have been grouped as per characteristics, i.e. Waste Rock Dumps have been included in the same Table The Tables only contain the activities that were assessed as having a moderate significance rating prior to the application of mitigation measures. The mitigation measures listed in the tables are only the pertinent measures and a full set of mitigation have been included in Part B (EMPr). Refer to Annexure C of this report for the full impact assessment Tables.

TABLE 10-6: OPENCAST PITS, INCLUDING EVAPORATION DAMS

Impact Category	Aspect	Potential Impact	Mitigation	Kapstevel		Leeuwfontein and Klipbankfontein		Ploegfontein and Tierbult + roads	
				Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Removal of topsoil	Loss of soil and land capability	• Removal and protection of topsoil, • Stripping of topsoil only allowed in demarcated and approved footprints.	Moderate	Low	Low	Very low	Moderate	Low
Soil	Contamination of soil and soil stockpiles	Soil pollution		Moderate	Low	Low	Very low	Moderate	Low
Air quality	Blasting Haul trucks traveling on roads Exposed surfaces during pit development	Increased dust fall and PM emissions. Nuisance conditions	• Strict speed limits on all roads. • Dust retardant/binding agent on permanent haul roads and wet suppression on other roads. • Community grievances and complaints management procedure.	Moderate	Low	Moderate	Low	Moderate	Low
Noise	Movement of construction vehicles Drilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	• No blasting at night time as far as possible. • Controlled blasting . • Community and complaints management procedure.	Moderate	Low	Moderate	Low	Moderate	Low
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Implement a Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints.	Moderate	Low	Low	Low	High	Moderate
		Impact on floral SCC		Moderate	Low	Low	Low	Moderate	Moderate

Impact Category	Aspect	Potential Impact	Mitigation	Kapstevel		Leeuwfontein and Klipbankfontein		Ploegfontein and Tierbult + roads	
				Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation
	Encroachment of invader plant species		• Permits/licences in place prior to the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • IAIP management plan						
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	• Implement strict speed limits to prevent vehicles collision with animal. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site. • Implement Biodiversity management Plan	Moderate	Low	Low	Low	Moderate	Moderate
		Impact on SCC		Moderate	Low	Low	Low	Moderate	Moderate
Surface Water Resources	Extension of footprint	Destruction of additional wetland pans	• Prevent encroachment of wetland pans as far as possible. • Optimise footprint to minimise number of pans that will be impacted.	Moderate	Low	None		High	Moderate
Groundwater	Dewatering of aquifer	Potential impact on aquifer yield	• Monitor dewatering volumes. • Borehole level monitoring. • Continue with aquifer recharge.	High	Moderate	High	Moderate	High	Moderate

Impact Category	Aspect	Potential Impact	Mitigation	Kapstevel		Leeuwfontein and Klipbankfontein		Ploegfontein and Tierbult + roads	
				Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation
Heritage	Impact heritage sites	Impact on heritage resources	• Chance find procedure • Conduct phase 2 mitigation. Obtain destruction permit if required.	Very low	Very low	Moderate	Low	Moderate	Low
Visual	Visual appearance	Visual intrusion of facility	• Optimise backfilling • Dust suppression. • Construct a berm along the perimeter of the open pit	Moderate	Low	Moderate	Low	Moderate	Low
Land use and land capability	Footprint development	Loss of grazing land and change in land use	• Concurrent rehabilitation. • Implement land management plan.	Moderate	Low	Moderate	Low	Moderate	Low

TABLE 10-7: WASTE ROCK DUMPS

Impact Category	Aspect	Potential Impact	Mitigation	Leeuwfontein North		Leeuwfontein South		Kapstevel		Klipbankfontein	
				Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation		
Soil	Removal of topsoil	Loss of soil and land capability	• Implement a Procedure for the Removal of Topsoil, including Vegetation. • Stripping of topsoil only allowed in demarcated and approved footprints.	Moderate	Low	Low	Very low	Moderate	Low	Moderate	Low
Topography	Creation of WRD	Alteration of landscape	• Concurrent rehabilitation	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
Air quality	Blasting Haul trucks traveling on roads Exposed surfaces during pit development	Increased dust fall and PM emissions. Nuisance conditions	• Implement strict speed limits on all roads. • Dust retardant/binding agent on permanent haul roads and wet suppression on other roads. • Implement a community grievances and complaints management procedure.	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
Noise	Movement of construction vehicles Deposition of waste rock	Nuisance conditions for receptors in the area.	• Community and complaints management procedure.	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
Biodiversity - Flora	Vegetation clearance Encroachment of invader plant species	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Obtain relevant permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Implement offset strategy as agreed	High	Moderate	Low	Low	High	Moderate	High	Moderate
		Impact on floral SCC		High	Moderate	Low	Low	Moderate	Moderate	High	Moderate

Impact Category	Aspect	Potential Impact	Mitigation	Leeuwfontein North		Leeuwfontein South		Kapstevel		Klipbankfontein	
				Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation	Impact pre-mitigation	Impact post-mitigation		
			with relevant authority. • Implement AIP management plan								
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	• Implement strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low	Low	Low	High	Moderate	Moderate	Moderate
		Impact on SCC		Moderate	Low	Low	Low	Moderate	Moderate	Moderate	Moderate
Surface Water Resources	Runoff from WRD	Sedimentation of water courses	• Establish berms at the toe of the WRD.	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
Surface Water Resources	Extension of footprint	Destruction of additional wetland pans	• Prevent encroachment of wetland pans as far as possible. • Optimise footprint to minimise number of pans that will be impacted.	High	Moderate	Low	Low	No pans		High	Moderate
Surface Water Resources	Extension of footprint	Encroachment of drainage lines	• Prevent encroachment of drainage lines as far as possible. • Optimise footprint.	None		None		Moderate	Low	High	Moderate
Heritage	Impact heritage sites	Impact on heritage resources	• Implement a chance find procedure • Conduct phase 2 mitigation. Obtain destruction permit if required.	Moderate	Low	Low	Low	Moderate	Low	Low	Low
Visual	Visual appearance	Visual intrusion of facility	• Optimise backfilling • Dust suppression. • Concurrent rehabilitation.	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low
Land use and land capability	Footprint development	Loss of grazing land and change in land use	• Concurrent rehabilitation. • Implement land management plan.	Moderate	Low	Moderate	Low	Moderate	Low	Moderate	Low

TABLE 10-8: KAPSTEVEL DIVERSION BERM

Impact Category	Aspect	Potential Impact	• Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
	Encroachment of invader plant species	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes	Impact on faunal Habitat and Diversity	• Strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
	Earth works	Impact on SCC		Moderate	Low

TABLE 10-9: EXISITNG, NEW, AMENDED AND WIDENED HAUL ROADS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Removal of topsoil	Loss of soil and land capability	• Procedure for the Removal of Topsoil, including Vegetation. • Stripping of topsoil only allowed in demarcated and approved footprints.	Moderate	Low
Soil	Contamination of soil and soil stockpiles	Soil pollution		Moderate	Low
Noise	Movement of construction vehicles	Nuisance conditions for receptors in the area.	• No blasting at night time as far as possible. • Controlled blasting. • Community and complaints management procedure.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
	Encroachment of invader plant species	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes	Impact on faunal Habitat and Diversity	• Implement strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
	Earth works	Impact on SCC		Moderate	Low
Surface Water Resources	Extension of footprint over episodic drainage lines	Impact on episodic drainage line habitat	• Prevent encroachment of wetland pans as far as possible. • Optimise footprint to minimise number of pans that will be impacted.	Moderate	Low
Land use and land capability	Footprint development	Loss of grazing land and change in land use	• Concurrent rehabilitation. • Implement land management plan.	Moderate	Low

TABLE 10-10: DSO PROCESSING PLANT

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Air Quality	Crushing, screening and handling of ore	Increased dust fall and PM emissions. Nuisance conditions	• Implement strict speed limits on all roads. • Dust extraction and wet scrubber system. • Dust suppression on exposed areas during construction activities. • Implement a community grievances and complaints management procedure.	Moderate	Low
Surface Water Resources	Storage of hazardous substances	Spillages and pollution of stormwater	• Refer to section related to hazardous substances management in Part B (EMPr)	Moderate	Low
Surface Water Resources	Spillages from pollution control dams	Spillages and pollution of stormwater	• Ensure sufficient freeboard is available at all times. • Spillages to be reported and managed according to the incident management procedure. • Implement measures stipulated in the stormwater management plan.	Moderate	Low
Soil and Water Pollution	Waste management	Littering Environmental pollution	• Refer to section related to waste management in Part B (EMPr)	Moderate	Low
Visual	Night time activity	Light pollution and glare Impact on sense of place	• Use lightening that minimises glare and light spill. Investigate the use of yellow lights. • Shield lights where possible.	Moderate	Low
Resource use	Water and electricity usage	Depletion of natural resources	• Awareness training. • Water leaks must be reported and repaired timeously. • Optimise the reuse of water (i.e. treated sewage, water in PCDs, TSF process water). • Water spillages at the refilling station for the water bowsers must be avoided. • Investigate measures to optimise water use and saving. • Investigate the use of solar energy to supplement electricity obtained from fossil fuels. • Use of energy efficient lighting where possible.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
			• Awareness training.		
Resource use	Recycling of process water	Reduced dependency on water resources	• Optimise reuse of water	Moderate Positive	Moderate Positive

TABLE 10-11: PARK UP AREAS AND SOIL STOCKPILES

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Incorrect soil storage	Loss of soil integrity	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Soil stockpiles must be separated from park up areas"	Moderate	Low
Soil	Contamination of soil and soil stockpiles due to spills at park up area	Soil pollution		Moderate	Low
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
	Encroachment of invader plant species	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes	Impact on faunal Habitat and Diversity	• Strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
		Impact on SCC		Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
	Earth works				
Surface Water Resources	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Only one pan to be affected	• Prevent encroachment of wetland pans as far as possible. • Optimise footprint to minimise number of pans that will be impacted.	Moderate	Low
Land use and land capability	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected	• Concurrent rehabilitation. • Implement land management plan.	Moderate	Low

TABLE 10-12: DMS PROCESSING PLANTS: TIERBULT (OPERATIONAL) AND KAPSTEVEL (TO BE CONSTRUCTED) INCLUDING KAPSTEVEL CONVEYOR

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Removal of topsoil	Loss of soil and land capability	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Soil stockpiles must be separated from park up areas"	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Vegetation clearance Encroachment of invader plant species	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
		Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	• Implement strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
		Impact on SCC		Moderate	Low
Surface Water Resources	Construction of Klipbankfontein at pit facility Construction of Kapstevel conveyor	Destruction of additional wetland pans Change to wetland hydrological function	• Prevent encroachment of wetland pans and drainage lines as far as possible. • Optimise footprint to minimise number of pans and drainage lines that will be impacted. • Rehabilitate disturbed are at episodic drainage line. • Product spillages to be cleaned appropriately	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Extension of footprint of conveyor over episodic drainage lines Spillage of material from conveyor on episodic drainage lines	Impact on episodic drainage line habitat		Moderate	Low
Surface Water Resources	Spillages from dirty water managemen t facilities	Spillages and pollution of stormwater	• Ensure sufficient freeboard is available at all times. • Spillages to be reported and managed according to the incident management procedure. • Implement measures stipulated in the stormwater management plan.	Moderate	Low
Resource use	Recycling of process water	Reduced dependency on water resources	• Optimise reuse of water	Moderate Positive	Moderate Positive

TABLE 10-13: DSO TAILINGS STORAGE FACILITY

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Groundwater	Seepage into groundwater	Groundwater contamination	• Divert tailings process water to lined return water dam. • Groundwater quality monitoring	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Tailings spillages	Surface water contamination	• Clean up any tailings spillages. Large spillages logged as incidents.	Moderate	Low
Water Resources	Reuse of tailings water	Reduce dependency on water resources	• Optimise reuse of water	Moderate Positive	Moderate Positive

TABLE 10-14: CONVEYOR AND RAILWAY LINE FROM TIERBULT DMS PLANT

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
	Encroachment of invader plant species	Impact on floral SCC		Moderate	Low
Surface Water Resources	Product spillage	Sedimentation of water courses	• Erosion control measures must be implemented near water courses if necessary	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Footprint will be outside 32 m zone; however edge effects is anticipated	• Prevent encroachment of wetland pans and drainage lines as far as possible. • Optimise footprint to minimise number of pans and drainage lines that will be impacted. • Rehabilitate disturbed are at episodic drainage line. • Product spillages to be cleaned appropriately	Moderate	Low
	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Footprint will be outside 32 m zone; however edge effects is anticipated		Moderate	Low

TABLE 10-15: MAIN ADMINISTRATION, OFFICES AND WORKSHOPS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Storage of hazardous substances	Spillages and pollution of stormwater	• Refer to section related to hazardous substances management in Part B (EMPr)	Moderate	Low
Soil and Water Pollution	Waste management	Littering Environmental pollution	• Refer to section related to waste management in Part B (EMPr)	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Resource use	Water and electricity usage	Depletion of natural resources	• "Awareness training. • Water leaks must be reported and repaired timeously. • Optimise the reuse of water (i.e. treated sewage, water in PCDs, TSF process water). • Water spillages at the refilling station for the water bowsers must be avoided. • Investigate measures to optimise water use and saving. • Investigate the use of solar energy to supplement electricity obtained from fossil fuels. • Use of energy efficient lighting where possible. • Awareness training. • Reuse of process water.	Moderate	Low

TABLE 10-16: AT PIT FACILITIES (KAPSTEVEL AND KLIPBANKFONTEIN) INCLUDING ACCESS ROADS AND PARKING AREAS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Removal of topsoil	Loss of soil and land capability	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Soil stockpiles must be separated from park up areas"	Moderate	Low
Biodiversity - Flora	Vegetation clearance	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Restrict movement of vehicle to designated roads and footprints. • Offset strategy as agreed with relevant authority. • Implement AIP management plan	Moderate	Low
	Encroachment of invader plant species	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes	Impact on faunal Habitat and Diversity	• Implement strict speed limits to prevent animal strikes. • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
		Impact on SCC		Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
	Earth works				
Surface Water Resources	Bulk storage and use of hazardous substances. Refuelling station	Spillages and pollution of stormwater	• Refer to section related to hazardous substances management. • Refuelling to be conducted in a dedicated area with proper drainage in place. "	Moderate	Low
Surface Water Resources	Extension of footprint	"Destruction of additional wetland pans	• Prevent encroachment of wetland pans and drainage lines as far as possible. • Optimise footprint to minimise number of pans and drainage lines that will be impacted. • Rehabilitate disturbed are at episodic drainage line. • Product spillages to be cleaned appropriately	Moderate	Low

TABLE 10-17: EXPORT PIPELINE, ACCESS ROAD, RAILWAY LINE

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity	Movement barrier	Restrict animal movement Animal strikes	• Implement strict speed limits to prevent animal strikes. • Culverts should be installed (where practicable and if possible) along any drainage lines under roads and fences to allow for the movement of smaller species (particularly small mammals and reptiles).	Moderate	Low
Hydrology	Hydrology barrier	Flood risk during high rainfall events	• Clear obstacles from culverts.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Water resources	Water leakages from pipeline	Reduce dependency on water resources	• Fix any leaks timeously. Inspect pipeline for leaks.	Moderate	Low
Light pollution	Night time activities Lights at railway line	Glare and sky glow	• Investigate the shielding of lights • Direct light downwards	Moderate	Low

TABLE 10-18: BULK HYDROCARBON STORAGE, LDV AND LOCO REFUELLING AREAS, EXPLOSIVES MAGAZINE

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources and Soil	Storage and use of hazardous substances	Large scale spillages and pollution of stormwater/soil	• Refer to section related to hazardous substances management. • Refuelling to be conducted in dedicated area with stormwater measures in place to capture spillages. • Contaminated soil to be excavated and treated at the bioremediation facility. • Explosives to be stored in roofed buildings/enclosed structures. • Strict access control to explosives magazine."	High	Low
Groundwater	Potential leaks and seepage	Groundwater pollution	• Pressure tests on tanks. • Groundwater monitoring. • Store hazardous substances only in compatible containers/tanks. "	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Expansion of explosives magazine. Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Obtain relevant permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle to designated roads and footprints.	Moderate	Low

TABLE 10-19: EXPORT PIPELINE, ACCESS ROAD, RAILWAY LINE

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Air quality	Vehicle movement on unpaved road	Increased dust fall and PM emissions. Nuisance conditions	• Implement strict speed limits on all roads. • Dust suppression on unpaved roads	Moderate	Low
Fire management	Lack of fire breaks	Uncontrolled fires affecting neighbouring properties	• Ensure fire breaks are maintained. • Fire-fighting equipment must be readily available. • Ensure adequate communication with neighbours regarding fires.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Social	Lack of maintenance on fence	People gain access to fence	• Implement a fence maintenance agreement with adjacent land owners, which stipulates the roles and responsibilities of the parties involved and how the maintenance of fences will be managed.	Moderate	Low

TABLE 10-20: ARTIFICIAL AQUIFER RECHARGE PIPELINE

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Groundwater	Discharge into aquifer	Recharge aquifer and increase yield	• None	Moderate Positive	Moderate Positive
Biodiversity - Flora	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity Encroachment of areas not disturbed during construction.	• Prohibit movement into areas not disturbed by development. • Awareness training.	Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity Encroachment of areas not disturbed during construction.		Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Encroachment of Groenwaters pruit wetland system	Impact on wetland habitat		Moderate	

TABLE 10-21: LOW GRADE PRODUCT STOCKPILES AND WASTE TYRE YARD

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Vegetation removal for construction purposes Earth works	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle to designated roads and footprints. • Clear obstacles from culverts.	Moderate	Low
Biodiversity - Flora	Vegetation removal for construction purposes Earth works	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Footprint development	Impact on faunal Habitat and Diversity	• Strict speed limits to prevent animal strikes. • Awareness training regarding the presence of faunal species on site. • The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	Moderate	Low
Biodiversity - Fauna	Runoff from soil stockpiles	Impact on SCC		Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Extension of footprint	Disturbance of episodic drainage lines and cryptic wetlands	• Erosion control measures must be implemented on soil stockpiles close to episodic drainage lines. • Implement mitigated layout.	Moderate	Low
Surface Water Resources	Extension of footprint - edge effects	Sedimentation of water courses	• Prevent encroachment of wetland pans as far as possible. • Implement mitigated layout.	Moderate	Low
Safety	Stockpiling tyres	Fire hazard	• Appropriate firefighting equipment must be available at the facility • Fire breaks to be established and maintained"	Moderate	Low

TABLE 10-22: SEWAGE TREATMENT WORKS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Nuisance conditions	Inadequate management of facility	Nuisance conditions	• Only trained employees to operate sewage treatment works	Moderate	Low
Soil and stormwater pollution	Sewage spillages	Soil and water pollution	• Facility to be operated according to manual. • Enclosed system for discharge.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Water use	Reuse of treated sewage	Reduce dependency on water resources	• Optimise reuse of treated sewage effluent.	Moderate Positive	Moderate Positive

TABLE 10-23: EXPLORATION SITES

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Surface Water Resources	Storage and use of hazardous substances	Spillages and soil pollution	• Refer to section related to hazardous substances management	Moderate	Low
Biodiversity - Flora	Vegetation removal for construction purposes Earth works	Impact on floral Habitat and Diversity	• Procedure for the Removal of Topsoil, including Vegetation. • A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle to designated roads and footprints. • Clear obstacles from culverts.	Moderate	Low
Biodiversity - Flora	Vegetation removal for construction purposes Earth works	Impact on floral SCC		Moderate	Low
Biodiversity - Fauna	Footprint development	Impact on faunal Habitat and Diversity	• Strict speed limits to prevent animal strikes. • Awareness training regarding the presence of faunal species on site.	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Fauna	Runoff from soil stockpiles	Impact on SCC	• The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	Moderate	Low
Surface Water Resources	Extension of footprint	Disturbance of episodic drainage lines and cryptic wetlands	• Plan exploration sites to prevent encroachment of wetland pans as far as possible.	Moderate	Low

TABLE 10-24: SEWAGE TREATMENT WORKS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Nuisance conditions	Inadequate management of facility	Nuisance conditions	• Only trained employees to operate sewage treatment works	Moderate	Low
Soil and stormwater pollution	Sewage spillages	Soil and water pollution	• Facility to be operated according to manual. • Enclosed system for discharge.	Moderate	Low
Water use	Reuse of treated sewage	Reduce dependency on water resources	• Optimise reuse of treated sewage.	Moderate Positive	Moderate Positive

TABLE 10-25: PV SOLAR FACILITY

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Soil	Removal of topsoil	Loss of soil and land capability	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Soil stockpiles must be separated from park up areas	Moderate	Low
Soil	Contamination of soil and soil stockpiles	Soil pollution	• Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. • Good housekeeping must be applied to maintain high hygienic levels."	Moderate	Low
Surface Water Resources	Storage and use of hazardous substances	Spillages and soil pollution	Refer to section related to hazardous substances management	Moderate	Low
Air quality	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	• Dust suppression on exposed areas during construction activities. • Implement a community grievances and complaints management procedure. • Present monitoring results at Kolomela environmental forum.	Moderate	Low
Greenhouse gas emissions	Reduction in dependency on fossil fuel energy	Decreased carbon footprint	• None proposed	Moderate Positive	Moderate Positive

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Footprint development	Loss of avifaunal habitat, species and avifaunal SCC	• Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle to designated roads and footprints.	Moderate	Low
Biodiversity - Flora	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity		Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	• Bird nests on powerlines or the PV infrastructure are potential fire hazards and should be removed from structures regularly; and • Monitoring (every 2 months) should be undertaken for the 1st year and a record of potential bird strikes • Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Obtain relevant permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle to designated roads and footprints." • Strict speed limits to prevent animal strikes. • Awareness training regarding the presence of faunal species on site.	Moderate	Low
Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on SCC	• Strict speed limits to prevent animal strikes. • Awareness training regarding the presence of faunal species on site. • The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal	Moderate	Low

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
			species. Relevant permits should be obtained if any protected species are encountered.		
Biodiversity - Avifauna	Vegetation removal for construction purposes Earth works	Avifaunal Habitat and Diversity	• The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint; • Any structures which may act as perching sites for birds should be installed with anti-perching spikes; • Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the study area and may increase avian collisions or electrocutions; • Avifaunal habitat beyond the demarcated area should not be cleared or altered • No collection of avifaunal SCC or their eggs may be allowed by construction personnel; • No illicit / uncontrolled fires must be allowed during the construction phase of the proposed development.	Moderate	Low
Biodiversity - Avifauna	Vegetation removal for construction purposes Earth works	Avifaunal Species of Conservation Concern		Moderate	Low
Water Use	Water use for maintenance purposes	Increased pressure on water resources	• Optimise water use for cleaning of PV panels. • Investigate reuse of water.	Moderate	Low
Surface Water Resources	Increased surface water runoff volume and velocity	Erosion of adjacent areas and downstream episodic drainage lines	• Stormwater management to evenly dissipate runoff from the site.	Moderate	Low

TABLE 10-26: LTE TOWER AND RADIO MASTS

Impact Category	Aspect	Potential Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Biodiversity - Flora	Development of LTE towers. Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	• Only trained employees to operate sewage treatment works	Moderate	Low
		Impact on floral SCC	• Facility to be operated according to manual. • Enclosed system for discharge.	Moderate	Low

TABLE 10-27: SOCIO-ECONOMIC

Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Local procurement	Preferential local procurement plan. Kumba supplier development programme focussed on assisting local business to participate in procurement and implementation of projects. Non-localised contractors targets for local procurement and joint ventures.	High Positive	High Positive
Local employment	Preferential employment of person from local community. Upskilling of local persons to promote future employability. Contractor targets for preferential local employment	High Positive	High Positive

Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Catalyst for local economic development	Participation in the municipal IDP and LED Forums. Collaboration and engagement with local business organisations.	Very High Positive	Very High Positive
Enhancement of community training and skills levels	Investment is skills development and education centres in the local area. Investment in skills development programmes particularly in semi-skilled and technology-based vocations.	Moderate Positive	Moderate Positive
Enhanced infrastructure development	Collaboration with other businesses in assisting local municipality to improve local infrastructure.	High Positive	High Positive
Improved access to, and quality of school education	Continued support of local school infrastructure.	High Positive	High Positive
Improved access to, and quality of public healthcare services	Continued support of local health care facilities.	High Positive	High Positive
Support of the local municipality enhances service delivery	Continued support to the local municipality.	High Positive	High Positive
Pressure on municipal services and capacity due rapidly growing population	Continued support to local municipality.	High	Moderate

Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
A shortage of proper and affordable housing due to the demand created by mining (poor living conditions in informal settlements)	Kumba housing strategy.	High	Moderate
Dust, noise and dewatering impacting the farming community's quality of life and livelihoods	Strict speed limits on all roads. Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent on permanent haul roads and water suppression on other roads. Investigate the use of a product that is biodegradable and water efficient as far as possible. Dust suppression on exposed areas during construction activities. Controlled blasting according to a blasting procedure. Only use registered contractors with appropriate training for blasting. Dust fall monitoring according to the National Dust Control Regulations. PM 10 and PM 2.5 monitoring. Implement a community grievances and complaints management procedure. All complaints must be responded to and/or investigated. Present monitoring results at Kolomela environmental forum. Wet scrubber system to remove the dust from the crushing and screening processes at the DSO Processing Plant. Maintenance of scrubber system according to product specifications.	Moderate	Moderate

Impact	Mitigation	Impact pre-mitigation	Impact post-mitigation
Increase in social ills (e.g. crime, prostitution, substance abuse, teenage pregnancies) linked to population growth, poor living conditions, and contractors' employment practices	Continued support of, and collaboration with institutions and organisations involved in combatting social ills. Contractor social investment initiatives to assist with the support of institutions and organisations involved in combatting social ills.	Moderate	Moderate
Strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine	Engagement plan to ensure that stakeholders are being kept up to date with the project and the opportunities for local community members – management of expectations. Effective engagement with key stakeholders. Stakeholder Grievance Process (Tall to Us)	Moderate	Moderate
Increased traffic & consequences on road networks.	Geometric and structural upgrades of selected links. Some gravel roads may require surfacing and ones affected for short periods may require a more comprehensive maintenance plan including dust suppression. Responsibility should be shared between the developers and the road owners (provincial, municipal and private).	Moderate	Moderate

11. SUMMARY OF SPECIALIST REPORTS

The Table below contains a summary of the mitigation measures proposed by the specialists and also shows the measures that have been transferred to the Environmental Management Programme (Part B). The mitigation measures incorporated in the EMPr is based on the practical implementation thereof. It will allow the applicant to ensure that adequate mitigation is implemented from a practical and realistic point of view.

TABLE 11-1: SUMMARY OF SPECIALIST STUDIES AND RECOMMENDATIONS

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
Air Quality Impact Assessment (Airshed Planning Professionals, September 2021)	• The significance of the operational phase of the proposed Kolomela Mine operations were found to be moderate for all the scenarios identified. Assuming the adoption of good practice mitigation and management measures as recommended, the significance of impacts may be reduced to low. • It can be concluded that measures (dust suppression) aimed at reducing emissions from unpaved roads, wind erodible exposed areas and materials handling must be considered to most significantly reduce impacts on the environment. • Although Kolomela already implements some of these, and the dispersion modelling results incorporate some of these measures (for example wet suppression and chemical suppression on roads), the measures should form part of the management plan and should be regularly assessed to determine their effectiveness. • As the current exceedances are very season specific, these measures should be even more focused at these times of the year. • Continued ambient air quality monitoring, including: • Gravimetric sampling of PM10 and PM2.5 concentrations. • Dustfall sampling at existing locations around operations.	• Implement strict speed limits on all roads. • Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. Investigate the use of a product that is biodegradable and water efficient as far as possible. • Dust suppression on exposed areas during construction activities. • Controlled blasting according to a blasting procedure. Only use registered contractors with appropriate training for blasting. • Dust fall monitoring according to the National Dust Control Regulations. • PM10 and PM2.5 monitoring. • Implement a community grievances and complaints management procedure. All complaints must be responded to and/or investigated. • Present monitoring results at Kolomela environmental forum. • Wet scrubber system to remove the dust from the crushing and screening processes at the DSO Processing Plant. Maintenance of scrubber system according to product specifications. **Vehicle emissions** • Regular servicing of vehicles. • Prevent unnecessary idling of trucks. **WRD**

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
		• Dust suppression on WRDs by spraying water. • Concurrent rehabilitation of WRD.
Noise Impact Assessment (Airshed Planning Professionals, August 2021)	The significance of the operation phase of Kolomela Mine operations were found to be moderate. Assuming the adoption of good practice noise mitigation and management measures, the noise impacts from the surface mining and ore processing plant may be reduced but will remain at a moderate significance due to the location of NSR16 to the Kapstevel mining area. NSR16 is a farm owned by the Kolomela Mine. If noise levels due to the project exceed the IFC guidelines and become an annoyance at NSR16 after mitigation measures have been implemented, consideration should be given to relocating the residences at this site.	• Implement strict speed limits on all Kolomela roads. • No blasting at night-time as far as possible. • Communicate blasting times to relevant stakeholders, only when blast occur close to Klipbankfontein farmstead. • Controlled blasting according to a blasting procedure. Only use registered contractors with appropriate training for blasting. • Implement a community and complaints management procedure. All complaints must be responded to and/or investigated. • Conduct summer and winter environmental noise monitoring. • Prevent unnecessary idling of trucks. • All diesel-powered equipment and plant vehicles should be kept at a high level of maintenance. This should particularly include the regular inspection and, if necessary, replacement of intake and exhaust silencers. Any change in the noise emission characteristics of equipment should serve as trigger for withdrawing it for maintenance

Floral Assessment (Scientific Terrestrial Services, August 2021)	Prior to mitigation measures implemented, the impact significance on the floral habitat and diversity within the focus area was deemed to range between medium-low and low for the Rocky Habitat, between high and very low. With mitigation measures implemented, the direct and indirect impacts on the floral habitat and diversity for the focus area can be reduced to medium-low and very low significance levels. For the impacts associated with SCC, prior to the implementation of mitigation measures, the impact significance was deemed to range between medium-high and very low across the focus area. With the implementation of mitigation measures, the direct and indirect impacts on the SCC communities for the focus area can be reduced to medium-low and very low significance levels. Recommendations were developed and included in Section 5.4 of the floral assessment to address and mitigate impacts associated with the proposed projects. These recommendations also include general management measures which apply to the proposed projects as a whole. Mitigation measures have been developed to address issues in all phases throughout the life of the projects from planning, through to construction and operation.	• Awareness training. • Planning of temporary roads and access routes should take the site sensitivity plan into consideration. • Procedure for the Removal of Topsoil, including Vegetation. • Remaining wetland pans must be dedicated no-go areas. • A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. A walk through must be conducted to identify the protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle and people to designated roads and footprints. • Implement offset strategy as agreed with relevant authority. • Access roads should be kept to existing roads so to reduce fragmentation of existing natural habitat and should, where possible, be restricted to areas within the existing Transformed Habitat • Implement measures as stipulated in the Kolomela land management plan to ensure that properties on Kolomela and other SIOC owned properties are managed to achieve an outcome which is based on goal oriented biodiversity management. • No illicit fires must be allowed during the construction of the proposed development. • Fire breaks should be maintained during the construction and operational phases. • Refer to sections related to hazardous substances and waste management. • Continue with biomonitoring. • Refer to section related to dust control. • Refer to section related to fire management.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
Faunal Assessment (Scientific Terrestrial Services, July 2021)	Overall, the perceived impact significance of the proposed development (prior to mitigation) on faunal habitat, diversity and SCC range from medium high to low for all habitats within the focus area. With mitigation measures impacts can be reduced to lower levels in most cases. As impacts cover relatively large areas the impacts scores are relatively high, yet as a result of the footprint adjacent historic or current infrastructure no regional impacts are anticipated. The potential for large scale impacts is unlikely if recommended mitigation measures are adhered to. Recommendations were developed and included in Section 5.3 of the floral assessment to address and mitigate impacts associated with the proposed projects. These recommendations also include general management measures which apply to the proposed projects as a whole. Mitigation measures have been developed to address issues in all phases throughout the life of the projects from planning, through to construction and operation and have been integrated in the development of the EMPr.	• Implement strict speed limits to prevent animal strikes. • Culverts should be installed (where practicable and if possible) along any drainage lines under roads and fences to allow for the movement of smaller species (particularly small mammals and reptiles). • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site. • The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered. • Implement measures as stipulated in the Kolomela land management plan to ensure that properties on Kolomela and other SIOC owned properties are managed to achieve an outcome which is based on goal oriented biodiversity management. • No illicit fires must be allowed during the construction of the proposed development. • Fire breaks should be maintained during the construction and operational phases. • Continue with biomonitoring at Kolomela.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
Freshwater Ecological Assessment (Scientific Aquatic Services, July 2021)	Assuming that responsible implementation of the mitigation hierarchy (as contained in Appendix F), as well as strict adherence to cogent, well-developed mitigation measures takes place throughout all phases of the proposed mining development, the significance of potential impacts arising from the proposed mining activities is deemed to be of low to moderate levels, depending on the nature and extent of the activity. Whilst it is recommended that where possible, infrastructure be re-aligned (e.g., the proposed conveyors) or optimised (e.g., the exploration core yard expansion) to reduce the footprint and thus avoid encroachment on watercourses, it is acknowledged that this may not always be practical due to space or topographic limitations. Provided that strict implementation of cogent, well-developed, site-specific mitigation measures takes place throughout all phases of the proposed mining expansion, it is the specialist's opinion that the proposed expansion may be considered for authorisation.	• Implement mitigated layout to minimise disturbance of water courses. • Runoff from dirty areas must be captured and diverted to a sump or pollution control dam. • Servicing of vehicles to be conducted in dedicated areas with measures in place for the containment of runoff. • Refer to sections regarding the management of hazardous substances and waste. • Implement mitigated layout plan to avoid wetland pans as far as possible. • Implement stormwater control measures close to water courses. • Restrict movement outside demarcated areas, especially close to water courses. • Biomonitoring in episodic drainage lines. • Install dissipating structures (such as gabions) at stormwater discharge points, where necessary or where erosion is evident. • Sloping and concurrent rehabilitation of WRDs will reduce potential sediment runoff. • Berms along haul roads to control sediment runoff. • Install berms < 50 meters downstream from ore stockpiles that are situated near water courses. • Stripping of topsoil only allowed in demarcated and approved footprints. • Implement topsoil management procedure. • Angle of repose to be used for stockpile development and disturbance of stockpiles must be limited to preserve the soil integrity. • Topsoil stockpiles that will be stored for < 2 years may not exceed 2 meters and older stockpiles can exceed 2 meters, however no equipment will be allowed on top of stockpiles for any reason including deposition of soil. • Implement measures stipulated in the Kolomela Stormwater Management Plan.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
Heritage Impact Assessment (PGS Heritage, October 2021)	**General project area** • Implement a chance find procedures in case where possible heritage finds are uncovered. **Burial Grounds and Graves (KOL 4.2, KOL 4.4 and KME-01) that were rated as high local heritage significance and had a heritage grading of IIIA.** • KOL 4.2 and KOL 4.4 (the graves that form part of the historic farmyard complex (KOL 4)): A minimum buffer of 250 meters from any mining activities (e.g. blasting) must be maintained. • KME-01: The graves should be demarcated with a 100-meter buffer and should be avoided and left in situ. • A Grave Management Plan should be developed for the graves which also need to be approved by SAHRA BGG. • If the site is going to be impacted and the graves need to be removed a grave relocation process as per the Kolomela Heritage Management Plan for the site is recommended as a mitigation and management measure. **Historical sites (KOL 3 and KOL 4) that were rated as high local heritage significance and had a heritage grading of IIIA.** • KOL 3 - A 400 meter buffer must be maintained between the site and any proposed development. • KOL 4 - A minimum buffer of 250 meters from any mining activities must be maintained. **Archaeological pan sites (KOL 1, KOL 5, KOL 6, KOL 7, KOL 8) were rated as low to medium local heritage significance and had a heritage grading of IIIB/IIIC.**	**KOL 1 Stone Age Sites** • Phase 2 mitigation is proposed under a permit issued by the SAHRA. • Phase 2 mitigation include representative sampling of the assemblages on pans that will be impacted by extension activities. • Implement Chance Find Procedure (CFP) during extension activities. • Permit required in terms of Section 35 of NHRA prior to disturbance. • A 30 meter buffer around the remaining features must be kept util such a time as a destruction permit is issued. **KOL 2 Stone Age Sites** • Implement CFP during extension activities **KOL 3 Historic Mine** • A buffer area of 400m must be maintained around the site and be kept clear of development. • The buffer zone must be clearly demarcated. • Should the need arise for the above-mentioned buffer area of 400m to be reduced, Phase 2 excavations would be required under a permit issued by the SAHRA. • Conduct adequate consultation with SAHRA proactively should future activities encroach on the buffer area. • Permit required in terms of Section 35 of NHRA prior to disturbance. **KOL 4 Historic farmstead** • Maintain a 250 m buffer area between the WRD/any development and the farm worker burial ground at KOL 4.4 • Maintain at least a 100 m buffer area between the WRD/any development and the areas rated as high sensitivity. • The buffer zone must be clearly demarcated.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
	• A general buffer of 30 meters for the remaining pan sites are recommended. • Phase 2 mitigation (representative sampling) on certain pans will be required before they are destroyed by mining activities. This will require a permit issued by the South African Heritage Resources Agency (SAHRA).	• The above buffers must be considered when planning the clean water diversion canal. The route of the diversion canal must be reviewed and revised to prevent impacts. • Site KOL4 is to be protected as per the above measures. Should this not be possible in future planning, the relevant permits in terms of section 34, 35 and 36 of the NHRA must be applied for. • The site must be monitored by a heritage professional on a regular basis and the status of the site must be documented and records kept on file. **KOL 5-KOL8 Stone Age Pans** • Identify pans outside the development footprint and a 30 meter buffer around the remaining features must be kept until such time as a destruction permit is granted. • Implement CFP. **KME-01 Burial ground** • The graves should be demarcated with a 100-meter buffer and that the graves should be avoided and left in situ. • A Grave Management Plan should be developed for the graves which also need to be approved by SAHRA BGG • If the site is going to impacted and the graves need to be removed a grave relocation process for site KME-01 is recommended as a mitigation and management measure.
Visual Impact Assessment (EXM Environmental Advisory October 2021)	Based on the findings from the assessment, it is anticipated that the existing and proposed expansion will have a moderate to high visual impact on the immediate receiving environment. The highest visual impact will come from infrastructure that will have a high height and large footprint; the infrastructure will stand out against the natural landscape.	• Concurrent rehabilitation of Waste Rock Dumps. • Apply dust suppression methods on haul roads. • Only conduct activities in demarcated approved areas. • To ensure that all mitigation and management actions outlined in the closure and rehabilitation report are conducted. • Limit the height of the WRD and stockpiles to not exceed the predetermined height. • Optimise backfilling.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
	The impact assessment shown that the impacts for the construction phase will have a minor negative significance before mitigation and negligible negative significance after mitigation. For the operational phase the impact will have a moderate negative significance before mitigation and minor negative significance after mitigation. The decommissioning and rehabilitation phase will remain at a minor negative significance for both before and after mitigation. The summary of the mitigation measures are provided in Table 12-1 of the Visual Impact Assessment	• Security lighting to be positioned downwards and inwards. • Lights directed away from receptors.
Geohydrological Assessment (Gradient Consulting, September 2021)	**Operations** • To prevent the reduction in groundwater yield in private boreholes the following are recommended: • Clean and dirty runoff should be separated, and dirty water should be contained in an adequately sized Pollution Control Dam (PCDs) or Return Water Dam as per GN704 regulations. • Clean runoff should be released back into the catchment. • Groundwater levels should be monitored on-site as well as on private farms around the mine. • Results from ongoing groundwater monitoring should be used to update the mine water balance and groundwater model, as required. • A replacement water supply strategy needs to be prepared for impacted groundwater users. **Closure** • Groundwater monitoring results should be used to plan for mine closure.	• Groundwater levels should be monitored on-site as well as on private farms around the mine. • Results from ongoing groundwater monitoring should be used to update the mine water balance and groundwater model, as required. • Clean and dirty runoff should be separated, and dirty water should be contained in an adequately sized Pollution Control Dam (PCDs) or Return Water Dam as per GN704 regulations. • Continue with artificial recharge of aquifer. • Groundwater monitoring results should be used to plan for mine closure. • Ongoing groundwater monitoring after mining has ceased for a specific time period to establish post-closure trends. • The numerical groundwater flow and transport model should be updated prior to closure to confirm predicted impacts. • Based on results from the model update a post-closure monitoring programme may need to be established.

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
	• Ongoing groundwater monitoring after mining has ceased for a specific time period to establish post-closure trends. • The numerical groundwater flow and transport model should be updated prior to closure to confirm predicted impacts. • Based on results from the model update a post-closure monitoring programme may need to be established.	
Avifaunal Impact Assessment (Scientific Terrestrial Services, August 2021	Based on the findings of the avifaunal assessment, it is the opinion of the ecologists that from an avifaunal perspective, the proposed development will have medium low to low impacts on the receiving environment prior to the implementation of mitigation measures. With mitigation impacts scores can be reduced can be reduced to low and very low levels in most cases. Development within portions of Tarchonanthus - Senegalia Thornveld will result in medium low both with and without mitigation as natural habitat with the potential to support several SCC will be transformed. Although a large contingent of SCC anticipated to occur within the study area no breeding is anticipated for these species. All mitigation measures and recommendations presented in Section 6.4 should be adhered to as to ensure the avifaunal ecology within the proposed development areas along with the surrounding habitat is protected or adequately rehabilitated, where necessary, in order to minimise the deviations in levels of ecosystem functions and processes.	• The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint; • Any structures which may act as perching sites for birds should be installed with anti-perching spikes; • Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the study area and may increase avian collisions or electrocutions; • Avifaunal habitat beyond the demarcated area should not be cleared or altered • No collection of any avifaunal may be allowed by construction personnel; • No illicit / uncontrolled fires must be allowed during the construction phase of the proposed development.
Hydropedological Assessment (Zimpande, October 2021)	• Although some wetlands will be directly impacted, all development footprint areas to remain outside of the wetlands and associated scientific buffer as far as practically possible.	• Management measures as per the Aquatic Mitigation Measures

Specialist	Key outcomes and recommendations	Recommendations Included in the EMPR Report (Part B)
	• Contractor laydown areas, and material storage facilities to remain outside of the cryptic wetlands, as well as the applicable scientific buffer. • The watercourses must be protected against erosion arising from the stormwater runoff from the associated infrastructural areas. In this regard, runoff should be attenuated before discharging into the wetland, thus recharging the wetlands in an ecologically appropriate manner. • Implementation of strict erosion control measures to limit loss of soil and sedimentation of the wetlands adjacent to the proposed project. • All surface development footprint areas should remain as small as possible and disturbance of soil profiles to be limited to what is absolutely essential. • Following the completion of the construction phase, areas of disturbance, particularly adjacent to the watercourse should be monitored at least once after an erosive rainfall until the natural vegetation has well established.	

12. ENVIRONMENTAL IMPACT STATEMENT

12.1 Summary of Key Findings of the Environmental Impact Assessment

The following have been identified as the key findings of the impact assessment:

12.1.1 Social Impacts

12.1.1.1 Positive impacts

Kolomela mine contributes significantly to the local and regional social economic environment in terms local employment, local procurement and the support of local businesses. In addition, Kolomela provides support to the local municipality, other government organisations such as health care services as well as organisations and institutions associated with assisting with social ills.

12.1.1.2 Negative impacts

Kolomela mine contributes to the influx of persons into the community. The rapid growth in the population as resulted in pressure on municipal services and capacity, social and health care services, schools and a demand for houses. There has been an expansion of informal settlement due to a shortage of proper and affordable housing and many people live in very poor conditions. High levels of unemployment, particularly in the youth means an increase in social ills (e.g. crime, prostitution, substance abuse, teenage pregnancies). Strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine. The rapid population growth mean increased traffic & consequences on road networks.

12.1.2 Noise

Noise generation associated with Kolomela (i.e. blasting and vehicle movement) has the potential to result in nuisance conditions for surrounding receptors. According to the Noise Impact Assessment, only one receptor situated on a SIOC property may potentially be negatively affected close to the Kapstevel operations and the impacts associated with noise generation was assessed to have a moderate significance rating. Kolomela should continue with noise monitoring to ensure that noise levels remain within the relevant standards and additional mitigation may be required if increased levels are detected.

12.1.3 Water Courses (Wetlands and Drainage Lines)

The impact on water resources should be viewed from a cumulative perspective (current and planned infrastructures) and the risk assessment took into account the cumulative effect of Kolomela as a whole. Infrastructure and activities associated with Kolomela mine has caused and will cause the destruction of and indirect impacts on several wetland pans as well as episodic drainage lines. This is especially evident in the development of the Ploegfontein pits,

the Klipbankfontein WRD, the extension of the Leeuwfontein WRD and development of haul roads. The significance rating was high for impacts associated with this infrastructure. Other infrastructure (i.e. Kapstevel DMS conveyor, waste tyre management facility, DSO conveyor and railway spur, low grade stockpiles, expansion of the exploration core yard) will also potentially result in impacts on water courses, but to a lesser extent especially if the mitigated layout alternatives are implemented. It is essential that adequate planning must be implemented during infrastructure development to minimise impacts on water courses at Kolomela.

12.1.4 Biodiversity - flora

The impact on biodiversity should be viewed from a cumulative perspective (current and planned infrastructures) and the risk assessment took into account the cumulative effect of Kolomela as a whole. Development of infrastructure at Kolomela will entail the removal of natural vegetation. This will result in a loss of flora habitat and a loss of floral diversity. Kolomela must ensure that the remaining natural areas are managed and no further encroachment allowed. Development of infrastructure at Kolomela will also impact on floral Species of Conservation Concern (SCC). Permits must be obtained for the removal of such species. The proposed development will not impact on any threatened ecosystems. The development will, however, impact on CBA1 and ESA habitat (particularly within the central section of the focus area. The perceived impact significance of the Kolomela (prior to mitigation) on CBAs, ESAs, and Protected Areas flora habitat, diversity and SCC range from medium high to low. With mitigation measures implemented, the direct and indirect impacts on the floral ecology for the focus area may be reduced to medium-low and very low levels for all the phases associated with the proposed development.

12.1.5 Biodiversity - fauna

The impact on biodiversity should be viewed from a cumulative perspective (current and planned infrastructures) and the risk assessment took into account the cumulative effect of Kolomela as a whole. The perceived impact significance of Kolomela (prior to mitigation) on faunal habitat, diversity and SCC range from medium high to very low. The potential for local or regional impacts are unlikely if recommended mitigation measures are adhered to. If effective mitigation takes place at all stages of the proposed project, most of the impacts may be reduced to a lower significance rating. The most prominent threat to the faunal ecology within the focus area is the proposed development within the portions of natural Mountain Bushveld, Calcrete and Thornveld habitats. Impacts to SCC are anticipated as the focus area offers suitable habitat in terms of foraging and/or breeding for several SCC.The impacts associated with the PV solar facility on avifaunal SCC are of medium low to low significance levels, with

higher impact significance activities occurring as a result of the establishment of the transformation of the Tarchonanthus - Senegalia Thornveld. This activity will likely result in a decrease in avian richness and abundance of SCC within the study area. If effective mitigation takes place, most impact may be reduced to lower significance levels.

12.1.6 Groundwater

According to Gradient (2021), it is expected that the groundwater drawdown during the Kolomela LOM within the existing monitoring as well as neighbouring and private boreholes will range between 3.0m (regional) to 50.0-100 mbsl (meters below static level) within close proximity to the pit footprints. It should be noted that the majority of properties being intercepted by the drawdown zone are owned by SIOC, however there are privately owned properties being impacted on as well especially towards the northern and eastern perimeters. It should also be noted that the zone of impact does reach various boreholes which is current being utilised. The impact assessment (impact ratings) indicates moderate to high impacts on local and regional aquifers as a result of mine dewatering impacts from the Klipbankfontein, Leeuwfontein and Kapstevel opencast pits. Water quality impacts as indicated by the pollution plume models are rated as being mostly low to very low from the waste rock dumps and planned co-disposal facilities.

12.1.7 Land use

Current as well as future infrastructure development especially the pits and WRDs at Kolomela will result in a change of land use and reduce the capability of the land to provide grazing or other purposes. Although the infrastructure will cause a change in land use and capability, Kolomela has a very extensive land management plan in place in which the mine will enhance the capability of the remaining natural areas (with reference to the conservation areas) within the mining right as well as other SIOC owned properties in the surrounding areas.

12.1.8 Soil

The storage and handling of hazardous substances (i.e. hydrocarbons) at Kolomela during and construction and operational activities may result in spillages and soil pollution. Runoff from disturbed areas during construction may result in soil erosion and loss of topsoil. Soil compaction may also result in impacts on soil characteristics and land capability, especially adjacent areas. The establishment of pits and WRD (as well as other infrastructure) will entail the removal and stockpiling of topsoil to be used for rehabilitation purposes. This must be done correctly to ensure the integrity of the stockpiles for use in rehabilitation.

12.1.9 Disturbance of Heritage Resources

- An assessment of the possible impacts of the proposed project on graves and burial grounds has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative.
- An assessment of the possible impacts of the proposed project on historical heritage resources has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative.
- An assessment of the possible impacts of the proposed project on the previously identified archaeological pan sites has shown that unmitigated impacts consist of a moderate negative impact. By implementing the mitigation measures as listed in this report these impacts can be managed to low negative.

12.1.10 Road Safety and Traffic Disturbance

It is anticipated that the total traffic will increase by 10% by the year 2028. This will affect user experience. In addition, there may be structural damage to local roads. It is proposed that upgrades be undertaken to alleviate the impact. These include geometric and structural upgrades of selected links. Some gravel roads may require surfacing and ones affected for short periods may require a more comprehensive maintenance plan including dust suppression. Responsibility should be shared between the developers and the road owners (provincial, municipal and private). Alternative routes can also be investigated.

12.2 Final site map

The final site layout maps (Mitigated Scenario) is presented in the figure below which includes the mitigated layouts as per Section 7 of this report.

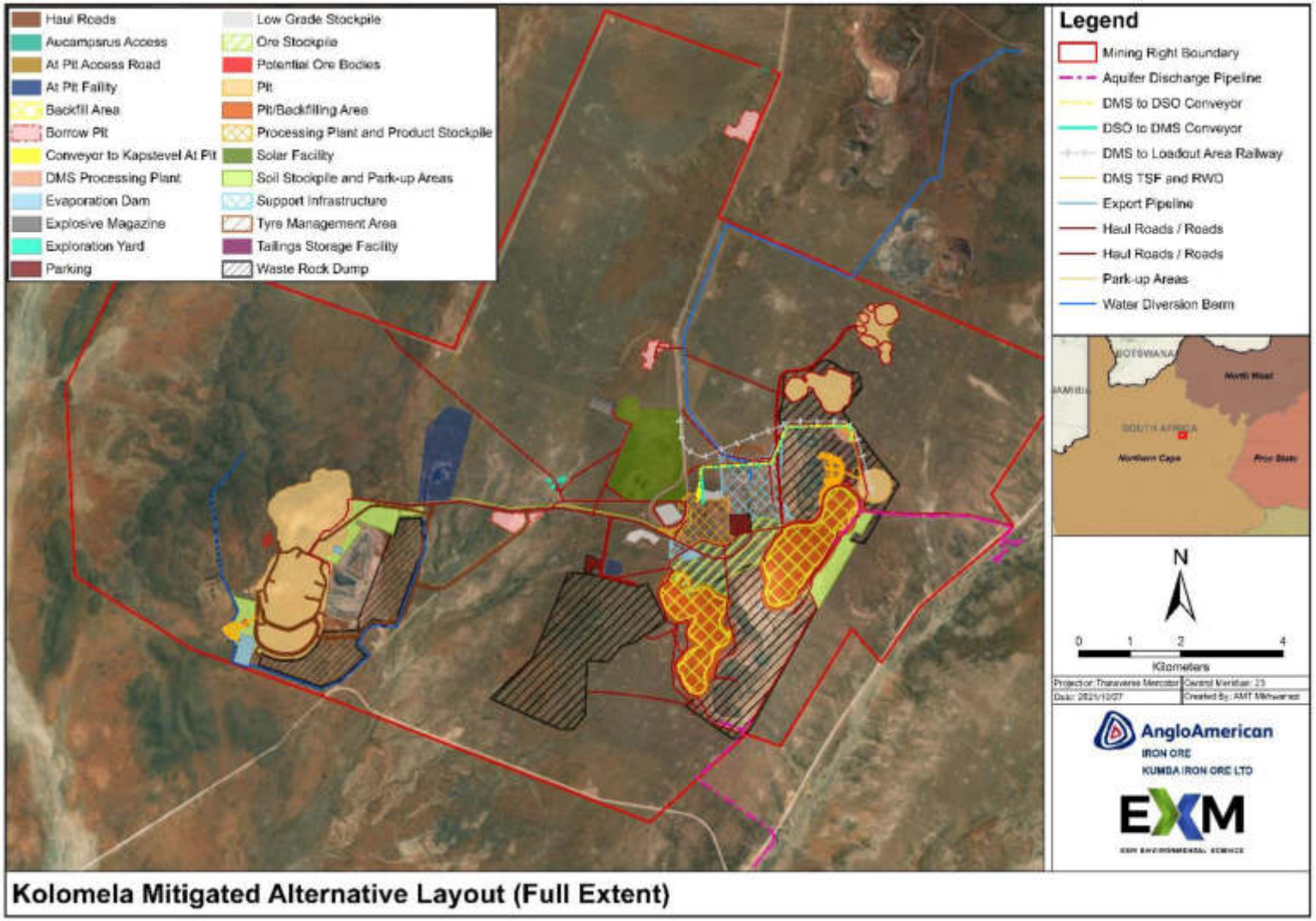


FIGURE 12-1: MITIGATED FINAL LAYOUT

12.3 Summary of the positive and negative implications and risks of the proposed activity and identified alternatives

TABLE 12-1: SUMMARY OF KEY POSITIVE AND NEGATIVE IMPACTS IDENTIFIED FOR THE CONSTRUCTION PHASE

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
Biodiversity - Flora	Vegetation clearance Ploegfontein and Tierbult Pits Leeuwfontein North Kapstevel Klipbankfontein WRDS	Impact on floral Habitat and Diversity Impact on floral Species of Conservation Concern (SCC)	High	• Procedure for the Removal of Topsoil, including Vegetation. • A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. • Vegetation clearance only allowed in demarcated and approved footprints. • Permits for the removal of protected species. • Concurrent rehabilitation of areas temporarily disturbed by construction activities. • Restrict movement of vehicle and people to designated roads and footprints. • Implement offset strategy as agreed with relevant authority.	Moderate
Biodiversity - Fauna	Vegetation clearance Kapstevel WRD in Mountain Busveld Habitat Unit	Impact on floral Habitat and Diversity Impact on floral Species of Conservation Concern (SCC)	High	• Strict speed limits to prevent animal strikes. • Culverts should be installed (where practicable and if possible) along any drainage lines under roads and fences to allow for the movement of smaller species (particularly small mammals and reptiles). • No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. • Awareness training regarding the presence of faunal species on site. • The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	Moderate

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
Avifaunal (birds)	Development of PV solar facility	Impact on avifaunal Habitat and Diversity Impact on avifaunal SCC	Moderate	• The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint; • Any structures which may act as perching sites for birds should be installed with anti-perching spikes; • Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the study area and may increase avian collisions or electrocutions; • Avifaunal habitat beyond the demarcated area should not be cleared or altered • No collection of any avifaunal may be allowed by construction personnel; • No illicit / uncontrolled fires must be allowed during the construction phase of the proposed development.	Low
Soil	Removal of topsoil during all developments	Loss of soil and land capability	Moderate	• Procedure for the Removal of Topsoil, including Vegetation. • Plan soil stockpile positions according to future development footprints to prevent further disturbance. • Stripping of topsoil only allowed in demarcated and approved footprints. • Topsoil management procedure. • Angle of repose to be used for stockpile development and disturbance of stockpiles must be limited to preserve the soil integrity. • Topsoil stockpiles that will be stored for < 2 years may not exceed 2 meters and older stockpiles can exceed 2 meters, however no equipment will be allowed on top of stockpiles for any reason including deposition of soil. • Topsoil stockpiles must be separated from areas with the potential to cause pollution, i.e. use berms to separate areas. • Any contaminated soil must be excavated, placed in a designated, labelled skip and taken to the bioremediation facility for treatment. The treated soil can be used for rehabilitation purposes, after quality monitoring has been conducted.	Low

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
Surface water – Wetland Pans	Ploegfontein and Tierbult Pits Leeuwfontein North Klipbankfontein Construction of haul roads	Total or partial loss of wetland pans and or the associated catchments. Disturbance of episodic drainage lines.	High	• Implement mitigated layout plan to avoid wetland pans as far as possible. • Implement stormwater control measures close to water courses. • Restrict movement outside demarcated areas, especially close to water courses. • Biomonitoring in episodic drainage lines.	Moderate
Groundwater	Dewatering of aquifer	Potential impact on aquifer yield	High	• Continue with groundwater monitoring (levels) • Continue monitoring of dewatering volumes. • Engage with stakeholders at the Kolomela Environmental Forum. • Update groundwater model yearly.	Moderate
Air quality	Blasting Haul trucks traveling on roads Exposed surfaces DSO Plant	Increased dust fall and PM emissions. Nuisance conditions	Moderate	• Strict speed limits on all roads. • Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. Investigate the use of a product that is biodegradable and water efficient as far as possible. • Dust suppression on exposed areas during construction activities. • Controlled blasting. Only use registered contractors with appropriate training for blasting. • Dust fall monitoring according to the National Dust Control Regulations. • PM 10 and PM 2.5 monitoring. • Community grievances and complaints management procedure. All complaints must be responded to and/or investigated. • Present monitoring results at Kolomela environmental forum. • Wet scrubber system to remove the dust from the crushing and screening processes at the DSO Processing Plant. Maintenance of scrubber system according to product specifications.	Low
Noise	Movement of vehicles	Nuisance conditions for	Moderate	• Implement strict speed limits on all Kolomela roads. • No blasting at night time as far as possible.	Low

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
	Drilling and blasting Material handling and deposition Deposition of waste rock	receptors in the area.		• Communicate blasting times to relevant stakeholders, only when blast occur close to Klipbankfontein farmstead. • Controlled blasting according to a blasting procedure. Only use registered contractors with appropriate training for blasting. • Community and complaints management procedure. All complaints must be responded to and/or investigated. • Conduct summer and winter environmental noise monitoring.	
Heritage	Establishment of footprints	Destruction of heritage resources	Moderate	Implement actions as per Cultural Heritage Management Plan	Low
Greenhouse gas emissions	Generation of electricity at the solar PV facility	Reduction in dependency on fossil fuel energy Decreased carbon footprint	Moderate positive	None proposed	Moderate positive
Social	Pressure on municipal services A shortage of proper and affordable housing Increase in social ills Strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine	Negative social consequences	Moderate to high	• Capacity building and support initiatives to alleviate pressure on the municipality. • Housing policy and building of additional houses (including rental stock) for employees • Planned programmes and initiatives to enhance social wellness in Tsantsabane through continued support of, and collaboration with institutions and organisations involved in combatting social ills.	Moderate

IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	SIGNIFICANCE WITH MITIGATION
Socio-economic	Local procurement and enterprise development Local employment Catalyst for local economic development Enhancement of community skills levels Enhanced infrastructure development Improved access to, and quality of school education	Contribution to local economic development	High Positive	• Preferential procurement plan. Kumba supplier development programme. • Social and Labour Plan commitments and implementation of the mine's local recruitment policy. Collaboration with the municipality's unemployment forum. In addition: Local employment commitments from contractors and monitoring thereof. • Participation in the municipal IDP and LED Forums. Collaboration and engagement with local business organisations. In addition: Encouraging contractors and other service providers to recruit and procure locally. Collaboration with regional LED structures to enhance economic development in the Gamagara Corridor. • Promote the Kolomela Community Skills Centre in local communities. Bursary scheme. Scholarship scheme. Internship programme. Investigations to establish a technical subjects section at Postmasburg secondary school. Investigations on the establishment of an FET satellite campus in Postmasburg. In addition: Require specific skills development interventions from contractors. • SLP commitments, aligned with the municipal IDP TSASSAMBA Public Private Partnership with Beeshoek mine and Tsantsabane Local Municipality • SLP and CSI projects focusing on education. Effective engagement with the relevant levels of government when implementing projects. In addition: Agreements with largest contractors to also contribute to education projects, in coordination with Kolomela's planned initiatives. Regular needs assessment at schools.	High Positive

12.4 Proposed management objectives and the impact management outcomes for inclusion in the EMPr

The key mitigation measures to be included in the EMPr are as follows:

- Implementation of project layout as per Mitigated Scenario. The construction footprint must be clearly demarcated according to the mitigated layout and activities must be restricted to the predetermined footprint.
- The sensitive habitats, including the wetland pans and episodic drainage lines (not impacted by development footprints), must be established as no-go areas.
- Implement a procedure for the clearance of vegetation and topsoil.
- Obtain permits for the removal of protected species from the relevant authority.
- Implement a biodiversity offset strategy as agreed with relevant authority.
- Continue with groundwater (levels) monitoring and update the dewatering model every second year to ascertain impacts associated with aquifer yield.
- Implement a stormwater management plan which addresses potential erosion and spill management at Kolomela to prevent impacts on water resources.
- Optimise aquifer recharge.
- SIOC must implement measures to ensure that appropriate land management is implemented at Kolomela and other SIOC owned properties.
- Enhance socio-economic benefits from a local perspective through preferential local employment and procurement. Such measures must also be implemented by contractors working at Kolomela mine.
- Implement measures for the upskilling and training of local persons to make them more employable in the current and future economy including post mien closure.

12.5 Final proposed alternatives

See Section 7 for the final proposed layout alternatives.

12.6 Aspects for inclusion as conditions in the authorisation

The authorisation is subject to the implementation of the Mitigated Layout Plan which is required to reduce negative impacts to acceptable levels. The authorisation is also subject to the recommendations contained in the EMPr (Part B). Key conditions to be included are the implementation of the mitigated layout plan and the demarcation of site development areas as per approved footprints.

12.7 Description of any assumptions, uncertainties and gaps in knowledge

The outcomes of this EIA Report are based on the following assumptions, uncertainties and knowledge gaps:

- The impacts are associated with the project description provided by the Sishen Iron Ore Company and as described in Section 4.
- The proposed layout of project as provided are conceptual. Detailed design of such infrastructure is still to be undertaken. The final layout may differ slightly from the conceptual layout plan. The principles as specified in the outcomes of the EIA Report will however be adhered to during final design.
- The EIA was done at a specific time frame according to current environmental legislation which may change over time.
- Each specialist study contains specific assumptions and limitations that apply to the outcome of the EIA process.
- The ecological assessments (fauna, flora and water course studies) were conducted during August. A more accurate assessment would require that assessments take place in all seasons of the year, especially during the rainy season when flora and fauna species are more active. However, on-site data was significantly augmented with all available desktop data and specialist experience in the area, and the findings of this assessment are considered to be an accurate reflection of the ecological characteristics of the study area.
- The available budget to implement management and mitigation measures to enhance positive social impacts and mitigate negative environmental impacts, are dependent on economic conditions.

12.8 Reasoned opinion as to whether the proposed activity should or should not be authorised

It is the opinion of the EAP that the activities and infrastructure associated with Kolomela mine be authorised based on the following reasons:

- Impacts of the Kolomela layout has been revised to minimise the impact (especially on water courses) as far as practicable;
- The positive socio-economic impacts of Kolomela Mine as a whole are substantial for the local economy and the proposed changes will mean that the mine will have the potential to continue to provide such benefits to local communities;
- The nature of the impacts do not differ from that which is conducted by Kolomela;
- The magnitude and extent of the impacts on groundwater, air quality and noise receptors does increase, but no significant new areas are expected to be impacted on;
- The identified impacts associated with Kolomela mine as a whole can be effectively managed to acceptable levels, but will require commitment from the applicant.
- Kolomela mine is committed to implement a land management plan and off set programme which will enhance i.e. biodiversity management within the mining right and on other SOIC owned properties;
- Kolomela mine has a good track record in terms of environmental practices and there is high confidence in the successful implementation of mitigation and ongoing liaison with stakeholders and affected parties to ensure that no person will be worse-off as a result of the proposed expanded operations
- Activities and infrastructure described in this report will enable Kolomela to continue to operate and allow SIOC to properly plan for eventual closure, especially in terms of engagement with stakeholders and employees.

12.9 Period for which the environmental authorisation is required

The Kolomela mine Life of Mine (LoM) currently stands in 2034 with the potential for future expansion if further ore bodies ae deemed feasible to mine.

13. DEVIATIONS FROM THE APPROVED SCOPING REPORT AND PLAN OF STUDY

13.1 Deviations from the methodology used in determining the significance of the potential environmental impacts and risks

Not applicable

13.2 Motivation for deviation

Not applicable

14. OTHER INFORMATION REQUIRED BY COMPETENT AUTHORITY

Not applicable

15. OTHER MATTERS REQUIRED IN TERMS OF SCETIONS 24(4)(A) AND (B) ON NEMA

Not applicable

16. UNDERTAKING

I, Trevor Hallatt, the Environmental Assessment Practitioner responsible for compiling this report, undertake that:

- the information provided herein is correct;
- the comments and inputs from stakeholders and I&APs have been correctly recorded;
- information and responses provided to stakeholders and I&APs by the EAP is correct; and
- the level of agreement with I&APs and stakeholders has been correctly recorded and reported.

Report Sign-Off			
Name	**Designation**	**Signature**	**Date**
Trevor Hallatt	EXM Environmental Advisory (Pty) Ltd Senior Environmental Scientist (EAP)		2021/11/15

17. REFERENCES

Airshed Planning Professionals, September 2021. Air Quality Impact Assessment Report for the Proposed Amendments and Expansions at Kolomela Mine. Report No. 20EXM05.

Airshed Planning Professionals, September 2021. Environmental Noise Impact Assessment for the Proposed Amendments and Expansions at Kolomela Mine. Project Number: 21EXM01.

EXM Advisory Services, October 2021. Visual Impact Assessment.

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GVI Aviation Advisory. 2021. Civil Aviation Sensitivity Verification Report For A Proposed 125megawatt Solar Photovoltaic Power Generation Facility At The Kolomela Mine, Postmasburg

Loubser Water Resources Consult (Pty) Ltd. 2021. Kolomela Geochemical Assessment And Waste Classification.

PGS Heritage, October 2021. Amendment of Existing Mining Activities for Kolomela Mine located South-west of Postmasburg, Northern Cape. Heritage Impact Assessment. Project Number: 553HIA.

Scientific Aquatic Services, August 2021. Freshwater Ecological Assessment As Part Of The Environmental Authorisation And Water Use License Application Processes For The Proposed Mining Expansion Activities At The Kolomela Mine, Near Postmasburg, Northern Cape Province.

Scientific Terrestrial Services, July 2021. Biodiversity Assessment As Part Of The Environmental Authorisation Process For The Proposed Kolomela Mine Expansion Near Postmasburg, Northern Cape. Part B: Floral Assessment.

Scientific Terrestrial Services, July 2021. Biodiversity Assessment As Part Of The Environmental Authorisation Process For The Proposed Kolomela Mine Expansion Near Postmasburg, Northern Cape. Part A: Summary.

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Scientific Terrestrial Services, July 2021. Avifaunal Assessment As Part Of The Environmental Impact Assessment Process For Proposed Solar Photovoltaic (Pv) Project Associated With The Kolomela Mine, Near Postmasburg, Northern Cape Province.

Zimpande Research Collaborative, October 2021. Hydropedological Assessment As Part Of The Environmental Authorisation And Water Use License Application Processes For The Proposed

Mining Expansion Activities At The Kolomela Mine, Near Postmasburg, Northern Cape Province. Report number: ZRC 21-0010.

Annexure A

EAP CV

Surname:	Hallatt
Names:	Trevor Winston
Position:	
Nationality:	RSA
Experience:	10 years environmental consultant in mining and industrial sectors
Professional Registration/Affiliations:	South African Council for Natural Scientific Professions (Reg nr: 300123/15).
Qualification:	MA Environmental Management North West University

Trevor Hallatt has more than 10 years of environmental management experience in mining, power generation, industrial and local government sectors. His duties entail the planning and execution of projects related to environmental management, including Environmental Impact Assessments (EIA), Water Use Licence Applications and IWWMPs, ISO 14001: 2004 and legal compliance audits, Financial Provisioning, Compilation of Environmental Management Programmes, Environmental Risk Assessments and Environmental Management Systems. Trevor also has extensive experience in the application of Geographic Information Systems (GIS) in environmental projects. Trevor is a registered Natural Science Professional with the South African Council for Natural Scientific Professions (Reg nr: 300123/15).

KEY AREAS OF EXPERTISE

- Environmental Impact Assessments;
- Water Use Licence Applications;
- Atmospheric Emissions Licence Applications;
- Geographic Information Systems;
- Environmental Audits (Legal and EMS);
- Environmental Control Officer: and
- Public Consultation.

SUMMARY RECENT PROFESSIONAL EXPERIENCE RELATED TO ENVIRONMTNAL IMPACT ASSESSMENT

Client	Designation	Description
Zinoju Coal	EAP and Project Manager	BA and WUL application for the refurbishment of the old Balgray Colliery near Dundee
Vereeniging Refractories	EAP and Project Manager	Vereeniging Refractories Hammanskraal Clay Quarry Waste Management Licence and EMPr amendment Environmental Legal Audits ECO Functions
Izazi Mining Services	EAP and Project Manager	Three Prospecting Right Applications and Basic Impact Assessment Processes
Aquarella Investment	Specialist	Prospecting Right Application and Basic Impact Assessment Process
Sishen Iron Ore Mine	Environmental specialist	Lylyveld Expansion EIA;
Ceramic Industries	EAP	Warehouse Development Basic Impact Assessment. Atmospheric Emissions Licence and full EIA for Phoenix Factory. WUL Applications (Pegasus and Phoenix Factories) Environmental Legal Audits
Barberton Mines	Environmental specialist	IWWMPs review 2019/2020
Evander Gold Mines	Auditor	EMP Performance Assessments
Kolomela Iron Ore Mine	Project Manager EAP	Conflict management with local farmers Biodiversity action plan and monitoring Various external audits Various EIA'/ EMP's for expansion projects Various mining permit applications
Canyon Coal	Environmental specialist	BA for a coal siding development near Bronkhorstspruit EIA Review and PPP for Prospecting Right Applications
Kangra Coal	Environmental specialist	IWWMP for Kusipongo Project
Ceramic Industries	EAP	Warehouse Development Basic Impact Assessment. Atmospheric Emissions Licence and full EIA for Phoenix Factory. WUL Applications (Pegasus and Phoenix Factories) Environmental Legal Audits
ArcelorMittal	EAP and	EIA and Scoping as well as BAR for the decommissioning

Client	Designation	Description
	Environmental specialist	of the Existing Metallurgical Disposal Site and the Construction of a New Class B Disposal Site Galvanising Line Conversion to Combi-Line Basic Impact Assessment. Environmental Legal Audits
Universal Oil Solutions	EAP and Environmental specialist	Waste Management Licence Application Environmental Legal Audits ECO Functions
TerraNova Ceramics	EAP and Environmental specialist	Atmospheric Emissions Licence and full EIA;
Columbus Stainless	Environmental specialist	Basic Assessment for the Storage of Hazardous Substances.
Bumatech	Environmental specialist	Expansion Project Basic Impact Assessment Process. Environmental Legal Audits ECO Functions
AfriSam SA	Environmental specialist	Environmental Legal Audits ECO Functions

RECENT EMPLOYMENT RECORD

2019-current	EXM Advisory Services Senior Environmental Scientist
2015 – 2019	Zantow Environmental Consulting Services Senior Environmental Scientist
2010 – 2014	Centre for Environmental Management (North-West University) Junior Environmental Scientist

Annexure B

Public Participation

Annexure B1

IAP Database

Annexure B2

Proof of Site Notices Placement


EXPANDED AND NEW ACTIVITIES AT KOLOMELA MINE
POSTMASBURG, NORTHERN CAPE


KUMBA IRON ORE
Kolomela Mine

SISHEN IRO[illegible]ORE COMPANY ([illegible]TY) LTD

NUWE EN UITGEBREIDE AKTIVITEITE TER ONDERSTEUNING VAN KOLOMELA MYN

POSTMASBURG, NOORD KAAP

KENNISGEWING VAN DIE OMGEWINGS GOEDKEURINGSPROSESSE

EXM

SISHEN IRON ORE COMPANY (PTY) LTD

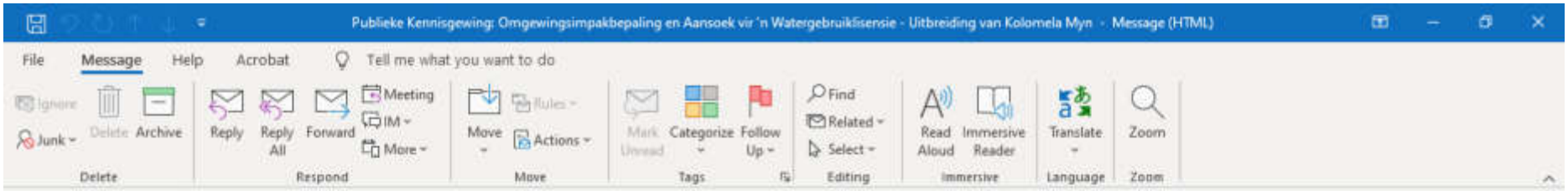
EXPANDED AND NEW ACTIVITIES AT KOLOMELA MINE

POSTMASBURG, NORTHERN CAPE

NOTICE OF THE ENVIRONMENTAL APPROVAL PROCESSES

Annexure B3

Proof of BID Distribution – Emails



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TH

Trevor Hallatt

To

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Wed 2021/05/12 09:42

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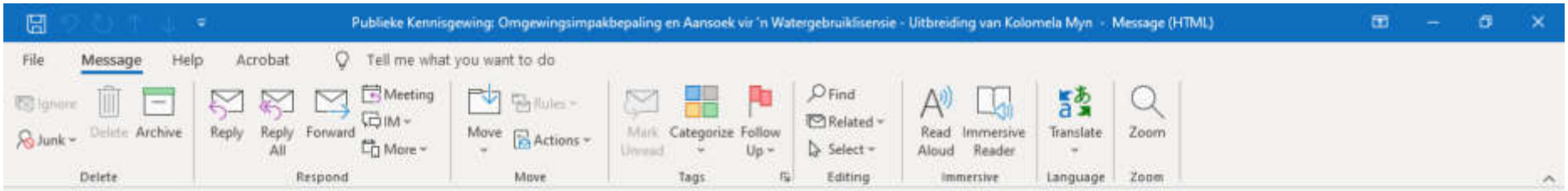
SISHEN IRON ORE COMPANY (PTY) LTD

PROJEK: OMGEWINGSIMPAKBEPALING EN WATERGEBRUIKSAANSOEK TER ONDERSTEUNING VAN DIE UITBREIDING VAN AKTIWITEITE BY KOLOMELA MYN, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd stel voor om nuwe aktiviteite te ontwikkel asook huidige aktiwiteite uit te brei by Kolomela myn wat 8 km suid-oos van Postmasburg geleë is in die Tsantsabane Plaaslike Munisipaliteit, Noordkaap Provinsie. Die voorgestelde aktiviteite sluit onder ander in nuwe ystererts voorraad storing areas, 'n nuwe afval bande stoorarea, veranderde uitleg van Kapstevel oopgroefpit, infrastruktuur vir die bestuur van uitskot (tailings) vanaf huidige prosesse, sonkrag (PV) opwekkingsfasiliteit, addisionele afvalrots stortingsareas, parkeerareas en bogrond stoorareas, verbreding en gewysigde vervoerbande en sleeppaaie, nuwe spoorweglyn, veranderde Kapstevel By Pitfasiliteit etc.

'n Omgewingsimpakstudie (OIB) en omvangsbepaling proses in terme van die regulasies vir die evaluering van omgewingsimpak (GN R326 van 2017) word onderneem om Omgewingsmagtiging (EA) vir die voorgestelde projek te verkry. 'n Aansoekproses vir 'n Watergebruiklisensie (WUL) word ook onderneem vir die voorgestelde projek ingevolge die Nasionale Waterwet (No. 36 van 1998). EXM Environmental Advisory (Pty) Ltd is aangestel as die onafhanklike omgewingsevalueringspraktisyn (EAP) om die OIB en WUL aansoek te fasiliteer, sowel as die ondersteunende openbare konsultasieproses.

Vind asb aangeheg 'n kommentaarblad asook 'n agtergrondinligtingsdokument (BID) wat al die relevante inligting rakende die OIB en WUL aansoekprosesse bevat. **Die konsep Omvangsbepalingsverslag ter ondersteuning van die aansoek sal binnekort aan alle partye beskikbaar gestel word vir kommentaar.**



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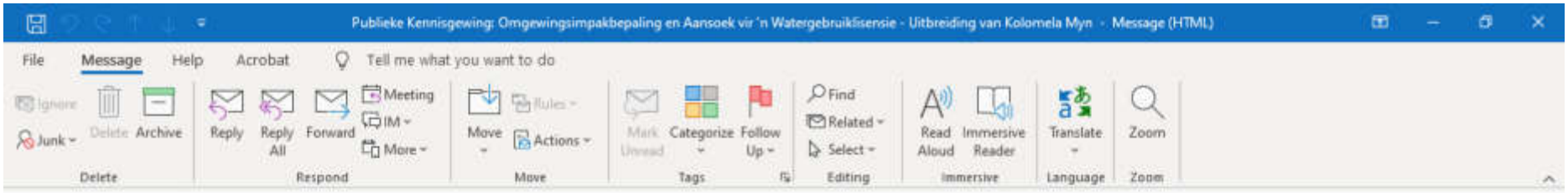

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AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTYE

SISHEN IRON ORE COMPANY (PTY) LTD

PROJEK: OMGEWINGSIMPAKBEPALING EN WATERGEBRUIKSAANSOEK TER ONDERSTEUNING VAN DIE UITBREIDING VAN AKTIWITEITE BY KOLOMELA MYN, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd stel voor om nuwe aktiviteite te ontwikkel asook huidige aktiwiteite uit te brei by Kolomela myn wat 8 km suid-oos van Postmasburg geleë is in die Tsantsabane Plaaslike Munisipaliteit, Noordkaap Provinsie. Die voorgestelde aktiviteite sluit onder ander in nuwe ystererts voorraad storing areas, 'n nuwe afval bande stoorarea, veranderde uitleg van Kapstevel oopgroefpit, infrastruktuur vir die bestuur van uitskot (tailings) vanaf huidige prosesse, sonkrag (PV) opwekkingsfasiliteit, addisionele afvalrots stortingsareas, parkeerareas en bogrond stoorareas, verbreding en gewysigde vervoerbande en sleeppaale, nuwe spoorweglyn, veranderde Kapstevel By Pitfasiliteit etc.

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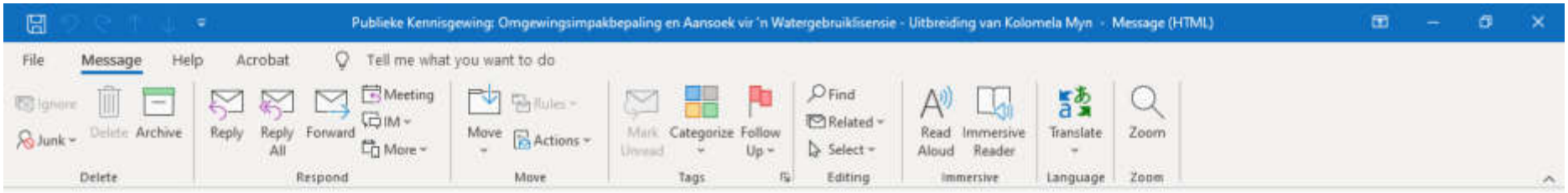

Publieke Kennisgewing: Omgewingsimpakbepaling en Aansoek vir 'n Watergebruiklisensie - Uitbreiding van Kolomela Myn

TH

Trevor Hallatt

To

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Bcc johannes.wessels@yahoo.com ; sdrewinds@mjvn.co.za ; cmcmathe@gmail.com ; hcon1@live.com ; psbsteen@vodamail.co.za ; kobusdirk@gmail.com ; skfloradale@gmail.com ; abac223@gmail.com ; telpoortb@vodamail.co.za ; islaylinde@gmail.com ; samuelwillemse19@gmail.com ; hentie.fourie@4e-i.com ; burger_mar@yahoo.com ; sarel@kpds.co.za ; keanjopty@gmail.com ; sonetw@l2b.co.za ; renevn@me.com ; bj1958@icloud.com ; jannievis@icloud.com ; alidokatz11@gmail.com

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AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTYE

SISHEN IRON ORE COMPANY (PTY) LTD

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Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

TH

Trevor Hallatt

To

Bcc 'wmboaj@saps.org.za' ; 'dirkesau@gmail.com' ; 'nicolas@geckoridge.net' ; 'jacques.meyer@angloamerican.com' ; 'marlenemotlhalane@gmail.com' ; 'thembinikani024@gmail.com' ; 'rietj@saps.org.za' ; 'Msimelelo.Silomntu@assmang.co.za' ; 'swami5353@gmail.com' ; 'hestiamaritz@gmail.com' ; 'gclaassens@ceracast.co.za' ; 'Chrisanneclaassens@gmail.com' ; 'chris.claassens@gmail.com' ; 'haykonstuksie@gmail.com' ; 'wright@polka.co.za' ; 'jemma01@webmail.co.za' ; 'elhpdan@gmail.com' ; 'rudie@possies.co.za' ; 'willie.uys66@gmail.com' ; 'agripostmasburg@gmail.com' ; 'wesselsjcw@gmail.com' ;

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SISHEN IRON ORE COMPANY (PTY) LTD

PROJECT: ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION FOR THE EXPANSION OF ACTIVITIES AT KOLOMELA MINE, POSTMASBURG

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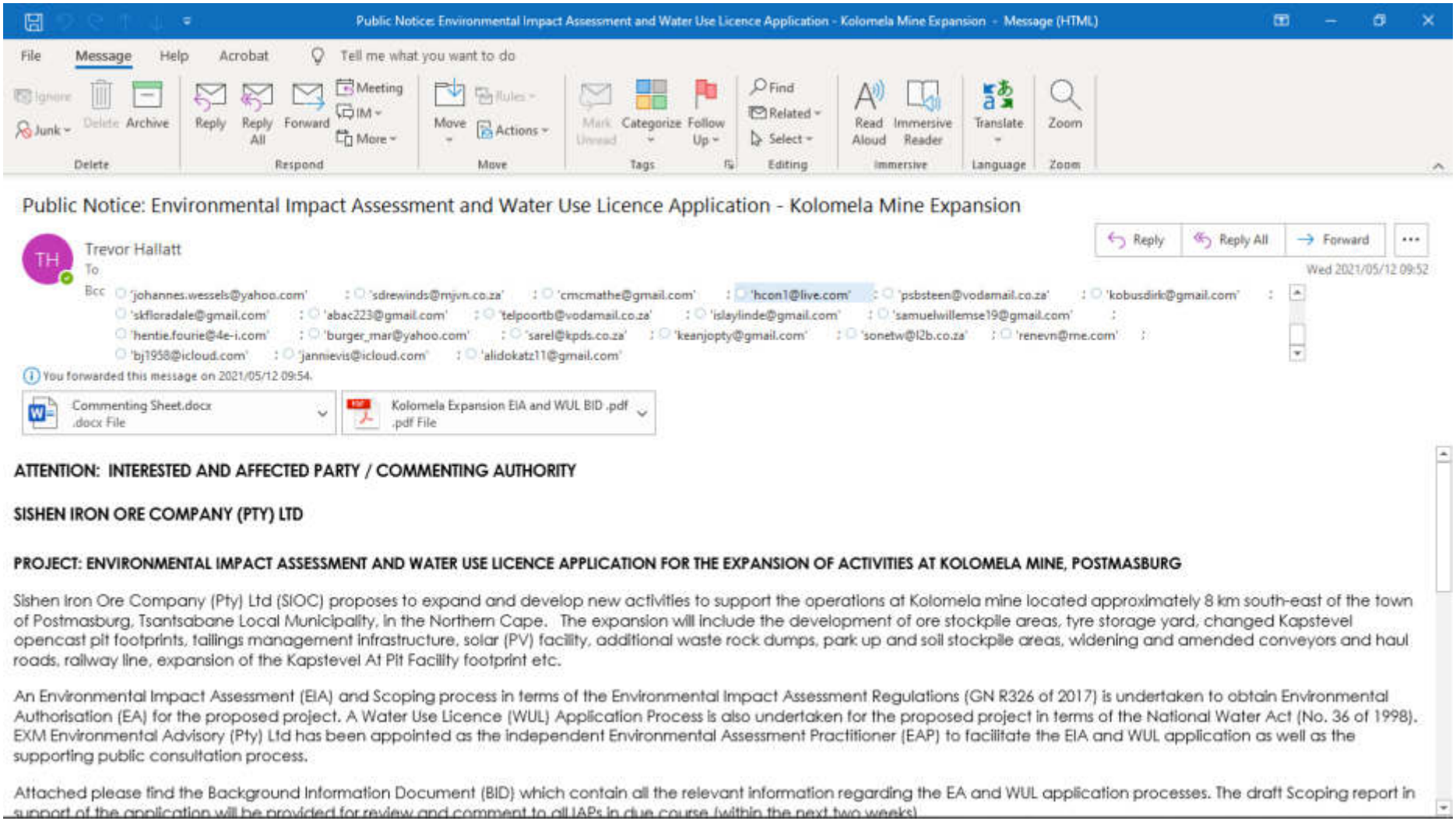

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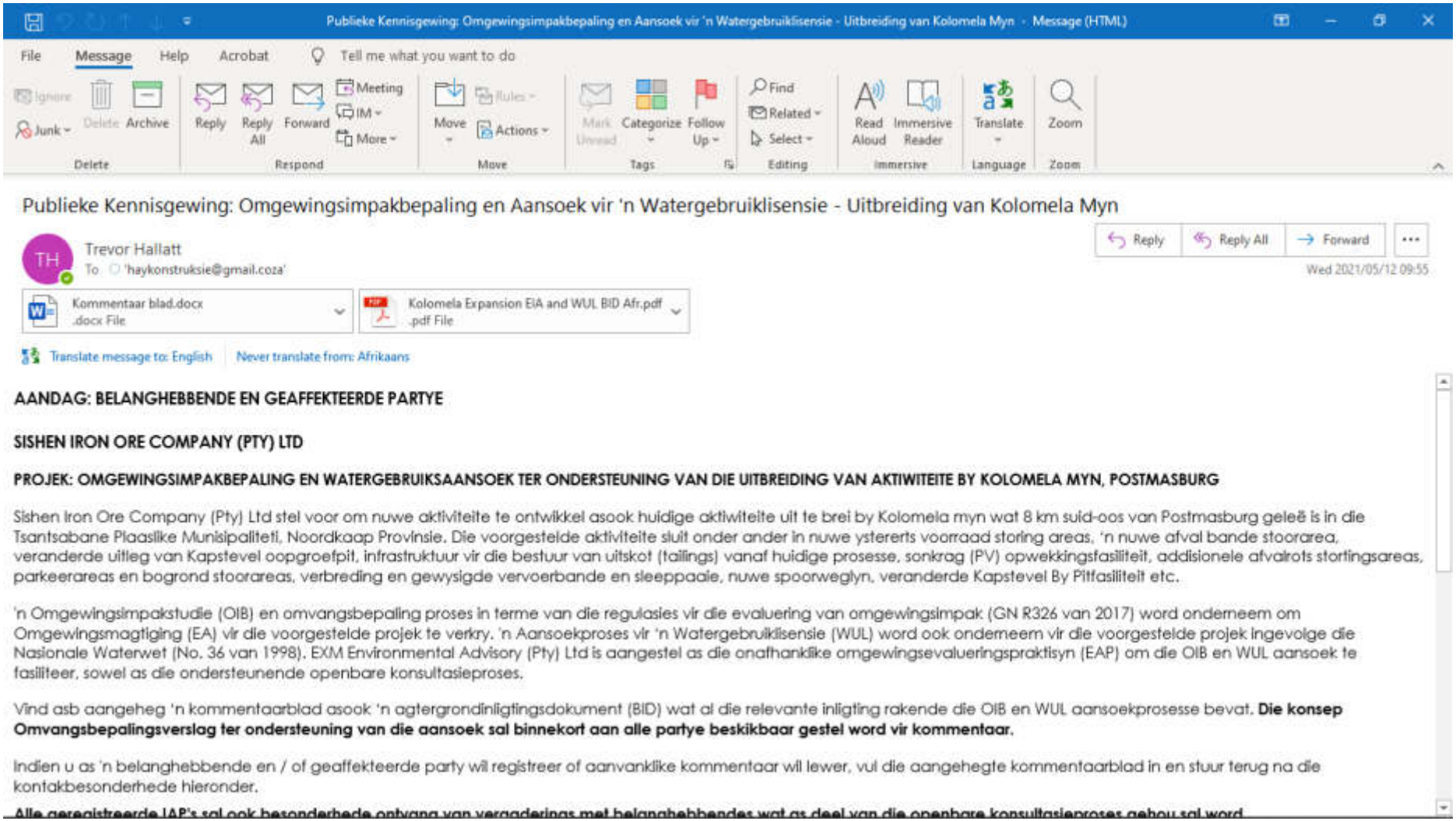
Publieke Kennisgewing: Omgewingsimpakbepaling en Aansoek vir 'n Watergebruiklisensie - Uitbreiding van Kolomela Myn · Message (HTML)
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AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTYE
SISHEN IRON ORE COMPANY (PTY) LTD
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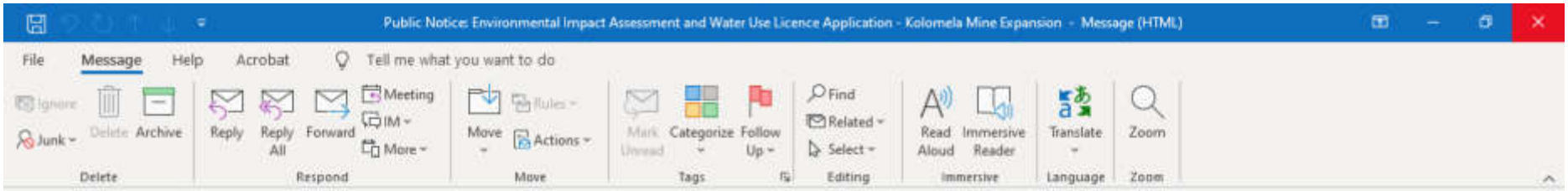
Alle geregistreerde IAP's sal ook besonderhede ontvang van vergaderings met belanghebbendes wat as deel van die openbare konsultasieproses gehou sal word.



Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

TH

Trevor Hallatt

To

Bcc AbrahamsA@dws.gov.za; mokhoantlel@dws.gov.za; hlengania@dws.gov.za; vandykg@dws.gov.za; kgapholam@dws.gov.za; MsimangoP@dws.gov.za; JacolineMa@daff.gov.za; vincent.muila@dmr.gov.za; bfisher@ncpg.gov.za; kgosimoleko@gmail.com; dedat@ncpg.gov.za; drpw-info@ncpg.gov.za; psaayman@ncpg.gov.za; info@sahra.org.za; nhiggitt@sahra.org.za; nkabitin@caa.co.ca; maphangas@caa.co.za; phinwab@caa.co.za; bslenkoe@ncpg.gov.za; mvandenberg@ncpg.gov.za; aphete@ncpg.gov.za; sdelafontaine@gmail.com; elsabe.dtec@gmail.com

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ATTENTION: INTERESTED AND AFFECTED PARTY / COMMENTING AUTHORITY

SISHEN IRON ORE COMPANY (PTY) LTD

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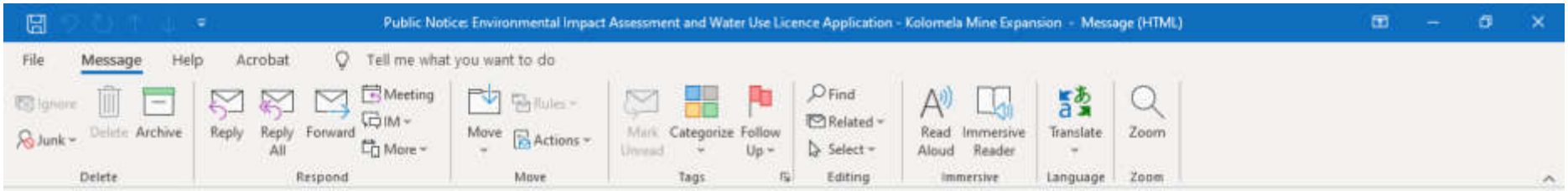

Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

TH

Trevor Hallatt

To

Bcc dircommserv@tsantsabane.gov.za; dirtechnical@tsantsabane.gov.za; hazel.mothibi@lgnet.org.za; julius.theuns@lgnet.org.za; tsantsabane.mm@lgnet.org.za; mm@tsantsabane.gov.za; mmsec@tsantsabane.co.za; admin@zfm-dm.gov.za; admin@zfm-dm.gov.za; premierspa@ncpg.gov.za

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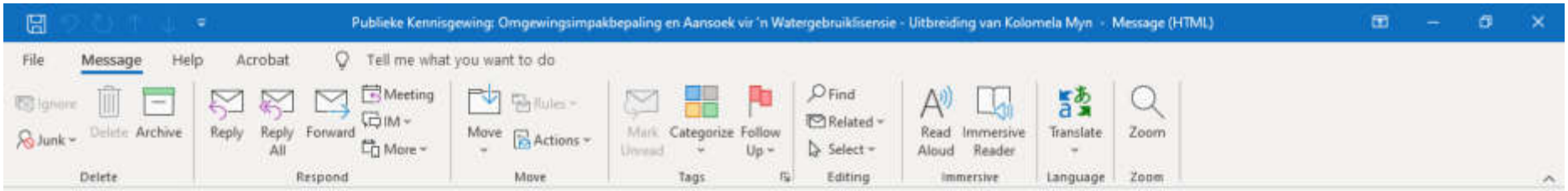

Publieke Kennisgewing: Omgewingsimpakbepaling en Aansoek vir 'n Watergebruiklisensie - Uitbreiding van Kolomela Myn

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Wed 2021/05/12 10:46

TH

Trevor Hallatt

To

Bcc chrystal.vries@assmang.co.za

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AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTYE

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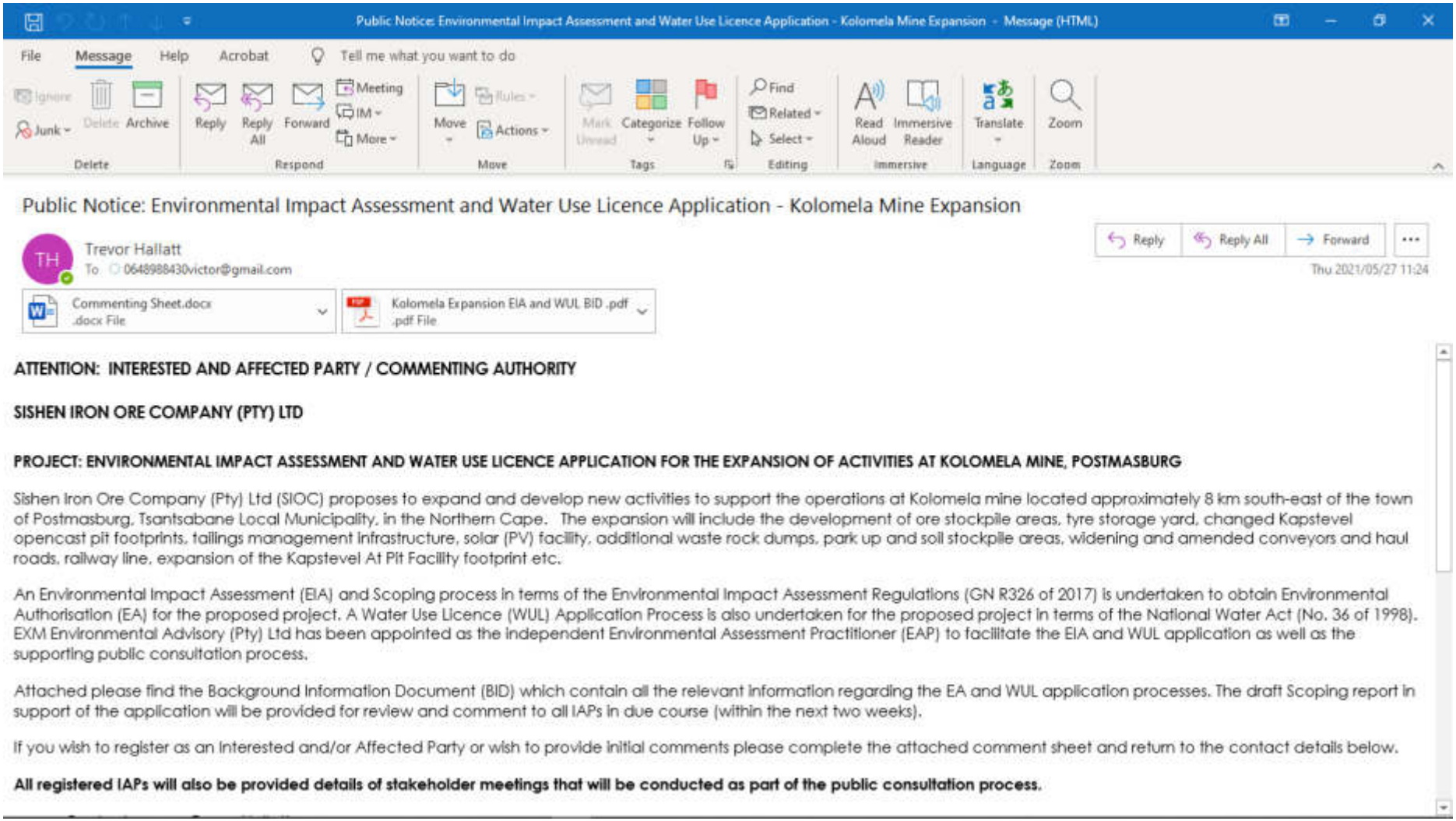
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Junk
Delete
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Reply
Reply All
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More
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Zoom
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Respond
Move
Tags
Editing
Immersive
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All registered IAPs will also be provided details of stakeholder meetings that will be conducted as part of the public consultation process.

Annexure B4

Proof of BID Distribution – SMS

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Annexure B5

Proof of Newspaper Placement

Diary

15 MAY

■ A market takes place at the Kimberley SPCA from 09:00 to 15:00. A variety of products will be sold. Games and music are part of the programme. Interested parties can book a stall for R100 via WhatsApp on 082-309-9056 or 082-309-7885. Half of the stall fees will be donated to the SPCA.

28 EN 29 MEI

■ Die Afrikaanse Protestantse kerk Kimberley bied 'n basaar by Ednastraat 14, Hillcrest, aan. Dit vind Vrydag van 12:00 tot 19:00 en Saterdag van 09:00 tot 14:00 plaas. Stalletjies en 'n teetuin sal beskikbaar wees, en eetgoed sal te koop aangebied word.

29 MEI

■ Die Camelot-musiekfees vind buite Kimberley plaas. Talle kunstenaars sal vermaak verskaf, met die eerste optrede wat om 12:00 begin. Dewald Wasserfall tree om 20:00 op. Skakel 082-802-1444.

Stuur insinywings vir die dagboek na helena.barnard@media24.com

Chef Lizzy Zondag (middle) with two residents of the Northern Cape Mental Health Society, also known as Yonder, at the industrial washing machine donated by the Beefmaster Group. The group has been involved with donations to Yonder for many years. PHOTO: HELENA BARNARD

Trust, teamwork vital

What started as a small cattle-feeding business in 1965 is now Kimberley's largest private employer.

Louw van Reenen

The Beefmaster Group employs over 1 000 people at its Christiana feedlot and processing plant in Kimdustria and has the capacity to process 800 cattle per day. Beefmaster also exports quality beef products to international markets.

In honour of Workers' Day, celebrated on 1 May, Louw van Reenen, chief executive officer of the Beefmaster Group, shares some of his viewpoints on being a leader.

He believes the job of a leader is to inspire others to help create a better future. The best advice he can give, is to create a strong, motivated team. He aims to lead with integrity and honesty.

"If you have the wrong intention when communicating with your people, you are not being truthful.

"I like to give praise where it is due and surprise people who have done well. Sugar-coating feedback doesn't work. If you hand out praise and gifts for good work every week, people stop trusting you."

Incentives work well in motivating a team, but different people have different reasons for doing something. While money would be a great incentive for some, others might prefer a day off.

His leadership motto is to hope for the best, plan for the worst, and motivate everyone to be part of that plan.

"I am a big believer in preparing and always having a contingency plan," he says.

Training at Beefmaster is ongoing. The group has about 70 to 100 learnerships per year.

The biggest mistake he made earlier in his career is believing a job can be done better by putting in more time.

"Sometimes it is about working smarter, not longer," he says.

"It is also a mistake to think you are bigger than the system. It breeds arrogance that will come back to hurt you. It is better to be humble in life and business."

Van Reenen, who is a Christian and gets his inspiration from the Bible, says he is not motivated by personal riches or financial gain.

"I am motivated by how the business helps our people. If I can grow the business, more people will be able to feed their families or send their children to school."

Being constantly involved in the community, Beefmaster plans to assist the Sol Plaatje Municipality with work at its sewerage plant.

SISHEN IRON ORE COMPANY (PTY) LTD
EXPANDED AND NEW ACTIVITIES REQUIRED TO SUPPORT KOLOMELA MINE
POSTMASBURG, NORTHERN CAPE

Notice is hereby given that Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to expand and develop new activities to support Kolomela mine located approximately 8 km south-east of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape. The expansion will include the development of ore stockpile areas, tyre storage yard, changed Kapstevel pit footprints, tailings management infrastrcuture, solar (PV) facility, additional waste rock dumps, park up and soil stockpile areas, wideing and amended conveyors and haul roads, railway line, expansion of the Kapstevel A1 Pit Facility footprint etc.

Environmental authorisation is required in terms of the National Environmental Management Act (Act 107 of 1998) and the National Environmental Management Waste Act (No 59 of 2008) for the following listed activities:

- **Listing Notice 1 of the EIA Regulations (GN R. 327 of 2017) activities 9 -** pipelines **12 –** infrastructure development within water course, **13 –** development of dams (>50m³), **14** – fuel storage (storage of dangerous goods) **24** - construction of a road, **27 -** clearance of vegetation > 1 hectares and **56** – widening of roads.
- **Listing Notice 2 of the EIA Regulations (GN R. 325 of 2014, as amended) activities 1 –** development of solar plant, **6 –** development of Return Water Dam and Evaporation Dams **15 -** clearance of vegetation > 20 ha .
- **Listing Notice 3 of the EIA Regulations (GN R. 324 of 2014, as amended) activities 8 –** development of conveyor across a stream, **12 -** clearance of vegetation in a Critical Biodiversity Area and **14 –** development of infrastructure in a water course.
- **Waste Management Activities** 7, 10, 11 and 13 of Regulation GN. 921 of 29 November 2013, as amended under National Environmental Management: Waste Act for the deposition of waste rock material.

The application will be supported by a **full Environmental Impact Assessment and Scoping process** in terms of the Environmental Impact Assessment Regulations (GNR 326 of 2017). An application will also be submitted in terms of Section 102 of the Minerals and Petroleum Resources Development Act (No. 28 of 2008) for the amendment of the Environmental Management Programme (EMPr).

Application is also being made for an **Integrated Water Use Licence (IWUL)** in terms of the National Water Act (Act No. 36 of 1998) for:

- Section 21 **(c&i)** – impeding or diverting the flow of water in a watercourse & altering the bed, banks or characteristics of a watercourse for developments within or close to wetland pans and watercourses.
- Section 21 **(g)** discharging water containing waste into a water resource and disposing of waste in a manner which may detrimentally impact on a water resource (development of a Return Water Dam and Evaporation Dams at Kapstevel).

You are hereby invited to register as an Interested and or Affected Party (IAP) to receive further information, review reports and to raise environmental issues, concerns and objection to the application. **All registered parties will also be provided details of the stakeholder meeting that will be conducted as part of the public consultation process.** Kindly make written submission to:

Trevor Hallatt EXM Environmental Advisory (Pty) Ltd
Tel: 071 689 2229 ‖ Fax: 086 521 8167 ‖ Post: PO Box 1822 Rivonia, 2128 ‖ Email: trevor@exm.co.za

Vrou skryf vir genesing

Yolanda Eggar met haar twee nuwe boeke, Pebbles en Peanut Butter asook Kaalvoet Kalahari kind.

Yolanda Eggar is 'n half-Engelse nooi wat tussen die mooi groen Drakensberge in Kwa-Zulu-Natal grootgeword het.

Sy het in Newcastle haar skoolloopbaan voltooi en is daarna geseën met twee pragtige seuns. Sy het ernstig begin skryf om te ontvlug van 'n baie onstuimige huwelik, waar sy erg mishandel is. Nadat sy losgebreek het van die mishandelaar, het sy haar siel terug in haar liggaam geskryf. Dit het gesond gemaak. Haar oudste seun het gesê die wêreld moet sy ma se storie hoor. Alhoewel sy skepties was, het sy eers begin blog. Daar het haar uitgewer Yolanda se werk gesien en die res is geskiedenis.

Skryf het haar 'n stem gegee, toe haar stem stilgemaak is. Skryf het haar heelgemaak toe haar lewe stukkend was.

Yolanda het haar voete in die Kalahari kom plant en is nou 'n voltydse skrywer en doen motiveringspraatjies by vroue-retreats.

Pebbels en Peanut Butter is in Engels en Afrikaans geskryf. Soos haar eerste boek Broken Wings.

Pebbles en Peanut Butter is 'n opvolg op haar eerste boek Broken Wings. Dit was deel van die heelwordproses ná sy die moed gekry het om haar huwelik te beëindig. Dit was meer om sin te maak waardeur sy en haar seuns is. Dis om te sê, dit het gebeur, sy het oorleef, en jy kan ook!

Sy is baie trots op Kaalvoet Kalahari kind. Dis haar eerste boek net in Afrikaans, wat vir haar groot vreugde gee. Toe sy in die Kalahari gekom het, was alles so suiwer. Die Afrikaanse taal, die mense, die duine... so aards. Die Kalahari het amper 'n onskuld aan haar. Sy kon nie anders as om oor die Kalahari te skryf nie. Sy skryf oor dinge wat haar "move" en die mense en die aarde hier het haar so "gemove".

Haar idees kom gewoonlik wanneer die son sak. Soms gebeur daar iets wat haar hart ruk, dan skryf sy 'n gedig daaroor. Jy moet na die persoon se hart luister, dis nie wat hulle sê nie, maar wat jy in hul oë lees.

Sy het al geleer sy kan nie haarself dwing om te skryf nie. Sy sal vir dae lank niks hê om te sê nie, dan word sy ewe skielik in die middel van die nag wakker met 'n klomp stories. Dan sal sy gaan sit en skryf, en nie ophou tot sy haarself leeggemaak het nie. Yolanda is 'n naguil, so sy skryf die meeste van haar stories tussen 22:00 en 04:00 in die nag. Sy is nie juis 'n oggendmens nie en konsentreer beter as alles stil is.

Haar raad aan skrywers is: Just do it. “Skryf wat in jou kop is. Los die kap- en pleisterwerk vir laaste. Anders gaan jy nie 'n boek hê nie. Soms skryf ek 'n week lank, net om alles in een aand te verander.”

Sy het begin skryf omdat sy geen ander stem gehad het nie. Sy is erg mishandel in haar vorige huwelik. Aangesien sy nog altyd van stories gehou het, het sy haar gedagtes begin neerpen. Alhoewel dit iets is wat sy weggesteek het, het dit haar 'n sekere mate van vryheid gegee. Sy kon skryf en sê wat sy wil, niemand het haar geoordeel of seergemaak wanneer sy skryf nie. Daarom het sy vry gevoel. Dit laat haar steeds baie vry voel. Sy skryf haar hart leeg, dit gee vir haar baie berusting en laat haar veilig voel.

Die eerste boek wat haar laat huil het, was Daughters of Islam deur Miriam Adeney. Sy lees net biografieë en hou van menslike stories. Die meeste fiksie is vir haar juis dit, fiksie, sy leef haar nie in die verhaal in nie.

Haar skryfwerk is nie vir haar 'n geestelike oefening nie, meer soos 'n deel van haar wat gedoen moet word. “Ek en skryf is een. Ek kan nie my lewe sonder my skryfwerk voorstel nie. Dis deel van my roetine. As ek nie skryf nie, voel ek half.

Soms skryf ek twee ure, ander kere vyf ure. Dit hang af hoeveel ek te sê het. Sommige dae skryf ek min.”

Kathu-skoonheid word 2de prinses

Regs: **Esmé Rautenbach, Fotograaf - Toktokkie Fotografie en die rok is geborg deur Splendor, Kathu.**

Esmé Rautenbach is op Saterdag 24 April 2021, gekroon as 2de prinses van Miss Pre-Teen South Africa.

Esmé het 'n brief aan die Kathu Gazette gestuur oor haar ervaring van hierdie dag: “Hier stap 'n plaaslike meisie in een van die luuksste plekke in om 'n kroon te ontvang.

Dit was 'n belewenis en 'n half. Wat 'n voorreg. Daar is 'n formele funksie gehou, maar volgens Covid-regulasies. Slegs ouers kon dit bywoon, maar om te dink die hele Suid-Afrika sou dit sien. Ek was bevoorreg om raakgesien te word.

'n Modelkompetisie gaan nie net oor 'n mooi gesig nie, maar ook oor jou barmhartigheidsdiens aan minderbevoorregde gemeenskappe.

Ek voel baie spesiaal, en dit was vir my 'n groot voorreg om die geleentheid by te woon. Almal was baie vriendelik en het my baie welkom laat voel.

Dit was definitief harde werk, maar die vrugte daarvan is gepluk. Dit is 'n ondervinding wat ek nooit sal vergeet nie.

Ek moedig almal aan om altyd jou drome na te steef.”

Annexure B6

Copy of BID

SISHEN IRON ORE COMPANY (PTY) LTD

ATTENTION: INTERESTED AND/OR AFFECTED PARTY

NOTICE OF A FULL ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION NEW AND EXPANDED ACTIVITIES AT KOLOMELA MINE NEAR POSTMASBURG, NORTHERN CAPE

1. Introduction

Notice is hereby given that Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to develop new activities and expand some existing activities in support of mining at t Kolomela mine located approximately 8 km south-east of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape.

An application will be submitted for Environmental Authorisation in terms of:

- Section 102 of the Minerals and Petroleum Resources Development Act (No. 28 of 2008) for the amendment of the Environmental Management Programme (EMPr).
- Listing Notices 1 (GN R. 327 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 324 of 2017) of the Environmental Impact assessment (EIA) regulations published in terms of the National Environmental Management Act (No. 107 of 1998).
- Waste Management Activities published under Regulation GN. 921 of 29 November 2013, under National Environmental Management: Waste Act (No. 59 of 2008).

A full Scoping and Environmental Impact Assessment process must be undertaken in terms of the EIA regulations (GNR 326 of 2017) to obtain Environmental Authorisation (EA) for the proposed expansion project. The Northern Cape Department of Mineral Resources and Energy is the Competent Authority (CA) responsible for administration of the process.

An application will also be submitted for the licensing of water use activities in terms of Section 21 (c, g and i) of the the National Water Act (No. 36 of 1998):

A public participation process must be undertaken in terms of the regulatory requirements for both the EIA and water use licensing process. This letter serves to **notify you as a landowner, lawful occupier, interested or affected party of the EIA and WUL application processes that are being undertaken.**

EXM Environmental Advisory (Pty) Ltd ("EXM") has been appointed as the Independent Environmental Assessment Practitioners (EAP) responsible for administrating the abovementioned application process:

PURPOSE:

This document serves to:

- Notify you of the environmental application processes.
- Describe the application processes.
- Inform you as to how you can provide input into the processes.

YOUR ROLE:

As an interested and affected party, your role is to:

- Ask questions, raise issues and concerns.
- Review and provide comment on environmental reports.

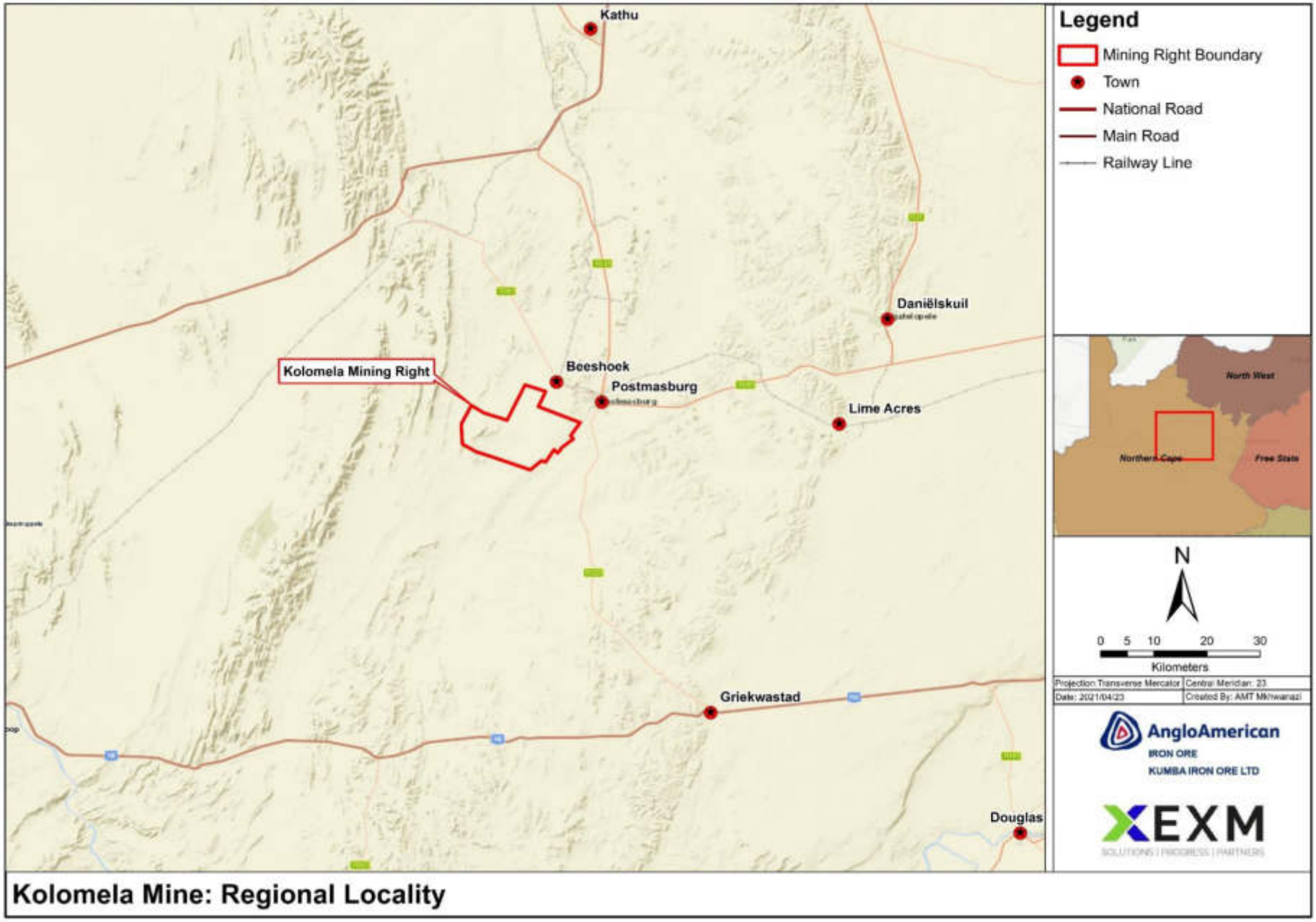

FIGURE 1: GENERAL LOCATION OF KOLOMELA MINE

2. Preliminary Overview of the of the proposed Kolomela expansion activities

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south east of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province.

SIOC proposes to develop new and expand existing activities to facilitate mining at Kolomela mine. The following new and expanded activities are proposed at Kolomela mine:

- A new Photovoltaic Solar Facility to support electricity supply to the mine..
- New Low Grade Ore Storage Areas for the storage of ore transported for processing at Kolomela from surrounding mines.
- New infrastructure for the management of tailings from the existing DMS Plant:
  - New Tailings Storage Facility on the existing Leeuwfontein Waste Rock Dumps.
  - Paddocks for the temporary storage of tailings adjacent to the existing DMS plant.
  - A return water dam for the management of water from the TSF for re-use at the plant.
- A new Waste Tyre Management Facility.
- A new Conveyor and railway line to transfer material to and from the DMS Plant.
- A new Haul Truck Parking area at Kapstevel South Pit.
- Widening and amendment of the Kapstevel Haul roads.
- Amendment to Kapstevel DMS conveyor (to be built in the future) position to allow for expanded haul roads.
- Amendment of Kapstevel Waste Rock Dumps including new facilities to allow for disposal to accommodate changes in mine planning and protection of potential future ore reserves.
- Operational changes to existing disturbed footprints layout.
- Additional soil stockpile and park up areas.
- Stormwater management infrastructure at Kapstevel Waste Rock Dumps and Kapstevel At Pit Facility including evaporation dams and diversion berms.
- Access road to facilitate construction of infrastructure at the Kapstevel At Pit Facility.
- Expansion of waste rock dump footprint areas to allow for reshaping during rehabilitation.

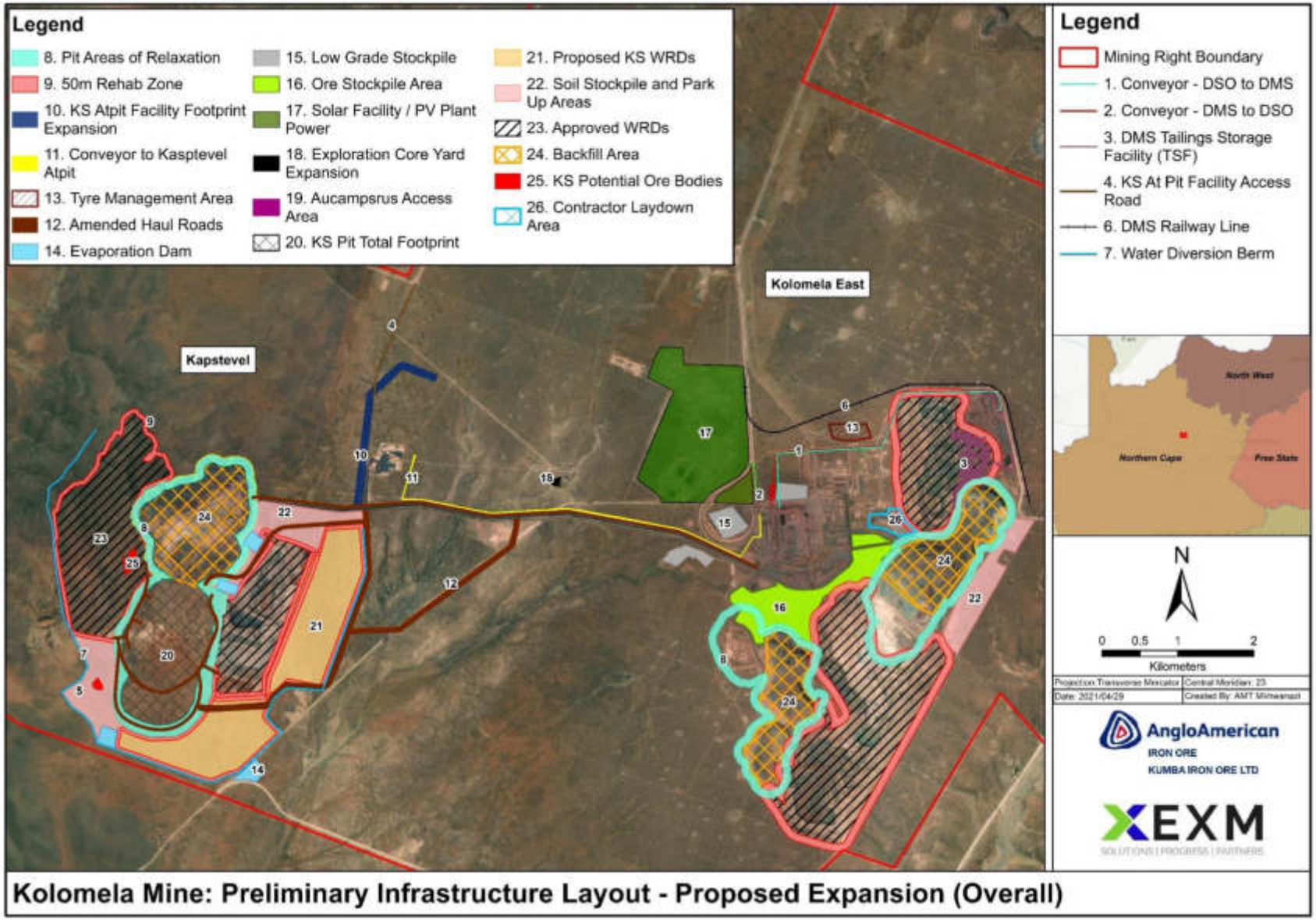

FIGURE 2: INITIAL CONCEPTUAL LAYOUT OF EXPANSION ACTIVITIES

3. Environmental Approvals Required

3.1 Minerals & Petroleum Resources Development Act (No. 28 of 2008)

Section 102 of the Minerals & Petroleum Resources Development Act (MPRDA) regulates the amendment of an EMPr due a change of activities related to a specific mining right. The proposed activities including the expansion of mining and association activities at are not included in the existing approved Kolomela EMPr or any amendment thereto. The EMPr thus requires amendment to include the new and changed infrastructure at Kolomela.

3.2 National Environmental Management Act (No. 107 of 1998) (NEMA)

The expansion of mining related activities at Kolomela mine triggers various activities listed in Listing Notices 1 (GN R. 327 of 2017), 2 (GN R. 325 of 2017) and 3 (GN R. 324 of 2017) published in terms of the National Environmental Management Act.

Activities triggered in terms of Listing notice 2 require an environmental authorisation which needs to be supported by a full EIA and Scoping process that must be conducted in terms of the NEMA EIA regulations (GNR. 982 of 2014, as amended). Activities triggered in terms of Listing notices 1 and 3 require an environmental authorisation which needs to be supported by a Basic Impact Assessment, however a full EIA will be required due to the triggering of activities in listing Notice 3.

According to the EIA Regulations, the competent authority for submission of the application for environmental authorisation is the Minister responsible for mineral resources i.e. the Northern Cape Department of Mineral Resources and Energy (DMRE). The regulated timeframes for the completion of the EIA process, as provided in the EIA Regulations, are provided in Figure 3.

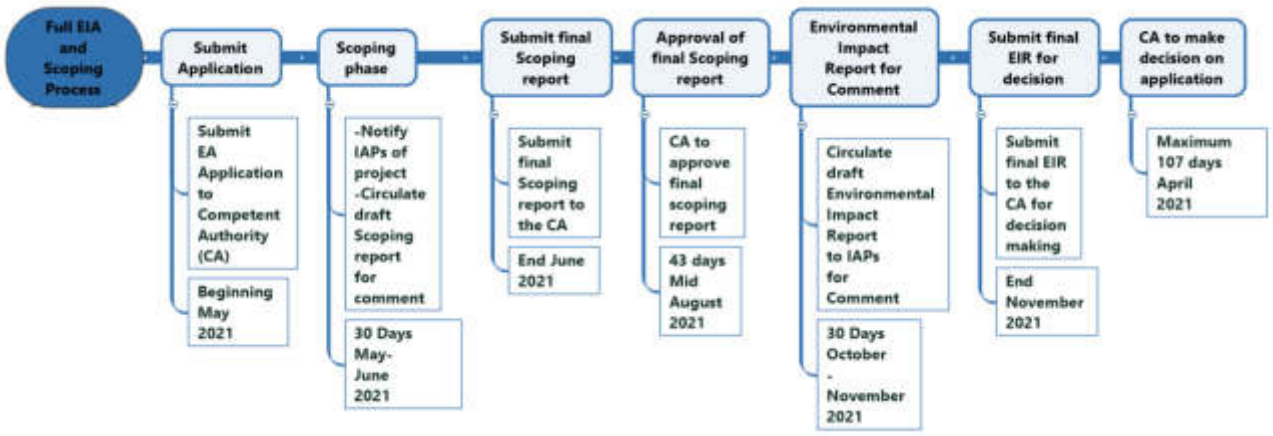

FIGURE 3: EIA Process

Table 1: NEMA Listed Activities triggered by the Project

Applicable Regulation		Project Infrastructure related to Listed Activity
Listing Notice 1 (GN R. 327 of 2017)		
Activity 12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or (ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse	Wetland pans (water courses) are situated in the area in which some infrastructure are to be located and will potentially be impacted by the project footprint. The amended haul roads and Kapstevel DMS conveyor will also cross the "Welgevondenspruit". A WUL application will be submitted to obtain authorisation in terms of activities listed in Section 21 of the National Water Act (No. 36 of 1998).
Activity 13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Development of water management infrastructure, including a Return Water Dam and the Kapstevel Evaporation Dams
Activity 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.	The development of the park up area at the Kapstevel South pit will entail additional diesel storage.
Activity 24	The development of a road— (i) [a road] for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) [a road] 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) [roads] which [are] is identified and included in activity 27 in Listing Notice 2 of 2014; (b) [roads] where the entire road falls within an urban area; or i. (c) which is 1 kilometre or shorter.	Development of the Kapstevel Haul Roads and Kapstevel At Pit Facility Access Road
Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation	Infrastructure with a footprint of more than 1, but less than 20 ha

Applicable Regulation		Project Infrastructure related to Listed Activity
Activity 56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre	Widening of mine haul roads.
Listing Notice 2 (GN R. 325 of 2017)		
Activity 1	The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more	Development of the Solar Photovoltaic Facility
Activity 6	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.	Development of the Kapstevel Evaporation Dams and Return Water Dam triggers activity g listed in terms of Section 21 of the National Water Act and will therefore require a Water Use Licence.
Activity 15	Activity 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.	Development of infrastructure with a footprint of more than 20 ha.
Listing Notice 3 (GN R. 324 of 2017)		
Activity 8	The development and related operation of above ground cableways and funiculars. g. Northern Cape i. All areas outside urban areas	Development of DMS and DSO conveyor
Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation g. Northern Cape ii. Within critical biodiversity areas identified in bioregional plans;	Development of infrastructure, including Kapstevel Haul Roads, Waste Rock Dumps, Solar Facility, Amended Kapstevel DMS Conveyor
Activity 14	The development of— (i) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse,	Amended of Kapstevel Haul Roads

3.3 National Environmental Management: Waste Act (No. 59 of 2008)

In terms of Section 19 of the National Environmental Management: Waste Act, a list of waste management activities that is likely have a detrimental effect on the environment was promulgated through Regulation GN. 921 (November 2013). The listed activities were amended by GN. 633 of 24 July 2015 to include the development of mine residue dumps. Note that in terms of Schedule 3 of the Act, all mineral residue deposits are also regarded as Hazardous Waste.

An application needs to be made to the DMRE for a Waste Management Licence to allow for the development or expansion of waste rock dumps and the development of a Tailings Storage Facility. The application is to be supported by a Scoping and EIA Process, Category B activities are triggered.

Table 2: Waste Management Activities

Activity No	Description
Category B	
2	Reuse of tailings discard and waste rock material
7	The disposal of any quantity of hazardous waste to land i.e. mineral residue (waste rock and tailings) at Kolomela
10	Construction of a waste management activity listed in Category B of this Schedule.
11	The establishment of a residue deposit resulting from mining activities at Kolomela.
13	The expansion of a residue deposit resulting from mining activities at Lylyveld

3.4 National Water Act (No. 36 of 1998) (NWA)

The proposed expansion activities will include water uses as defined in terms of Section 21 of the National Water Act (Act 36 of 1998). These proposed water uses are provided in Table 2 below.

Table 3: Section 21 water uses to be included in the Water Use Licence Application

Section 21 Listed Activity	Related activities
c&i (water courses – pans and stream)	Construction/amendment of infrastructure • Haul roads (widening and new) • Conveyors to and from DMS plant. • Railway from DMS plant. • Kapstevel Waste Rock Dump • Waste Tyre Storage Area
g (waste disposal)	Construction/amendment of infrastructure • Kapstevel Evaporation Dams • Kapstevel Waste Rock Dumps • TSF on Leeuwfontein WRD • Paddock facility • Return Water Dam for TSF

Authorisation of the abovementioned water uses will require an application for an Integrated Water Use Licence (IWUL) in terms of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR. 267 of 2017).

The IWUL application will be supported by a Technical Report compiled in accordance with the

requirements of the relevant Annexures of the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR. 267 of 2017). The regulated timeframes for an Integrated Water Use Licence Application process in terms of GN R. 267 of 2017 are provided in Figure 4.

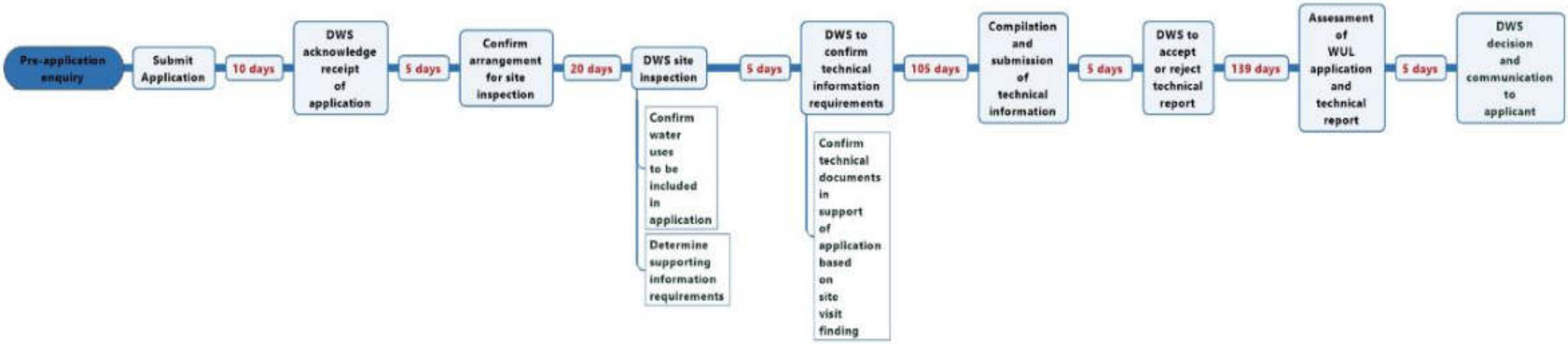

FIGURE 4: INTEGRATED WATER USE LICENCE APPLICATION PROCESS

4. Public Participation Process

A public participation process is being undertaken as part of the applications. The process is conducted in terms of the NEMA EIA regulations (GNR. 326 of 2017) and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals (GNR 267 of 2017) promulgated under the National Water Act, 1998 (Act No.36 of 1998). Stakeholders are offered the opportunity to be informed about the application, raise comments, issues or concerns and provide input into the application and reports.

Interested & affected parties (I&APs) are invited to participate in the environmental process. You can provide input by:

- Registering as an interested & affected party (IAP);
- Asking questions and raising initial concerns by completing and returning the response sheet (attached);
- Reviewing and providing comment on reports.

I&APs will be informed when all the documents will be available for review.

Should you have questions or require more information, **please contact**:

Trevor Hallatt
EXM Environmental Advisory (Pty) Ltd
Cell: 071 689 2229 Office: 010 007 3617
Fax: 086 521 8167
Email: trevor@exm.co.za
PO Box 1822, Rivonia, 2128

Yours sincerely

Trevor Hallatt
Environmental Assessment Practitioner
EXM Environmental Advisory (Pty) Ltd

SISHEN IRON ORE COMPANY (PTY) LTD ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION: EXPANSION OF ACTIVITIES AT KOLOMELA MINE	
Name:	
Address:	
Telephone/cell phone:	
Fax:	
E-mail:	
Date:	
Signature:	

If you know of others who should be informed of this application, please provide us with their contact details:

Name:	
Address:	
Telephone/cell phone:	
Fax:	
E-mail:	

ISSUES, CONCERNS AND QUESTIONS

Annexure B7

Distribution of Scoping Report – SMS and Emails

Phonenumber	Network	Status	ScheduledDate	SubmittedDate	SentData
27637268365	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:40 PM	
27832948386	MTN	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27714850763	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:40 PM	
27718654535	MTN	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
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27822695611	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27823123920	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:40 PM	
27823714717	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:40 PM	
27824195494	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27826284435	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27828557363	Vodacom	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27832295145	MTN	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27832353280	MTN	SUBMITD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27832887067	MTN	DELIVRD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27832922540	MTN	DELIVRD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
27648988430	Vodacom	DELIVRD	6/22/2021 5:48:35 PM	6/22/2021 5:48:39 PM	
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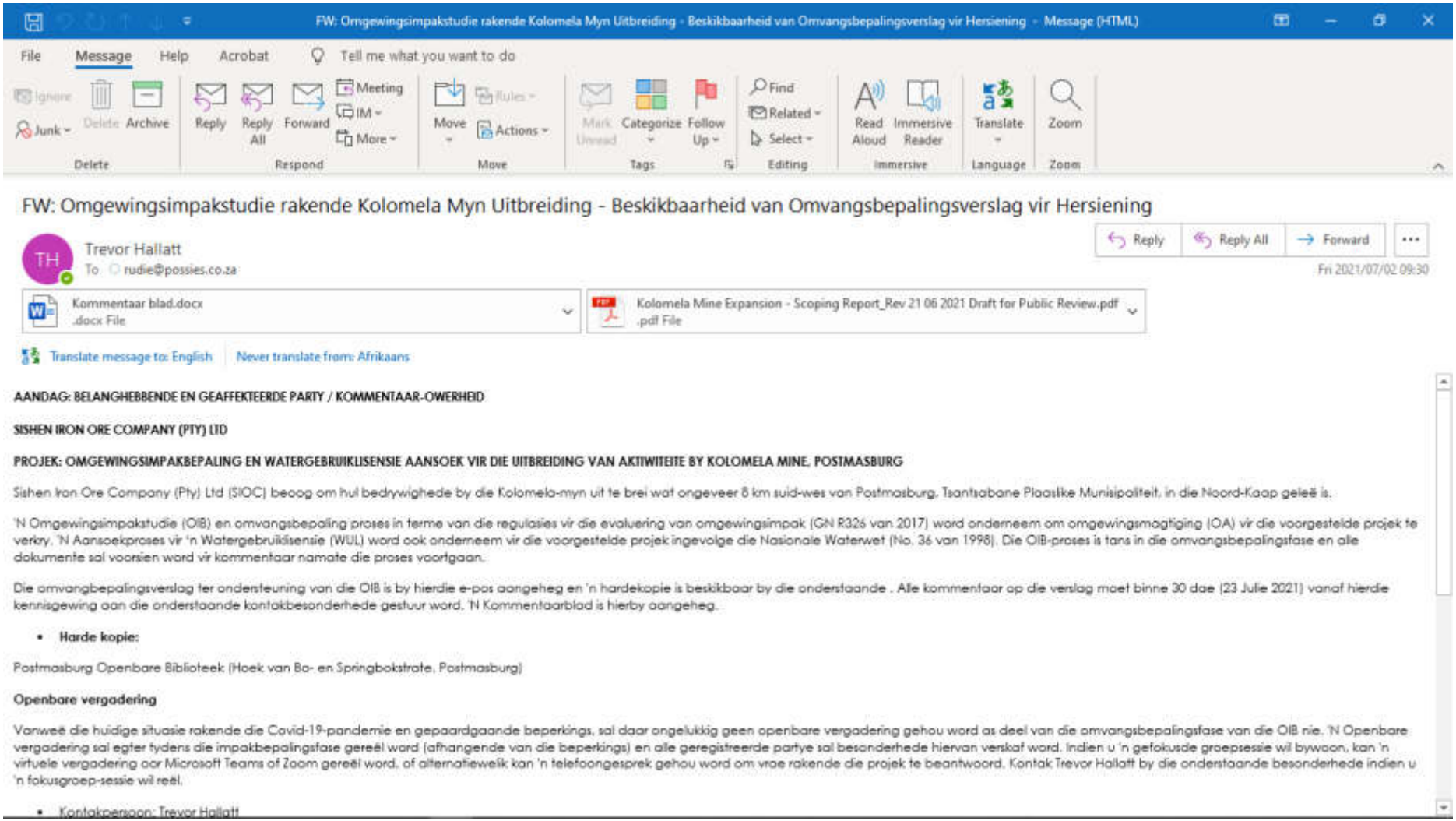
Openbare kennisgewing: Die omvangsbepalingverslag ter ondersteuning van die Omgewingsimpakbepaling vir die uitbreiding van Kolomela myn naby Postmasburg is beskikbaar vir hersiening vir 'n tydperk van 30 dae vanaf hierdie kennisgewing. Kontak Trevor Hallatt by 071 689 2229 (081 507 9947 voor 30 June) of trevor@exm.co.za vir 'n afskrif van die verslag.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Tell me what you want to do
Ignore
Junk
Delete
Archive
Reply
Reply All
Forward
Meeting
IM
More
Move
Rules
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Mark Unread
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Follow Up
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Select
Read Aloud
Immersive Reader
Translate
Zoom
Delete
Respond
Move
Tags
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Immersive
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FW: Omgewingsimpakstudie rakende Kolomela Myn Uitbreiding - Beskikbaarheid van Omvangsbepalingsverslag vir Hersiening
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Trevor Hallatt
To rudie@possies.co.za
Reply
Reply All
Forward
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Kolomela Mine Expansion - Scoping Report_Rev 21 06 2021 Draft for Public Review.pdf
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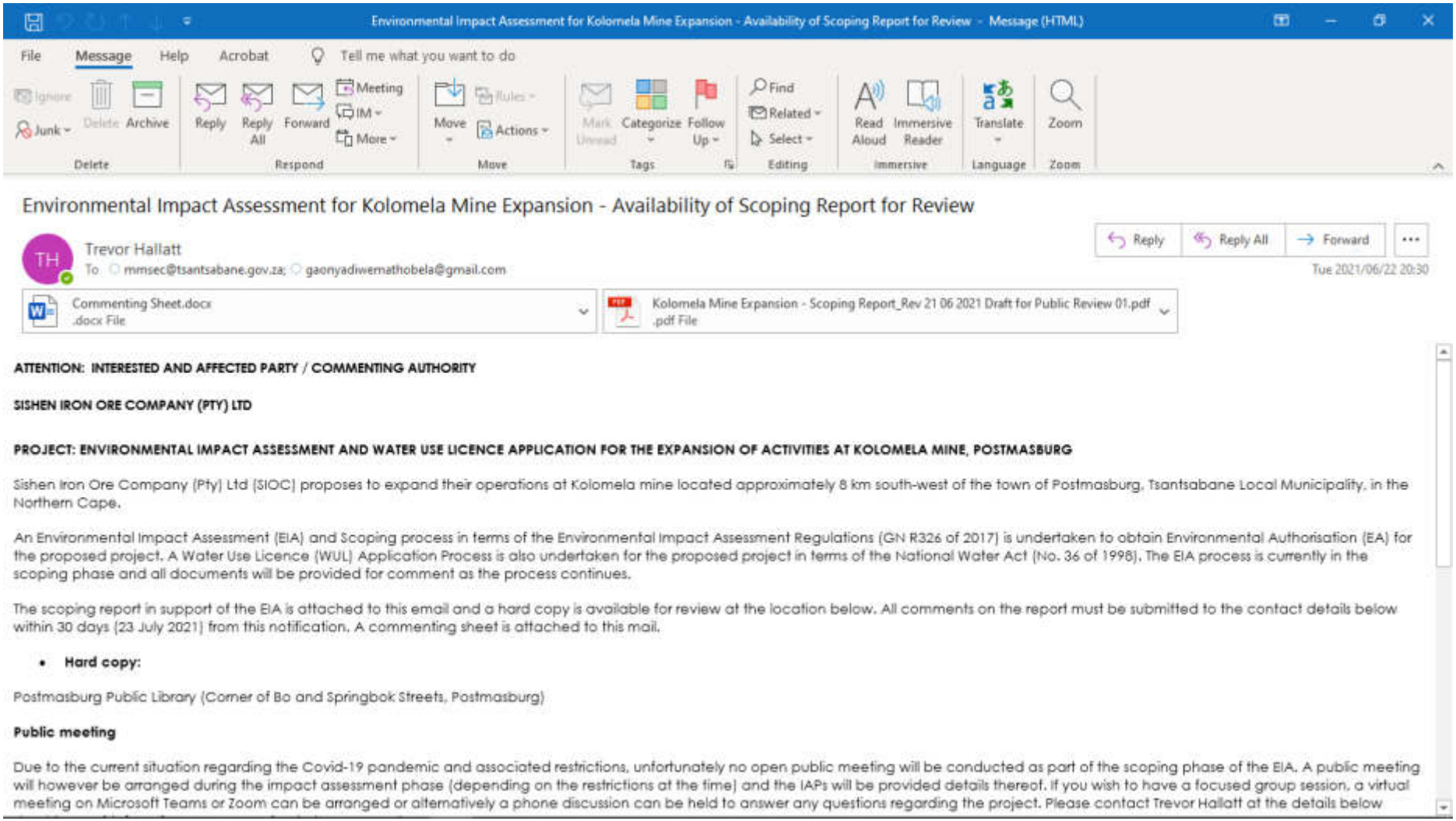
AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTY / KOMMENTAAR-OWERHEID
SISHEN IRON ORE COMPANY (PTY) LTD
PROJEK: OMGEWINGSIMPAKBEPALING EN WATERGEBRUIKLISENSIE AANSOEK VIR DIE UITBREIDING VAN AKTIWITEITE BY KOLOMELA MINE, POSTMASBURG
Sishen Iron Ore Company (Pty) Ltd (SIOC) beoog om hul bedrywighede by die Kolomela-myn uit te brei wat ongeveer 8 km suid-wes van Postmasburg, Tsantsabane Plaaslike Munisipaliteit, in die Noord-Kaap geleë is.
'N Omgewingsimpakstudie (OIB) en omvangsbepaling proses in terme van die regulasies vir die evaluering van omgewingsimpak (GN R326 van 2017) word onderneem om omgewingsmagtiging (OA) vir die voorgestelde projek te verkry. 'N Aansoekproses vir 'n Watergebruiklisensie (WUL) word ook onderneem vir die voorgestelde projek ingevolge die Nasionale Waterwet (No. 36 van 1998). Die OIB-proses is tans in die omvangsbepalingsfase en alle dokumente sal voorsien word vir kommentaar namate die proses voortgaan.
Die omvangbepalingsverslag ter ondersteuning van die OIB is by hierdie e-pos aangeheg en 'n hardekopie is beskikbaar by die onderstaande . Alle kommentaar op die verslag moet binne 30 dae (23 Julie 2021) vanaf hierdie kennisgewing aan die onderstaande kontakbesonderhede gestuur word. 'N Kommentaarblad is hierby aangeheg.
• Harde kopie:
Postmasburg Openbare Biblioteek (Hoek van Bo- en Springbokstrate, Postmasburg)
Openbare vergadering
Vanweë die huidige situasie rakende die Covid-19-pandemie en gepaardgaande beperkings, sal daar ongelukkig geen openbare vergadering gehou word as deel van die omvangsbepalingsfase van die OIB nie. 'N Openbare vergadering sal egter tydens die impakbepalingsfase gereël word (afhangende van die beperkings) en alle geregistreerde partye sal besonderhede hiervan verskaf word. Indien u 'n gefokusde groepsessie wil bywoon, kan 'n virtuele vergadering oor Microsoft Teams of Zoom gereël word, of alternatiewelik kan 'n telefoongesprek gehou word om vrae rakende die projek te beantwoord. Kontak Trevor Hallatt by die onderstaande besonderhede indien u 'n fokusgroep-sessie wil reël.
• Kontakpersoon: Trevor Hallatt


Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review - Message (HTML)
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Acrobat
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Ignore
Junk
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Reply
Reply All
Forward
Meeting
IM
More
Move
Rules
Actions
Mark Unread
Categorize
Follow Up
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Immersive Reader
Translate
Zoom
Delete
Respond
Move
Tags
Editing
Immersive
Language
Zoom
Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review
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Trevor Hallatt
To mmsec@tsantsabane.gov.za; gaonyadiwemathobela@gmail.com
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Reply All
Forward
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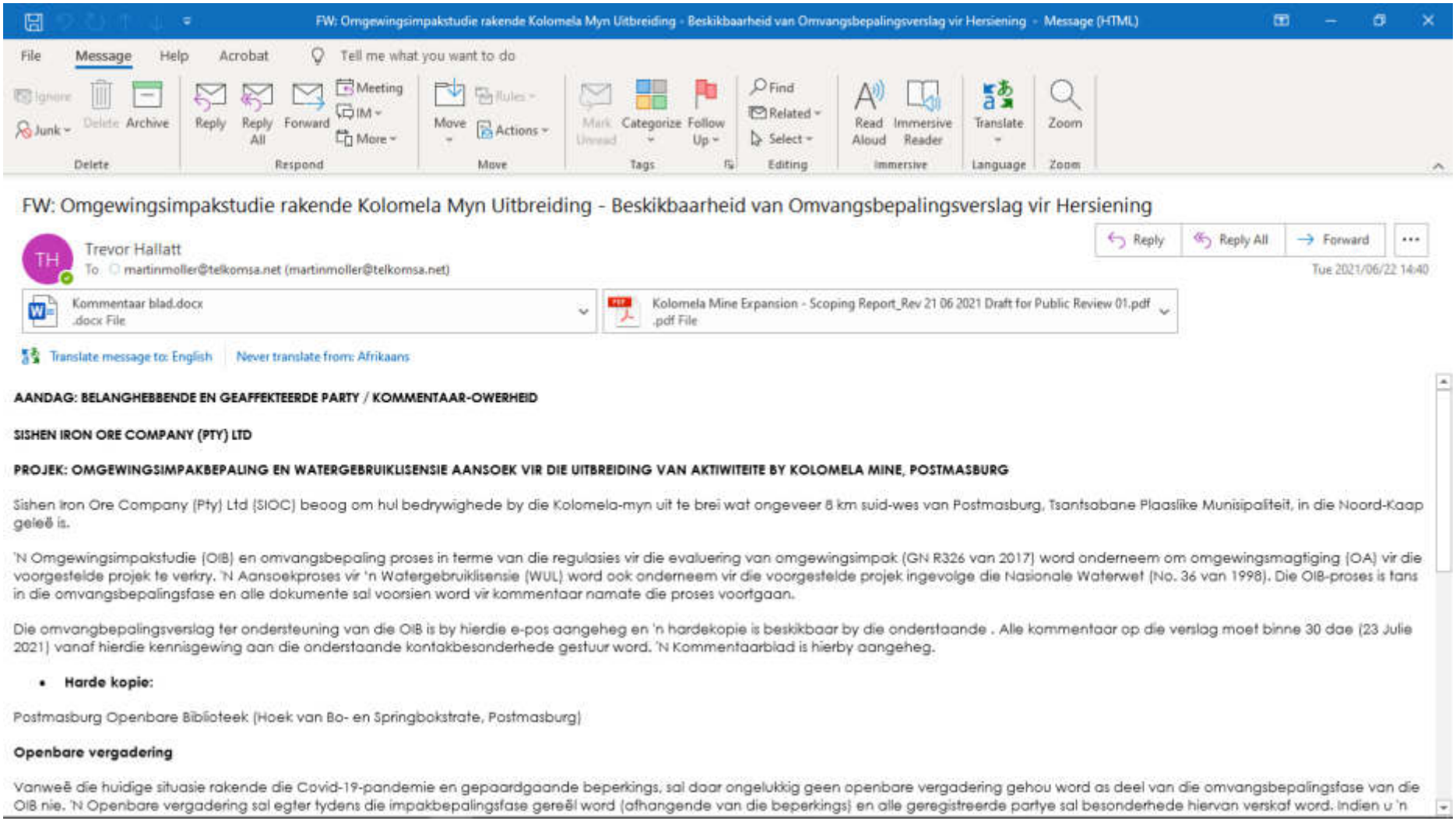
ATTENTION: INTERESTED AND AFFECTED PARTY / COMMENTING AUTHORITY
SISHEN IRON ORE COMPANY (PTY) LTD
PROJECT: ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION FOR THE EXPANSION OF ACTIVITIES AT KOLOMELA MINE, POSTMASBURG
Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to expand their operations at Kolomela mine located approximately 8 km south-west of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape.
An Environmental Impact Assessment (EIA) and Scoping process in terms of the Environmental Impact Assessment Regulations (GN R326 of 2017) is undertaken to obtain Environmental Authorisation (EA) for the proposed project. A Water Use Licence (WUL) Application Process is also undertaken for the proposed project in terms of the National Water Act (No. 36 of 1998). The EIA process is currently in the scoping phase and all documents will be provided for comment as the process continues.
The scoping report in support of the EIA is attached to this email and a hard copy is available for review at the location below. All comments on the report must be submitted to the contact details below within 30 days (23 July 2021) from this notification. A commenting sheet is attached to this mail.
Hard copy:
Postmasburg Public Library (Corner of Bo and Springbok Streets, Postmasburg)
Public meeting
Due to the current situation regarding the Covid-19 pandemic and associated restrictions, unfortunately no open public meeting will be conducted as part of the scoping phase of the EIA. A public meeting will however be arranged during the impact assessment phase (depending on the restrictions at the time) and the IAPs will be provided details thereof. If you wish to have a focused group session, a virtual meeting on Microsoft Teams or Zoom can be arranged or alternatively a phone discussion can be held to answer any questions regarding the project. Please contact Trevor Hallatt at the details below



AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTY / KOMMENTAAR-OWERHEID

SISHEN IRON ORE COMPANY (PTY) LTD

PROJEK: OMGEWINGSIMPAKBEPALING EN WATERGEBRUIKLISENSIE AANSOEK VIR DIE UITBREIDING VAN AKTIWITEITE BY KOLOMELA MINE, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd (SIOC) beoog om hul bedrywighede by die Kolomela-myn uit te brei wat ongeveer 8 km suid-wes van Postmasburg, Tsantsabane Plaaslike Munisipaliteit, in die Noord-Kaap geleë is.

'N Omgewingsimpakstudie (OIB) en omvangsbepaling proses in terme van die regulasies vir die evaluering van omgewingsimpak (GN R326 van 2017) word onderneem om omgewingsmagtiging (OA) vir die voorgestelde projek te verkry. 'N Aansoekproses vir 'n Watergebruiklisensie (WUL) word ook onderneem vir die voorgestelde projek ingevolge die Nasionale Waterwet (No. 36 van 1998). Die OIB-proses is tans in die omvangsbepalingsfase en alle dokumente sal voorsien word vir kommentaar namate die proses voortgaan.

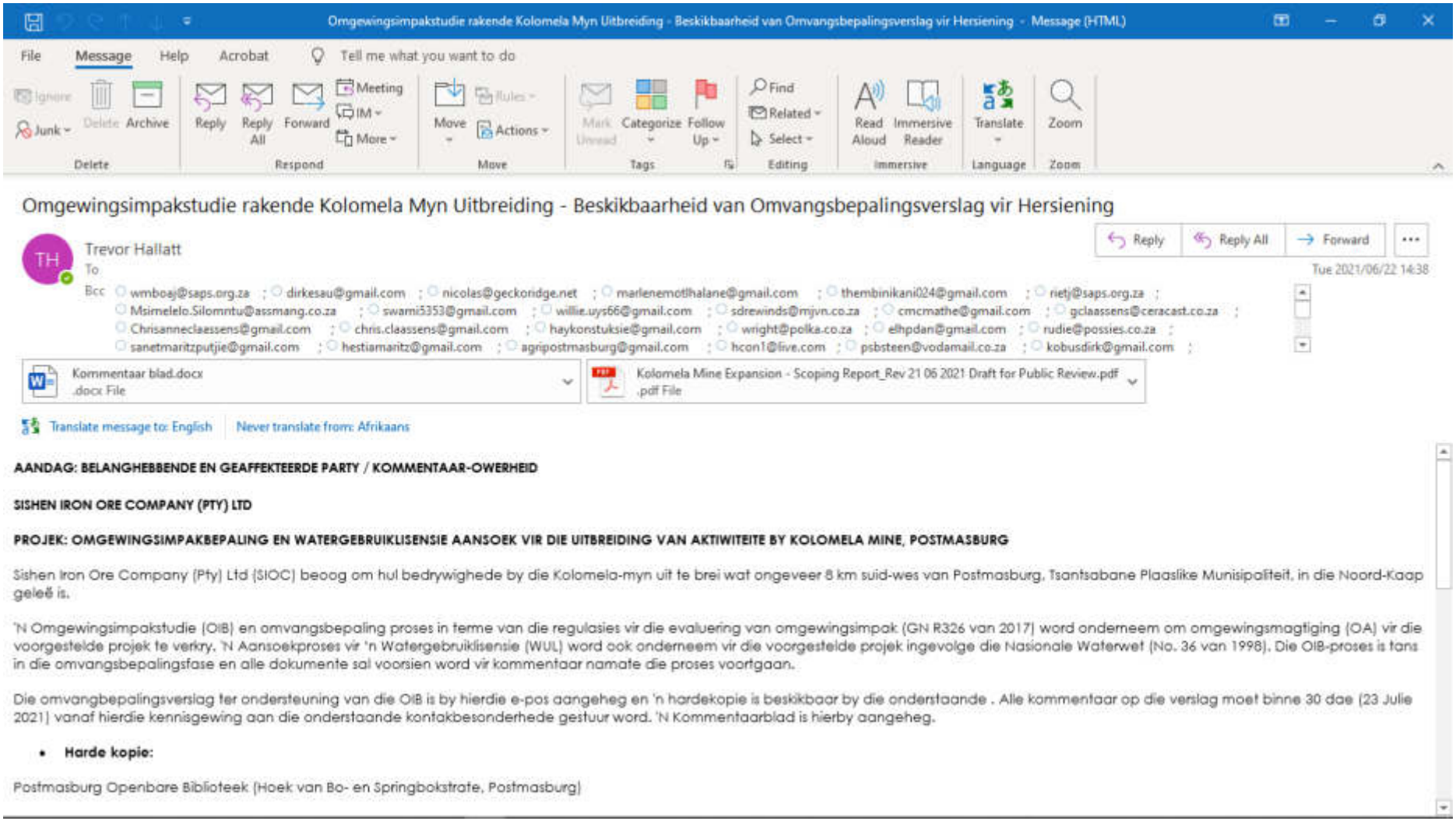
Die omvangbepalingsverslag ter ondersteuning van die OIB is by hierdie e-pos aangeheg en 'n hardekopie is beskikbaar by die onderstaande . Alle kommentaar op die verslag moet binne 30 dae (23 Julie 2021) vanaf hierdie kennisgewing aan die onderstaande kontakbesonderhede gestuur word. 'N Kommentaarblad is hierby aangeheg.

- **Harde kopie:**

Postmasburg Openbare Biblioteek (Hoek van Bo- en Springbokstrate, Postmasburg)

Openbare vergadering

Vanweë die huidige situasie rakende die Covid-19-pandemie en gepaardgaande beperkings, sal daar ongelukkig geen openbare vergadering gehou word as deel van die omvangsbepalingsfase van die OIB nie. 'N Openbare vergadering sal egter tydens die impakbepalingsfase gereël word (afhangende van die beperkings) en alle geregistreerde partye sal besonderhede hiervan verskaf word. Indien u 'n



AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTY / KOMMENTAAR-OWERHEID

SISHEN IRON ORE COMPANY (PTY) LTD

PROJEK: OMGEWINGSIMPAKBEPALING EN WATERGEBRUIKLISENSIE AANSOEK VIR DIE UITBREIDING VAN AKTIWITEITE BY KOLOMELA MINE, POSTMASBURG

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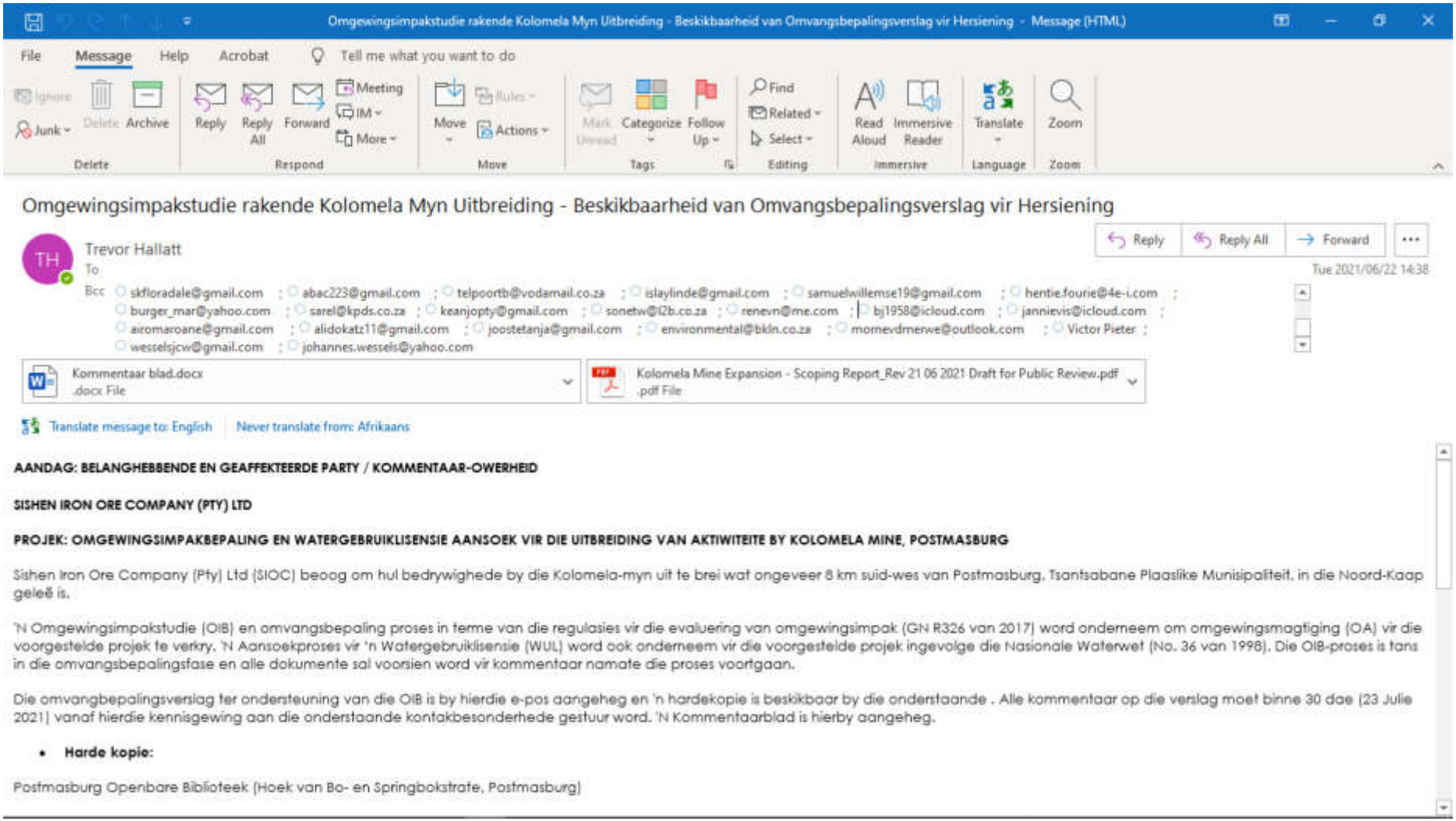

AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTY / KOMMENTAAR-OWERHEID

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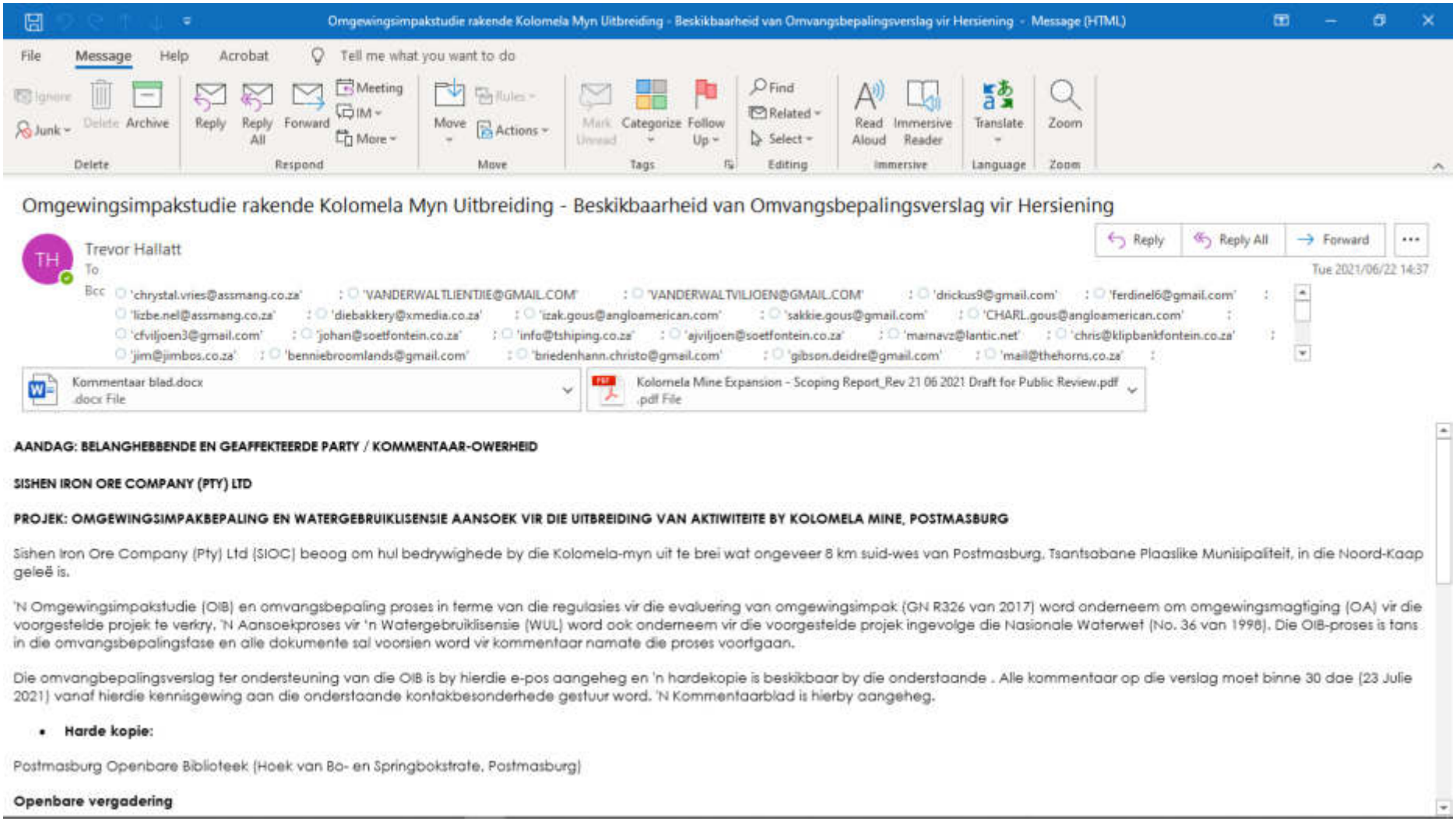

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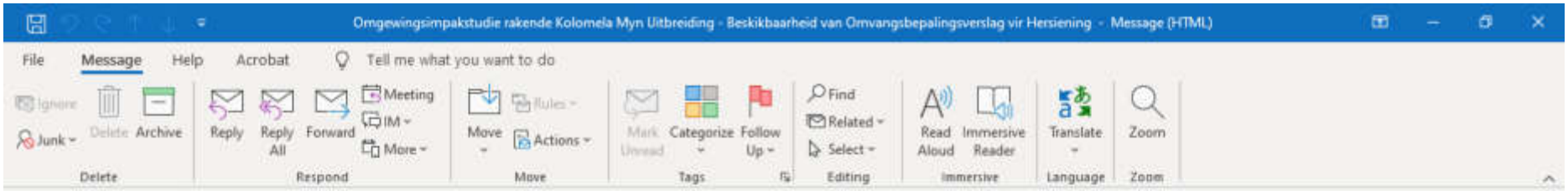

Omgewingsimpakstudie rakende Kolomela Myn Uitbreiding - Beskikbaarheid van Omvangsbepalingsverslag vir Hersiening

TH

Trevor Hallatt

To

Reply | Reply All | Forward | ...

Tue 2021/06/22 14:37

Bcc 'karstenjaco@gmail.com' ; 'Johan.kotze@floradaleboerdery.co.za' ; 'kalahariplanman@gmail.com' ; 'eksteenk@gmail.com' ; 'wynielubbe@gmail.com' ; 'martinmoller@telkomsa.net' ; 'janman@mjvn.co.za' ; 'tjaartpmg@lantic.net' ; 'tjsnijman@gmail.com' ; 'snymanht@gmail.com' ; 'mooidraai@lantic.net' ; 'christa@bospoort.co.za' ; 'johan@bospoort.co.za' ; 'marnavz@lantic.net' ; 'maritza.mvw@gmail.com' ; 'altus.aj@gmail.com' ; 'adam9wahl@gmail.com' ; 'samuelw73@ovi.com' ; 'mornevdmerwe@outlook.com'

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AANDAG: BELANGHEBBENDE EN GEAFFEKTEERDE PARTY / KOMMENTAAR-OWERHEID

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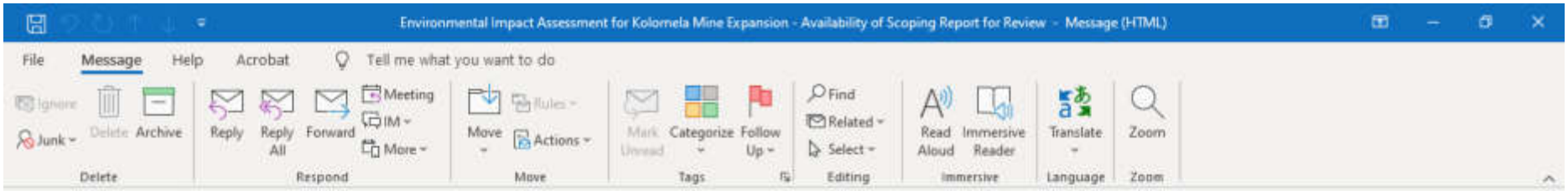

Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

TH

Trevor Hallatt

To

Bcc 'AbrahamsA@dws.gov.za'; 'mokhoantlel@dws.gov.za'; 'hlengania@dws.gov.za'; 'vandykg@dws.gov.za'; 'kgapholam@dws.gov.za'; 'MsimangoP@dws.gov.za'; 'JacolineMa@daff.gov.za'; 'bfisher@ncpg.gov.za'; 'kgosimoleko@gmail.com'; 'dedat@ncpg.gov.za'; 'drpw-Info@ncpg.gov.za'; 'psaayman@ncpg.gov.za'; 'info@sahra.org.za'; 'nhiggitt@sahra.org.za'; 'nkabitin@caa.co.ca'; 'maphangas@caa.co.za'; 'phirwab@caa.co.za'; 'bslenkoe@ncpg.gov.za'; 'mvandenberg@ncpg.gov.za'; 'aphete@ncpg.gov.za'; 'sdelafontaine@gmail.com'; 'elsabe.dtec@gmail.com'; 'tperkins@grand.ncape.gov.za'; 'tmothibi@kim.agric.za.'; 'colettscholtz@gmail.com'; 'lfbfestus@gmail.com'; 'paulsedavid@gmail.com'; 'khakhane@gmail.com'

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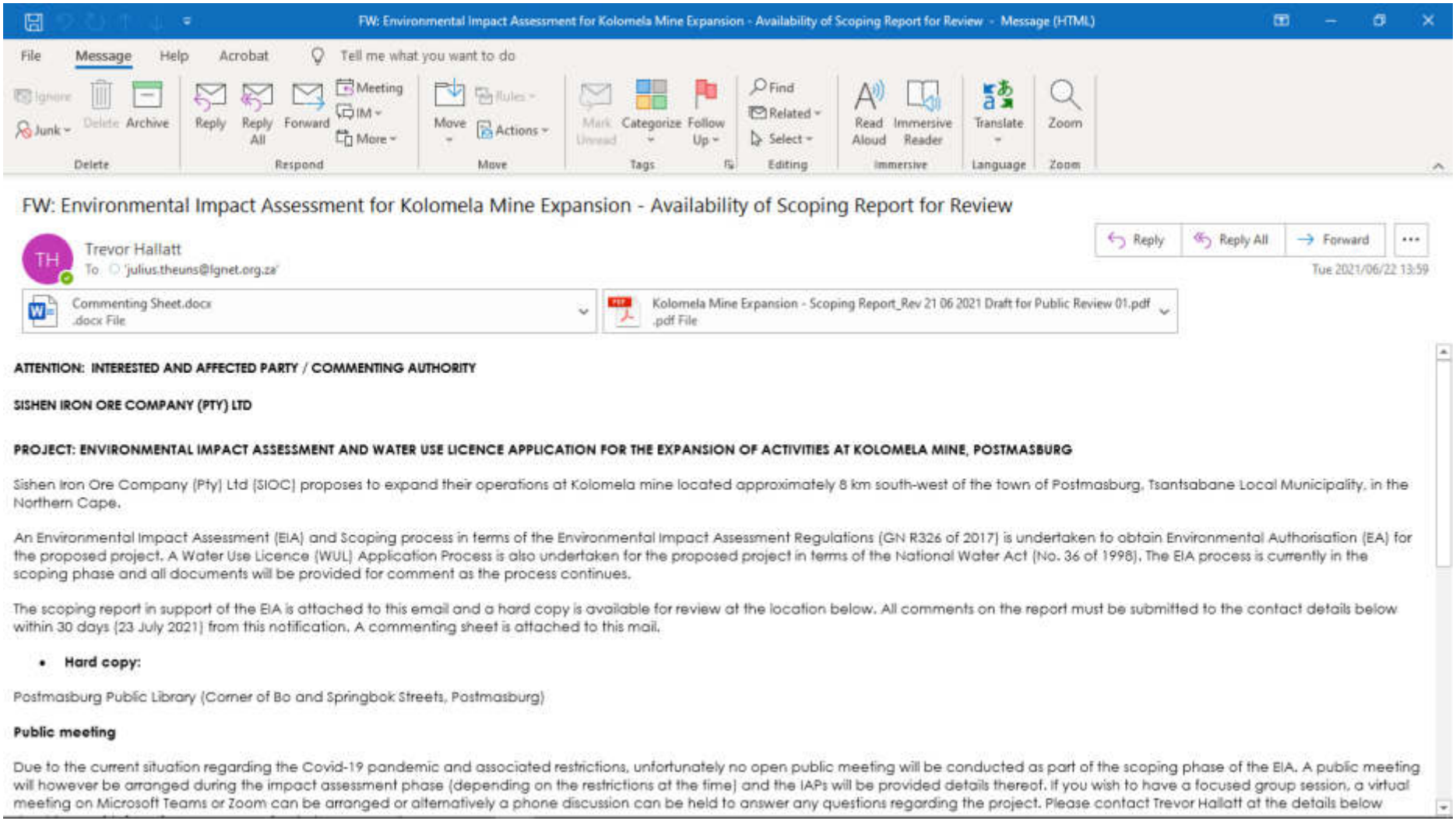
The scoping report in support of the EIA is attached to this email and a hard copy is available for review at the location below. All comments on the report must be submitted to the contact details below within 30 days (23 July 2021) from this notification. A commenting sheet is attached to this mail.

- **Hard copy:**

Postmasburg Public Library (Corner of Bo and Springbok Streets, Postmasburg)

Public meeting



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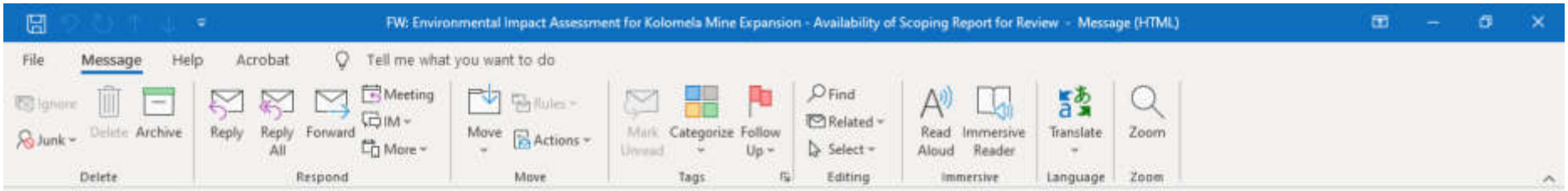
Due to the current situation regarding the Covid-19 pandemic and associated restrictions, unfortunately no open public meeting will be conducted as part of the scoping phase of the EIA. A public meeting will however be arranged during the impact assessment phase (depending on the restrictions at the time) and the IAPs will be provided details thereof. If you wish to have a focused group session, a virtual meeting on Microsoft Teams or Zoom can be arranged or alternatively a phone discussion can be held to answer any questions regarding the project. Please contact Trevor Hallatt at the details below



FW: Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

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TH

Trevor Hallatt

To

Tue 2021/06/22 13:55

Bcc mayorsec@tsantsabane.gov.za; dirtechnical@tsantsabane.gov.za; mayorsec@tsantsabane.gov.za; julius.theuns@lgnet.org.za; tsantsabane.mm@lgnet.org.za; mm@tsantsabane.gov.za; mmsec@tsantsabane.gov.za; admin@zfm-dm.gov.za; admin@zfm-dm.gov.za; premierspa@ncpg.gov.za

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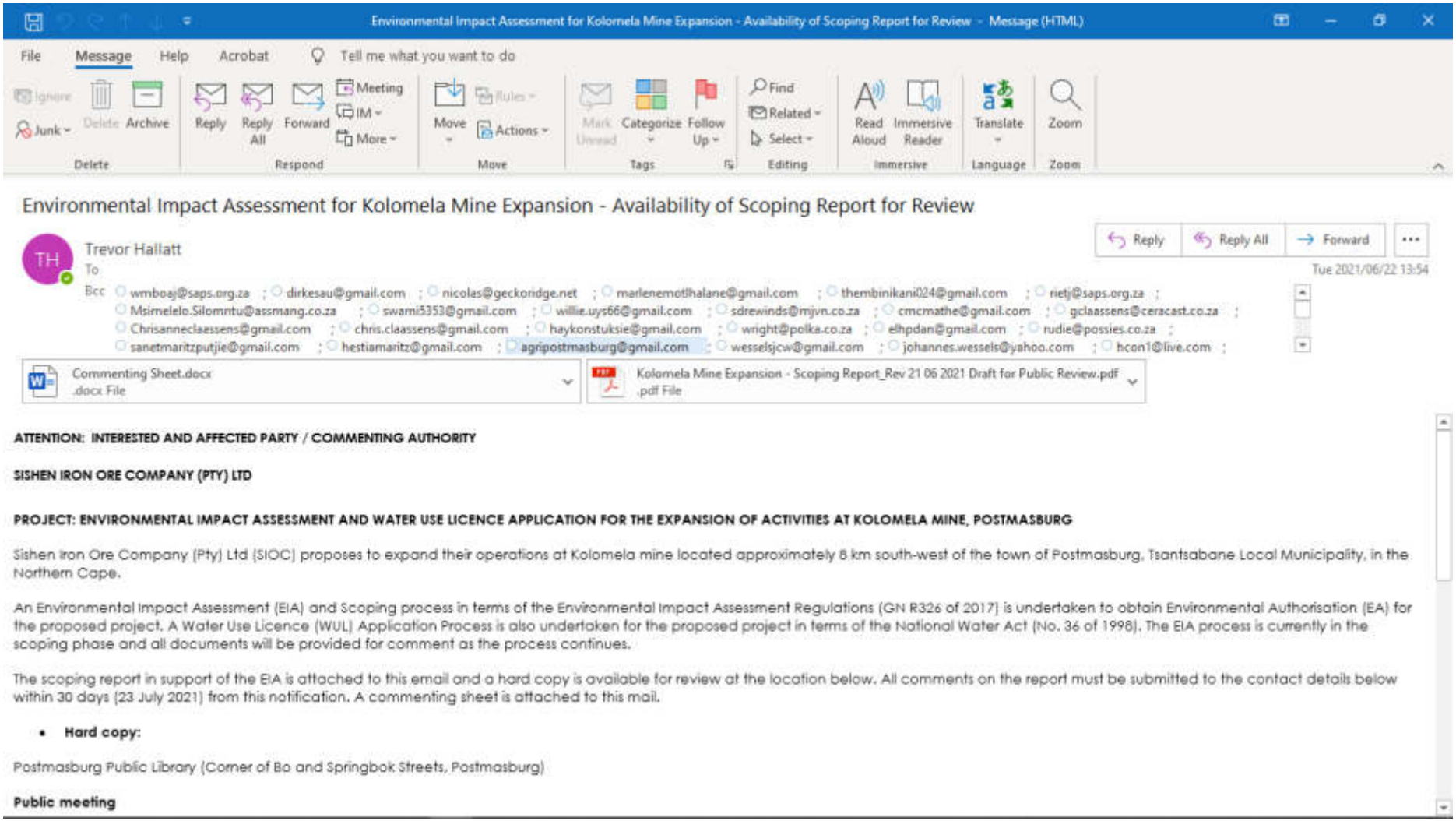

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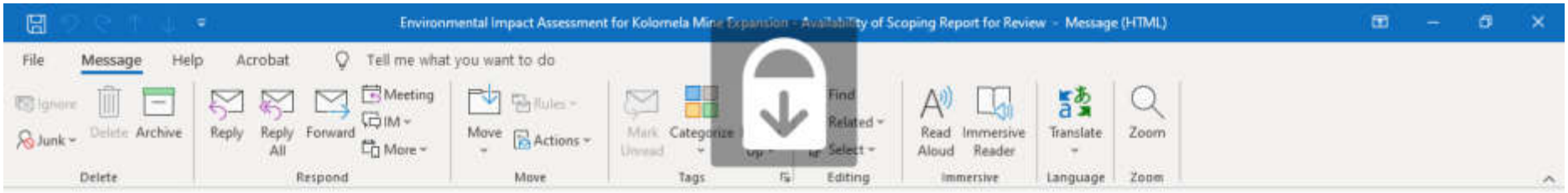

Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

TH

Trevor Hallatt

To

Bcc psbsteen@vodamail.co.za ; kobusdirk@gmail.com ; skfloradale@gmail.com ; abac223@gmail.com ; telpoortb@vodamail.co.za ; islaylinde@gmail.com ; samuelwillemse19@gmail.com ; hentie.fourie@4e-i.com ; burger_mar@yahoo.com ; sarel@kpds.co.za ; keanjopty@gmail.com ; sonetw@i2b.co.za ; renevn@me.com ; bj1958@icloud.com ; jennievis@icloud.com ; airomaroane@gmail.com ; alidokatz11@gmail.com ; joostetanje@gmail.com ; environmental@bkln.co.za ; momevdmerwe@outlook.com ; Victor Pieter

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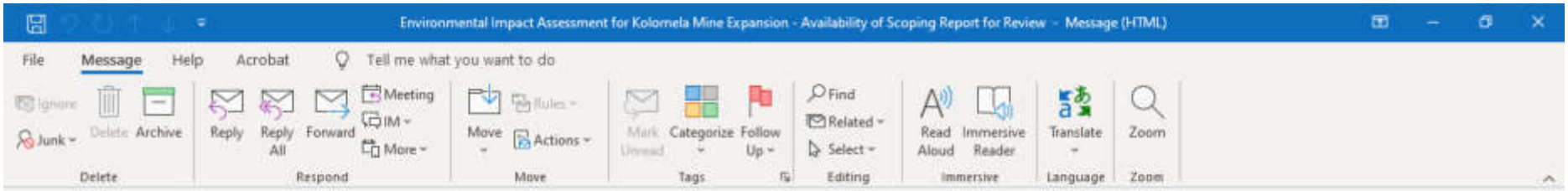

Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

TH

Trevor Hallatt

To

Bcc chrystal.vries@assmang.co.za; VANDERWALTLIENTJIE@GMAIL.COM; VANDERWALTVILJOEN@GMAIL.COM; drickus9@gmail.com; ferdinel6@gmail.com; lizbe.nel@assmang.co.za; diebakkery@xmedia.co.za; izak.gous@angloamerican.com; sakkie.gous@gmail.com; CHARL.gous@angloamerican.com; cfviljoen3@gmail.com; johan@soetfontein.co.za; info@tshiping.co.za; ajviljoen@soetfontein.co.za; marnavz@lantic.net; chris@klipbankfontein.co.za; jim@jimbos.co.za; benniebroomlands@gmail.com; briedenhann.christo@gmail.com; gibson.deidre@gmail.com; mail@thehorns.co.za; karstenJaco@gmail.com; Johan.kotze@floradaleboerdery.co.za; kalahariplanman@gmail.com; eksteenk@gmail.com;

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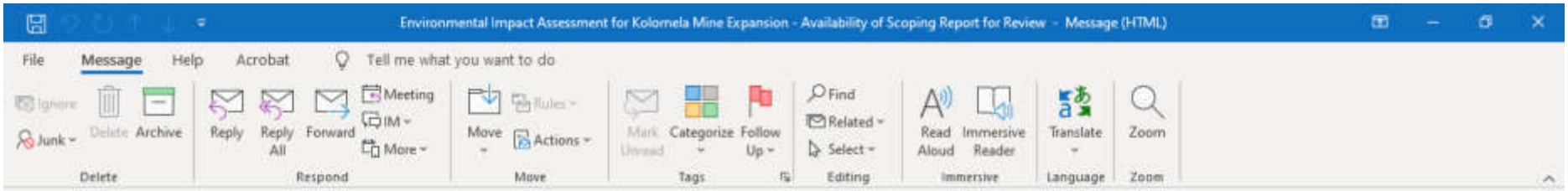

Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

TH

Trevor Hallatt

To

Bcc gibson.deidre@gmail.com; mail@thehorns.co.za; karstenlaco@gmail.com; Johan.kotze@floradaleboerdery.co.za; kalahariplanman@gmail.com; eksteenk@gmail.com; wynielubbe@gmail.com; martinmoller@telkomsa.net; janman@mjvn.co.za; tjaartpmg@lantic.net; tjsnijman@gmail.com; snymanht@gmail.com; mooidraai@lantic.net; christa@bospoort.co.za; johan@bospoort.co.za; marnavz@lantic.net; maritza.mvw@gmail.com; altus.aj@gmail.com; adam9wahl@gmail.com; samuelw73@ovi.com; momevdmerwe@outlook.com

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Public meeting

Annexure B9

Comments and Responses

Trevor Hallatt

From: Trevor Hallatt
Sent: Friday, 06 August 2021 09:30
To: 'Chrystal Vries'
Cc: Msimelelo Silomntu; Dorianne Odendaal
Subject: RE: Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

Good morning Chrystal,

Thank you for the communication received. The comment has been captured and communicated. It will be addressed as part of the process with input from Kolomela.

Kind regards
Trevor

EXM ENVIRONMENTAL SCIENCE

TREVOR HALLATT
SENIOR SCIENTIST
M.A / Pr. Sci. Nat. / EAP

M: +27 (0) 71 689 2229
E: TREVOR@EXM.CO.ZA
W: WWW.EXM.CO.ZA

From: Chrystal Vries <Chrystal.Vries@assmang.co.za>
Sent: Wednesday, 21 July 2021 07:43
To: Trevor Hallatt <trevor@exm.co.za>
Cc: Msimelelo Silomntu <Msimelelo.Silomntu@assmang.co.za>; Dorianne Odendaal <Dorianne.Odendaal@assmang.co.za>
Subject: RE: Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

Good morning Trevor

Herewith, please find comment sheet from Beeshoek Iron Ore Mine and supporting documentation in relation to the ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION: NEW AND EXPANDED ACTIVITIES AT KOLOMELA MINE.

Thank you

ASSMANG IRON ORE
BEESHOEK MINE

Chrystal Vries
Officer Environmental | Beeshoek Iron Ore Mine (Pty) Limited
Tel: +27 (0) 53 311 6408 | Mobile: +27 (0) 83 789 1696
Chrystal.Vries@assmang.co.za

From: Trevor Hallatt [mailto:trevor@exm.co.za]
Sent: Tuesday, June 22, 2021 1:51 PM
Subject: Environmental Impact Assessment for Kolomela Mine Expansion - Availability of Scoping Report for Review

ATTENTION: INTERESTED AND AFFECTED PARTY / COMMENTING AUTHORITY

SISHEN IRON ORE COMPANY (PTY) LTD

PROJECT: ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION FOR THE EXPANSION OF ACTIVITIES AT KOLOMELA MINE, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to expand their operations at Kolomela mine located approximately 8 km south-west of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape.

An Environmental Impact Assessment (EIA) and Scoping process in terms of the Environmental Impact Assessment Regulations (GN R326 of 2017) is undertaken to obtain Environmental Authorisation (EA) for the proposed project. A Water Use Licence (WUL) Application Process is also undertaken for the proposed project in terms of the National Water Act (No. 36 of 1998). The EIA process is currently in the scoping phase and all documents will be provided for comment as the process continues.

The scoping report in support of the EIA is attached to this email and a hard copy is available for review at the location below. All comments on the report must be submitted to the contact details below within 30 days (23 July 2021) from this notification. A commenting sheet is attached to this mail.

- **Hard copy:**

Postmasburg Public Library (Corner of Bo and Springbok Streets, Postmasburg)

Public meeting

Due to the current situation regarding the Covid-19 pandemic and associated restrictions, unfortunately no open public meeting will be conducted as part of the scoping phase of the EIA. A public meeting will however be arranged during the impact assessment phase (depending on the restrictions at the time) and the IAPs will be provided details thereof. If you wish to have a focused group session, a virtual meeting on Microsoft Teams or Zoom can be arranged or alternatively a phone discussion can be held to answer any questions regarding the project. Please contact Trevor Hallatt at the details below should you wish for a focus group session to be arranged.

- Contact person: Trevor Hallatt
- Cell phone nr: 071 689 2229
- Fax: 086 521 8167
- Email: trevor@exm.co.za

Kind regards

Trevor

SISHEN IRON ORE COMPANY (PTY) LTD ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION: NEW AND EXPANDED ACTIVITIES AT KOLOMELA MINE	
Name:	**Msimelelo Silomntu-Beeshoek Mine representative**
Address:	**PO Mancorp Mine**
Telephone/cell phone:	**053 311 6375/ 063 520 9191**
Fax:	**-**
E-mail:	**Msimelelo. Silomntu@assmang.co.za**
Date:	**21 July 2021**
Signature:	

If you know of others who should be informed of this application, please provide us with their contact details:

Name:	
Address:	
Telephone/cell phone:	
Fax:	
E-mail:	

ISSUES, CONCERNS AND QUESTIONS
5.3.14 Water Export Pipeline and Pump Station **Kolomela has developed a pipeline of approximately 14 km in length for the conveyance of excess water (not used in the operations) that originates from the dewatering operations. The water is pumped to the Beeshoek Reservoir from where the water is conveyed via a pipeline to supplement the Vaal-Gamagara Water Scheme. There are no proposed changes to the export water pipeline infrastructure.**
The water mentioned above is pumped to a reservoir managed by Sedibeng and not Beeshoek Mine. Beeshoek Mine taps water from the Sedibeng Reservoir, as result Sedibeng as on numerous occasions stopped the water feed to Beeshoek to cater for water needs downstream.
This negatively impacts Beeshoek Mine's plant supply, resulting in production down time and financial losses. Sedibeng justifies the stoppage of the water feed to the Mine by stating that Beeshoek Mine takes more water than what is allocated to us. Beeshoek Mine has a written agreement with Kolomela since 2012 which states that they will provide us with 320m3/h of

water to compensate for water losses sustained on the southern mining area due to Kolomela Mine dewatering. Beeshoek Mine stays well within the allocated volume.
Beeshoek Mine would like this agreement to be maintained and solidified in the Kolomela WUL. Beeshoek Mine in return will also note the agreement in their incoming WUL amendment.

Sedibeng WATER

Private Bag X5, Bothaville, 9660

(nat.) 056 515 0200
(intl.) +27 56 515 0200

(nat.) 056 515 0369
(intl.) +27 56 515 0369

www.sedibengwater.co.za
ceosec@sedibengwater.co.za

Winner of Century Quality International ERA Award

REF : IH

06 SEPTEMBER 2012

KUMBA IRON ORE LTD
Centurion Gate Building 2B
124 Akkerboom Road
Centurion
0157

Attention : Mr. Tom Verbeek

Dear Sir

RE: INCREASE IN TARIFF AT WHICH SURPLUS GROUND WATER IS BENEFICIALLY RELEASED BY SISHEN IRON ORE MINE TO SEDIBENG WATER, AS WELL AS THE SUPPLY TO BEESHOEK MINE.

Water Institute of SA Chief Executive Award

With reference to your letter dated 28 September 2011, Sedibeng Water has reviewed the options and propose the following:

a) That the proposals made by Kumba for Sishen will be accepted as per Kumba's letter dated 28 September 2011.

b) A ramp–up in tariff for Kolomela from the existing [redacted] c/ kl to [redacted] c/kl for July 2012 (backdated) up to June 2013, and then [redacted] from July 2013 up to June 2014. Further increases will be determined for the following years. Kumba will submit their proposals by September 2013.

c) For water supplied to Beeshoek reservoir that will be delivered directly to Beeshoek mine and for the volume of water that Kumba may have to stand good for due to the partial dewatering of Beeshoek's aquifer, Sedibeng Water will charge the administrative costs for handling. You mentioned a rate of 10% of the operations costs, which in this case will amount to [redacted]kl for July 2012 up to June 2013, and then [redacted]c/kl from July 2013 up to June 2014.

Award winner in the Northern Cape

This means that the normal tariffs and admin will pertain, as per point (b) above, however, Kumba will subtract the volume that was effectively delivered to Beeshoek mine via the Beeshoek reservoir from the amount billed to Sedibeng

Water and in addition pay Sedibeng Water [redacted] c/kl for that particular volume of water.

The maximum demand for Beeshoek Mine does not exceed 320m3/hr and if this supply is increased or extend past June 2014 the tariff will be revisited.

Sedibeng Water hopes these tariff arrangements are acceptable.

Yours Sincerely

R.T. Takalani
Acting Chief Executive

IRON ORE

KUMBA IRON ORE LTD
Sishen Iron Ore Company

KOLOMELA MINE
21 Main Street
Postmasburg
8420
T +27 (53) 313 7600
F +27 (86) 570 5610
South Africa

Mr Andrew Matolong
Manager Technical Services
Assmang - Beeshoek Iron Ore Mine
Beeshoek
South Africa

28th November 2012

Dear Sir

RE: Water supplied through Sedibeng Water on behalf of Kolomela Mine

This letter serves to confirm that an agreement has been signed with Sedibeng Water to supply Beeshoek Mine with water on behalf of Kolomela Mine to compensate for water lost as a result of dewatering impacts.

This agreement allows for the supply of water at an average rate of 320m^3/hr to Beeshoek mine and Kolomela will pay an administrative fee to Sedibeng for the supply of this water. A meeting will also be arranged with Sedibeng to clarify the logistical arrangement around this issue as it would seem that there is some confusion around the implementation of the agreement. We will keep you updated on this.

We request that you please forward any invoices received from Sedibeng to the Kolomela Mine Environmental Specialist, Jaco Lambrechts, for action.

Should there be any further questions, feel free to contact us.

Yours sincerely

Willem Roux
SHEQ Manager, Kolomela Mine
T: +27 (0)53 3139133
E: Willem.Roux@angloamerican.com
www.angloamericankumba.com

Trevor Hallatt

From: Trevor Hallatt
Sent: Friday, 06 August 2021 14:54
To: Morne van der Merwe
Subject: RE: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

Good day Morne,

Thank you for the comments received. As per our previous discussion, the comments in general does not directly relate to the Environmental Impact Assessment for the expansion of Kolomela. The comments have however been communicated to the relevant persons at Kolomela and they will respond as appropriate.

Please feel free to contact me should you have any additional queries.

Kind regards
Trevor

EXM ENVIRONMENTAL SCIENCE

TREVOR HALLATT
SENIOR SCIENTIST
M.A / Pr. Sci. Nat. / EAP

M: +27 (0) 71 689 2229
E: TREVOR@EXM.CO.ZA
W: WWW.EXM.CO.ZA

From: Morne van der Merwe <mornevdmerwe@outlook.com>
Sent: Friday, 21 May 2021 16:07
To: Trevor Hallatt <trevor@exm.co.za>
Subject: RE: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion
Importance: High

Trevor,

See the comments of the Northern Cape Chamber of Commerce and Industry of Postmasburg attached.

Regards

Morne van der Merwe
Chairman: NOCCI Postmasburg
E-mail: chairman@nocci-postmasburg.co.za

From: Trevor Hallatt <trevor@exm.co.za>
Sent: 12 May 2021 09:43 AM
Subject: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

ATTENTION: INTERESTED AND AFFECTED PARTY / COMMENTING AUTHORITY

SISHEN IRON ORE COMPANY (PTY) LTD

PROJECT: ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION FOR THE EXPANSION OF ACTIVITIES AT KOLOMELA MINE, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to expand and develop new activities to support the operations at Kolomela mine located approximately 8 km south-east of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape. The expansion will include the development of ore stockpile areas, tyre storage yard, changed Kapstevel opencast pit footprints, tailings management infrastructure, solar (PV) facility, additional waste rock dumps, park up and soil stockpile areas, widening and amended conveyors and haul roads, railway line, expansion of the Kapstevel At Pit Facility footprint etc.

An Environmental Impact Assessment (EIA) and Scoping process in terms of the Environmental Impact Assessment Regulations (GN R326 of 2017) is undertaken to obtain Environmental Authorisation (EA) for the proposed project. A Water Use Licence (WUL) Application Process is also undertaken for the proposed project in terms of the National Water Act (No. 36 of 1998). EXM Environmental Advisory (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) to facilitate the EIA and WUL application as well as the supporting public consultation process.

Attached please find the Background Information Document (BID) which contain all the relevant information regarding the EA and WUL application processes. The draft Scoping report in support of the application will be provided for review and comment to all IAPs in due course (within the next two weeks).

If you wish to register as an Interested and/or Affected Party or wish to provide initial comments please complete the attached comment sheet and return to the contact details below.

All registered IAPs will also be provided details of stakeholder meetings that will be conducted as part of the public consultation process.

- Contact person: Trevor Hallatt
- Cell phone nr: 071 689 2229
- Fax: 086 521 8167
- Email: trevor@exm.co.za

Kind regards

Trevor

SISHEN IRON ORE COMPANY (PTY) LTD ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION: NEW AND EXPANDED ACTIVITIES AT KOLOMELA MINE	
Name:	**Morne van der Merwe**
Address:	**17 Casper Venter Street, Postmasburg**
Telephone/cell phone:	**0824163328**
Fax:	**0865515507**
E-mail:	**mornevdmerwe@outlook.com**
Date:	**21 May 2021**
Signature:	

If you know of others who should be informed of this application, please provide us with their contact details:

Name:	**NOCCI Postmasburg**
Address:	**Northern Cape Chamber of Commerce & Industry - Postmasburg**
Telephone/cell phone:	**0824163328**
Fax:	
E-mail:	**chairman@nocci-postmasburg.co.za**

ISSUES, CONCERNS AND QUESTIONS
As business chamber we welcome the new developments but need to address the past,
current and future impacts on out town, business and industrial areas. The town is currently
under strain with past developments and the following issues need to be rectify before even
more pressure is put on our town and infrastructure:
1.With the establishment of Kolomela mine in 2010 there was a promise to upgrade the
existing R325 road to Kolomela mine through the industrial area to Beeshoek mine to
accommodate the additional traffic loads. Part of the damaged road was resurfaced, but no
upgrades were done to the existing road to accommodate traffic volumes and loads.
2. The current drive of Kumba to support local suppliers must also accommodate the new
businesses in town and industrial area. With no property available the town need Industrial
Development of serviced plots for new local suppliers?
3. Currently the town do not have a approved waste dumping site and in the meanwhile the
mine's waste contractor dump waste at the illegal municipal dumping site. The mine must

establish a new waste dumping site for their waste and that of their employees and
contractors in town?
4. The establishment of Kumba employees in Postmasburg Airfield neighbourhood remove the
only heavy vehicle bypass road around town from Griekwastad road creating additional
heavy truck traffic in town. Then Kolomela mine also source iron ore form small mines that
increase the traffic in town. The mine must build a new heavy vehicle bypass road from
Griekwastad road to Kimberley road?
5. New expansions to the mine put additional stress on the current municipal infrastructure in
Postmasburg. There is an urgent need for residential development not only for Kumba
employees but also double of the current employees to make property available for Kumba
Contractors. Currently backyards become mine hostels for contractors.
6. Bulk infrastructure needs to be upgraded for current additional contractors in backyard
hostels, informal settlements, new and future mine expansions? This includes sewer works,
pump stations, electrical, water, sewer and road infrastructure.
7. Kumba should not advertise their projects on national TV and radio because it creates an
influx of people that do not find work and become a social burden to the town? The new
projects require only local people to be employed. The previous Kolomela project with all the
new construction workers created a big burglary, drug and prostitution problem that the town
had to deal with.

Trevor Hallatt

From: Trevor Hallatt
Sent: Wednesday, 12 May 2021 10:20
To: 'Natasha Higgitt'
Subject: RE: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

Good morning,

Duly noted, an application will be submitted on SAHRIS website.

Kind regards
Trevor

From: Natasha Higgitt <nhiggitt@sahra.org.za>
Sent: Wednesday, 12 May 2021 10:18
To: Trevor Hallatt <trevor@exm.co.za>
Subject: RE: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion
Importance: Low

Good morning,

Please note that all development applications are processed via our online portal, the South African Heritage Resources Information System (SAHRIS) found at the following link: http://sahra.org.za/sahris/. We do not accept emailed, posted, hardcopy, faxed, website links or DropBox links as official submissions.

Please create an application on SAHRIS and upload all documents pertaining to the Environmental Authorisation Application Process. As per section 24(4)b(iii) of NEMA and section 38(8) of the National Heritage Resources Act, Act 25 of 1999 (NHRA), an assessment of heritage resources must form part of the process and the assessment must comply with section 38(3) of the NHRA.

Once all documents including all appendices are uploaded to the case application, please ensure that the status of the case is changed from DRAFT to SUBMITTED. Please ensure that all documents produced as part of the EA process are submitted as part of the application.

From: Trevor Hallatt <trevor@exm.co.za>
Sent: 12 May 2021 10:09
Subject: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

ATTENTION: INTERESTED AND AFFECTED PARTY / COMMENTING AUTHORITY

SISHEN IRON ORE COMPANY (PTY) LTD

PROJECT: ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION FOR THE EXPANSION OF ACTIVITIES AT KOLOMELA MINE, POSTMASBURG

Sishen Iron Ore Company (Pty) Ltd (SIOC) proposes to expand and develop new activities to support the operations at Kolomela mine located approximately 8 km south-east of the town of Postmasburg, Tsantsabane Local Municipality, in the Northern Cape. The expansion will include

Expansion of Kolomela Mine near Postmasburg, Nortern Cape

Our Ref:

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 16757

Date: Friday July 30, 2021

Interim Comment

In terms of Section 38(3), 38(8) of the National Heritage Resources Act (Act 25 of 1999)

Attention: Sishen Iron Ore Company (Pty) Ltd

Private Bag X 506
KATHU
8446

The Sishen Iron Ore Company (Pty) Ltd, part of Kumba Iron Ore Limited (hereafter Kumba), owns and operates Kolomela mine located approximately 8 km south west of Postmasburg in the Tsantsabane Local Municipality, Northern Cape Province. Kolomela proposes to expand and amend some of the existing activities and also develop new infrastructure to support continued and future production at the mine. This includes: • Expansion of the Kapstevel South Pit footprint area. • Expansion of the Kapstevel Waste Rock Dumps and haul roads. • Expansion of Kapstevel Evaporation Ponds and stormwater management infrastructure. • Additional park-up, laydown and ore stockpile areas. • Development of new DMS tailings management infrastructure • A new Photovoltaic Solar Facility. • A new Waste Tyre Management Facility. • A conveyor and railway line to transfer material to and from the DMS plant. • Expansion to the future Kapstevel DMS conveyor footprint to facilitate widened haul roads. • Expansion of Kapstevel Waste Rock Dumps and Additional Waste Rock Dumps. • Additional Low Grade Ore Storage Areas. • New radio masts. • Provision for an area of relaxation and safety berms around pits.

EXM Environmental Advisory (Pty) Ltd has been appointed by Sishen Iron Ore Company (Pty) Ltd – Kolomela Mine to conduct an Environmental Authorisation (EA) Application for proposed expansion of infrastructure and activities associated with Kolomela Mine near Postmasburg, Northern Cape Province (NC069MR).

A draft Scoping Report (DSR) has been submitted in terms of the National Environmental Management Act, 1998 (NEMA) and the 2017 Environmental Impact Assessment (EIA) Regulations for activities that trigger the Mineral and Petroleum Resources Development Act, 2002 (MPRDA)(As amended). The proposed expansion of mining activities will include the expansion of the Kapstevel South Pit, waste rock dumps and haul roads, evaporation ponds and stormwater management infrastructure, new park-up, laydown and ore stockpile areas, new tailings management infrastructure, new PV facility, new tyre waste management facility, new conveyor and railway line, expansion of conveyor footprint, additional waste rock dumps, new ore storage areas, and new radio masts.

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

The DSR notes that a Heritage Impact Assessment inclusive of a Palaeontological Impact Assessment will be conducted as part of the EIA phase of the EA application.

Interim Comment

The SAHRA Archaeology, Palaeontology and Meteorites (APM) Unit notes the pending assessment of the impact to heritage resources. The pending HIA must comply with section 38(3) of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

The archaeological component of the HIA must be conducted by a qualified archaeologist and must comply with the SAHRA 2007 Minimum Standards: Archaeological and Palaeontological Components of Impact Assessments.

The palaeontological component of the HIA must be conducted by a qualified palaeontologist and must comply with the SAHRA 2021 Minimum Standards: Palaeontological Components of Heritage Impact Assessments.

The draft EIA and appendices must be submitted in order for an informed comment to be issued.

Further comments will be issued upon receipt of the above requested documents.

Should you have any further queries, please contact the designated official using the case number quoted above in the case header.

Yours faithfully

_____

Natasha Higgitt
Heritage Officer
South African Heritage Resources Agency

an agency of the
Department of Arts and Culture

T: +27 21 462 4502 | F: +27 21 462 4509 | E: info@sahra.org.za
South African Heritage Resources Agency | 111 Harrington Street | Cape Town
P.O. Box 4637 | Cape Town | 8001
www.sahra.org.za

Enquiries: Natasha Higgitt
Tel: 021 462 4502
Email: nhiggitt@sahra.org.za
CaseID: 16757

Date: Friday July 30, 2021

Phillip Hine
Manager: Archaeology, Palaeontology and Meteorites Unit
South African Heritage Resources Agency

ADMIN:
Direct URL to case: https://sahris.sahra.org.za/node/577455
(DMR - NC, Ref: NC069MR)

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Trevor Hallatt

From: Trevor Hallatt
Sent: Wednesday, 12 May 2021 13:39
To: Tanja Jooste
Subject: RE: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion
Attachments: Aucampsrus Access Area.kmz

Good afternoon Tanja,

Please find attached the area you are referring to. The extent will be shown in the scoping report which will be provided to all parties for comment. The area is less than a hectare and will be used during the construction phase to park vehicles and store material. Please inform me if you have any other questions.

Kind regards
Trevor

EXM
SOLUTIONS | PROGRESS | PARTNERS

TREVOR HALLATT
ENVIRONMENTAL SCIENTIST
MA ENVIRONMENTAL MANAGEMENT

T: +27 (0) 10 007 3617
M: +27 (0) 71 689 2229
W: WWW.EXM.CO.ZA

From: Tanja Jooste <joostetanja@gmail.com>
Sent: Wednesday, 12 May 2021 13:22
To: Trevor Hallatt <trevor@exm.co.za>
Subject: Public Notice: Environmental Impact Assessment and Water Use Licence Application - Kolomela Mine Expansion

Good afternoon Trevor,

Please find attached hereto our request to be registered as an IAP in the abovementioned matter.

Question regarding the 'Initial Conceptual Layout' Plan on Page 4 of the Background Information Document: The legend refers to '19. Aucampsrus Access Area'.

1. Where exactly is this area (as I am unable to find it on the layout plan); and
2. What is the purpose of this area?

Looking forward to receive your response.

Kind regards

Tanja Jooste

SISHEN IRON ORE COMPANY (PTY) LTD ENVIRONMENTAL IMPACT ASSESSMENT AND WATER USE LICENCE APPLICATION: EXPANSION OF ACTIVITIES AT KOLOMELA MINE	
Name:	H2H MINING SOLUTIONS
Address:	PO Box 2473, KIMBERLEY, 8300
Telephone/cell phone:	053 861 1765
Fax:	086 636 0731
E-mail:	joostetanja@gmail.com
Date:	12 MAY 2021
Signature:	

If you know of others who should be informed of this application, please provide us with their contact details:

Name:	
Address:	
Telephone/cell phone:	
Fax:	
E-mail:	

ISSUES, CONCERNS AND QUESTIONS

Trevor Hallatt

From: gaonyadiwe Mathobela <gaonyadiwemathobela@gmail.com>
Sent: Tuesday, 22 June 2021 20:14
To: Trevor Hallatt
Subject: Kolomela Mine EIA Expansion Report

Good evening

Can you please send the above report to Tsantsabane Municipality at mmsec@tsantsabane.gov.za

Regards

H G Mathobela

Sent from my iPhone

Annexure C

Detailed Risk Assessment

Activity	IMPACT CATEGORY	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Kapstevel North and South Pits and Evaporation Dams	Soil	Removal of topsoil	Loss of soil and land capability	3	5	4	1	2,5	1	2,5	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,8	2
	Soil	Contamination of soil and soil stockpiles	Soil pollution	3	4	3,5	2	2,75	0,8	2,2		0,8	1,76
	Topography	Creation of open pit	Alteration of landscape and creation of unstable area	2	4	3	2	2,5	0,8	2	Optimise backfilling Installation of safety berms during closure	0,8	1,6
	Air quality	Blasting Haul trucks traveling on roads Exposed surfaces during pit development	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement dust suppression on haul roads and other unsurfaced roads •Dust suppression on exposed areas during construction activities. •Controlled blasting according to a blasting procedure. •Implement a community grievances and complaints management procedure.	0,9	1,98
	Air quality	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	Movement of construction vehicles Drilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•No blasting at night time as far as possible. •Controlled blasting according to a blasting procedure. •Implement a community and complaints management procedure.	0,8	1,92
	Biodiversity - Flora	Vegetation clearance Encroachment of invader plant species	Impact on floral Habitat and Diversity	4	4	4	2	3	1	3	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Restrict movement of vehicle to designated roads and footprints. •Implement offset strategy as agreed with relevant authority. •Implement AIP management plan	0,6	1,8
	Biodiversity - Flora		Impact on floral SCC	4	4	4	2	3	1	3		0,6	1,8
	Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	4	4	4	2	3	1	3	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,6	1,8
	Biodiversity - Fauna	Vegetation removal for construction purposes Earth works	Impact on SCC	4	4	4	2	3	1	3		0,6	1,8
	Surface Water Resources	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels. Refer to section related hazardous substances management.	0,8	1,44
	Hydropepelogical impacts	Establishment of infrastructure	Impact on subsurface flow and connectivity with wetlands.	1	5	3	2	2,5	0,2	0,5	No wetlands in this area	1	0,5
	Groundwater	Dewatering of aquifer	Potential impact on aquifer yield and groundwater users	5	4	4,5	4	4,25	0,8	3,4	Monitor dewatering. Monitor levels of other boreholes.	0,8	2,72
	Groundwater	Seepage from evaporation dam	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	Encroachment of identified heritage sites - no sites identified	Impact on heritage resources	3	2	2,5	2	2,25	0,4	0,9	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,8	0,72
	Visual	Visual appearance of opencast pit	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust suppression. Construct a berm along the perimeter of the open pit	0,6	1,5
	Land use and land capability	Footprint development	Loss of grazing land and change in land use	2	5	3,5	1	2,25	1	2,25	Optimise backfilling	0,8	1,8

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Leeuwfontein and Klipbankfontein Pits and Evaporation Dams	Soil	O	Removal of topsoil	Loss of soil and land capability	2	4	3	1	2	0,7	1,4	• Implement a Procedure for the Removal of Topsoil, including Vegetation. • Stripping of topsoil only allowed in demarcated and approved footprints.	0,6	0,84
	Soil	O	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	1	2	0,7	1,4		0,6	0,84
	Topography	O	Creation of open pit	Alteration of landscape and creation of unstable area	2	4	3	2	2,5	0,8	2	Optimise backfilling Installation of safety berms during closure	0,8	1,6
	Air quality	O	Blasting Haul trucks traveling on roads Exposed surfaces during pit development	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	• Implement strict speed limits on all roads. • Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. • Controlled blasting according to a blasting procedure. • Implement a community grievances and complaints management procedure.	0,9	1,98
	Air quality	O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	• Regular servicing of vehicles. • Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	O	Movement of construction vehicles Drilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	• No blasting at night time as far as possible. • Controlled blasting according to a blasting procedure. • Implement a community and complaints management procedure.	0,9	2,16
	Biodiversity - Flora	O	Vegetation clearance Encroachment of invader plant species	Impact on sensitive floral Habitat and Diversity	2	4	3	2	2,5	0,6	1,5	• Implement a Procedure for the Removal of Topsoil, including Vegetation. • Vegetation clearance only allowed in demarcated and approved footprints. • Restrict movement of vehicle to designated roads and footprints.	0,6	0,9
	Biodiversity - Flora	O		Impact on floral SCC	2	4	3	2	2,5	0,6	1,5		0,6	0,9
	Biodiversity - Fauna	O	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	4	3	1	2	0,6	1,2	• Implement strict speed limits to prevent animal strikes. • Awareness training regarding the presence of faunal species on site.	0,8	0,96
	Biodiversity - Fauna	O	Vegetation removal for construction purposes Earth works	Impact on SCC	2	4	3	1	2	0,6	1,2		0,8	0,96
	Surface Water Resources	O	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	O	Extension of Klipbankfontein footprint to the west	Destruction of additional wetland pans	4	5	4,5	3	3,75	0,7	2,625	Prevent encroachment of wetland pans as far as possible.	0,6	1,575
	Hydropepelogical impacts	O	Establishment of infrastructure	Impact on subsurface flow and connectivity with wetlands.	1	5	3	2	2,5	0,2	0,5	No wetlands in this area	1	0,5
	Groundwater	O	Dewatering of aquifer	Potential impact on aquifer yield and groundwater users	5	4	4,5	4	4,25	0,8	3,4	Monitor groundwater consumption. Monitor levels of other boreholes.	0,8	2,72
	Groundwater	O	Seepage from evaporation dam	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - Kol 7	Impact on heritage resources	3	4	3,5	2	2,75	0,8	2,2	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered. Conduct phase 2 mitigation if additional pans associated with Kol 7 will be impacted. Obtain destruction permit if required.	0,8	1,76
	Visual	C&O	Visual appearance of opencast pit	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust suppression. Construct a berm along the perimeter of the open pit	0,6	1,5

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Kapstevel North and South Pits and Evaporation Dams	Soil	C	Removal of topsoil	Loss of soil and land capability	2	5	3,5	1	2,25	1	2,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Topsoil stockpiles not exceed recommended height as per procedure •Topsoil stockpiles must be separated from areas	0,8	1,8
	Soil	C	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	2	2,5	0,8	2		0,8	1,6
	Topography	C&O	Creation of open pit	Alteration of landscape and creation of unstable area	2	4	3	2	2,5	0,8	2	Optimise backfilling Installation of safety berms during closure	0,8	1,6
	Air quality	C&O	Blasting Haul trucks traveling on roads Exposed surfaces during pit development	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. •Dust suppression on exposed areas during construction activities. •Controlled blasting according to a blasting procedure. •Implement a community grievances and complaints management procedure.	0,9	1,98
	Air quality	C&O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	C&O	Movement of construction vehicles Driilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•No blasting at night time as far as possible. •Communicate blasting times to relevant stakeholders, only when blast occur close to Klipbankfontein farmstead. •Controlled blasting according to a blasting procedure. •Implement a community and complaints management procedure.	0,7	1,68
	Biodiversity - Flora	C	Vegetation clearance Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	5	5	5	2	3,5	0,9	3,15	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Restrict movement of vehicle to designated roads and footprints. •Implement AIP management plan	0,8	2,52
	Biodiversity - Flora	C		Impact on floral SCC	4	5	4,5	2	3,25	0,9	2,925		0,8	2,34
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	4	5	4,5	2	3,25	0,9	2,925	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site.	0,8	2,34
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	4	5	4,5	2	3,25	0,9	2,925		0,8	2,34
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	O	Footprint development	Destruction of additional wetland pans	4	5	4,5	2	3,25	1	3,25	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,8	2,6
	Groundwater	C&O	Dewatering of aquifer	Potential impact on aquifer yield and groundwater users	4	4	4	4	4	0,8	3,2	Monitor dewatering volumes. Monitor levels of other boreholes.	0,8	2,56
	Groundwater	O	Seepage from evaporation dam	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - Kol 5	Impact on heritage resources	3	5	4	2	3	0,8	2,4	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered. Conduct phase 2 mitigation if additional pans associated with Kol 7 will be impacted. Obtain destruction permit if required.	0,6	1,44
	Visual	C&O	Visual appearance of opencast pit	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust suppression. Construct a berm along the perimeter of the open pit	0,6	1,5

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Leeufontein North WRD	Soil	C	Removal of topsoil	Loss of soil and land capability	2	5	3,5	1	2,25	1	2,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,8	1,8
	Soil	C	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	2	2,5	0,8	2		0,8	1,6
	Topography	C&O	Creation of WRD	Alteration of landscape	3	4	3,5	2	2,75	0,8	2,2	Concurrent rehabilitation	0,8	1,76
	Air quality	C&O	Deposition of waste rock	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,98
	Air quality	C&O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	C&O	Movement of construction vehicles Deposition of material	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•Implement a community and complaints management procedure.	0,9	2,16
	Biodiversity - Flora	C	Vegetation clearance Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity - wetland habitat	4	5	4,5	2	3,25	1	3,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Restrict movement of vehicle to designated roads and footprints. •Implement offset strategy as agreed with relevant authority.	0,8	2,6
	Biodiversity - Flora	C		Impact on floral SCC - wetland habitat	4	5	4,5	2	3,25	1	3,25		0,8	2,6
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	4	4	4	2	3	1	3	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,6	1,8
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	4	4	4	2	3	1	3		0,6	1,8
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function	5	5	5	2	3,5	1	3,5	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	2,1
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects	4	4	4	2	3	0,8	2,4	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,44
	Surface Water Resources	C&O	Runoff from WRD	Sedimentation of water courses	3	4	3,5	2	2,75	0,8	2,2	Construction of berm at toe of WRD. Concurrent rehabilitation of WRD	0,6	1,32
	Groundwater	O	Seepage from WRD	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - Kol 6	Impact on heritage resources	3	5	4	2	3	0,8	2,4	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered. Conduct phase 2 mitigation if additional pans associated with Kol 7 will be impacted. Obtain destruction permit if required.	0,6	1,44
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	3	4	3,5	3	3,25	0,9	2,9	Optimise backfilling Dust supression. Construct a berm along the perimeter of the open pit	0,6	1,74

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
	Topography	O	Creation of WRD	Alteration of landscape	3	4	3,5	2	2,75	0,8	2,2	Concurrent rehabilitation	0,8	1,76
	Air quality	O	Deposition of waste rock	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum. •Dust supression during waste deposition	0,9	1,98
	Air quality	O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	O	Movement of construction vehicles Drilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•No blasting at night time as far as possible. •Controlled blasting according to a blasting procedure. •Implement a community and complaints management procedure.	0,8	1,92
	Biodiversity - Flora	O	Vegetation clearance Encroachment of invader plant species	Impact on sensitive floral Habitat and Diversity	2	4	3	2	2,5	0,6	1,5	•Implement a Procedure for the Removal of Topsoil, including Vegetation. • A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints. •Implement offset strategy as agreed with relevant authority. •Implement heritage management plan	0,6	0,9
	Biodiversity - Flora	O		Impact on floral SCC	2	4	3	2	2,5	0,6	1,5		0,6	0,9
	Biodiversity - Fauna	O	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	4	3	1	2	0,6	1,2	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	0,96
	Biodiversity - Fauna	O	Vegetation removal for construction purposes Earth works	Impact on SCC	2	4	3	1	2	0,6	1,2		0,8	0,96
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Groundwater	O	Seepage from WRD	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on heritage resources	3	2	2,5	2	2,25	0,4	0,9	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,8	0,72
	Visual	O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust supression. Construct a berm along the perimeter of the open pit	0,6	1,5

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Kapstevel WRD	Soil	C&O	Removal of topsoil	Loss of soil and land capability	2	5	3,5	1	2,25	1	2,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Topsoil stockpiles not exceed recommended height as per procedure	0,8	1,8
	Soil	C&O	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	2	2,5	0,8	2	•Topsoil stockpiles must be separated from areas with the potential to cause pollution, i.e. use berms	0,8	1,6
	Topography	C&O	Creation of open pit	Alteration of landscape and creation of unstable area	2	4	3	2	2,5	0,8	2	Optimise backfilling Installation of safety berms during closure	0,8	1,6
	Air quality	C&O	Deposition of waste rock	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,98
	Air quality	C&O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	C&O	Movement of construction vehicles Drilling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•Implement a community and complaints management procedure.	0,9	2,16
	Biodiversity - Flora	C	Vegetation clearance Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	5	5	5	2	3,5	1	3,5	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints. •Implement offset strategy as agreed with relevant authority. •Implement AIP management plan	0,6	2,1
	Biodiversity - Flora	C		Impact on floral SCC	4	5	4,5	2	3,25	0,9	2,925		0,7	2,0475
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	5	4	4,5	2	3,25	1	3,25	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site.	0,6	1,95
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	4	5	4,5	2	3,25	0,9	2,925		0,8	2,34
	Surface Water Resources	C	Footprint development	Disturbance of drainage lines	4	3	3,5	3	3,25	0,8	2,6	Optimise footprint development. Diversion of around the WRD.	0,6	1,56
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Groundwater	O	Seepage from WRD	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Potential encroachment of identified heritage sites - KOL 4 (graves) and KOL 2	Impact on heritage resources	5	4	4,5	3	3,75	0,6	2,25	Adhere to prescribed buffers in Cultural Heritage Management Plan. Implement chance find procedure	0,6	1,35
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust suppression. Construct a berm along the perimeter of the open pit	0,6	1,5

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Klipbankfontein WRD	Soil	C	Removal of topsoil	Loss of soil and land capability	2	5	3,5	1	2,25	1	2,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Topsoil stockpiles not exceed recommended height as per procedure	0,8	1,8
	Soil	C	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	2	2,5	0,8	2	•Topsoil stockpiles must be separated from areas with the potential to cause pollution, i.e. use berms	0,8	1,6
	Topography	C&O	Creation of open pit	Alteration of landscape and creation of unstable area	2	4	3	2	2,5	0,8	2	Optimise backfilling Installation of safety berms during closure	0,8	1,6
	Air quality	C&O	Deposition of waste rock	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Implement dust suppression on haul roads and other unsurfaced roads by using a dust retardant/binding agent. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,98
	Air quality	C&O	Exhaust emissions, construction vehicles and haul trucks	Contribution to green house gas emissions.	2	4	3	2	2,5	0,6	1,5	•Regular servicing of vehicles. •Prevent unnecessary idling of trucks.	0,7	1,05
	Noise	C&O	Movement of construction vehicles Dreiling, blasting, loading and hauling	Nuisance conditions for receptors in the area.	3	3	3	3	3	0,8	2,4	•Controlled blasting according to a blasting procedure. •Implement a community and complaints management procedure.	0,9	2,16
	Biodiversity - Flora	C	Vegetation clearance Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	4	5	4,5	2	3,25	1	3,25	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints. •Implement offset strategy as agreed with relevant authority. •Implement AIP management plan	0,8	2,6
	Biodiversity - Flora	C		Impact on floral SCC	4	5	4,5	2	3,25	1	3,25		0,8	2,6
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	4	4	4	2	3	1	3	•Implement strict speed limits to prevent animal strikes. •No hunting/trapping or collecting of any faunal species is allowed other than that is authorised by the environmental department. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	2,4
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	4	4	4	2	3	1	3		0,8	2,4
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources (wetlands)	O	Footprint development	Destruction of wetland pans	4	5	4,5	2	3,25	1	3,25	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,7	2,275
	Surface Water Resources (wetlands)	O	Footprint development	Destruction of episodic drainage lines	4	5	4,5	2	3,25	1	3,25	Prevent encroachment of episodic drainage lines as far as possible. Optimise footprint to minimise impact on drainage lines.	0,7	2,275
	Groundwater	O	Seepage from WRD	Potential pollution of groundwater	3	4	3,5	3	3,25	0,6	1,95	Conduct groundwater quality monitoring at boreholes on the property.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	1	2,5	Optimise backfilling Dust suppression. Construct a berm along the perimeter of the open pit	0,6	1,5

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Klipbankfontein WRD	Soil	C	Removal of topsoil	Loss of soil and land capability	2	4	3	1	2	0,8	1,6	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,8	1,28
	Soil	C	Contamination of soil and soil stockpiles	Soil pollution	2	4	3	2	2,5	0,6	1,5		0,8	1,2
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Noise	C&O	Movement of construction vehicles	Nuisance conditions for receptors in the area.	2	2	2	2	2	0,4	0,8	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,9	0,72
	Biodiversity - Flora	C	Establish linear structure. Vegetation clearance in mountain bushveld habitat type	Impact on floral Habitat and Diversity	3	5	4	2	3	1	3	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities.	0,6	1,8
	Biodiversity - Flora	C	Impact on protected species Encroachment of invader plant species	Impact on floral SCC	3	5	4	2	3	1	3		0,6	1,8
	Biodiversity - Fauna	C	Vegetation removal for construction purposes in mountain bushveld habitat type Earth works	Impact on faunal Habitat and Diversity	4	4	4	2	3	1	3	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,6	1,8
	Biodiversity - Fauna	C	Vegetation removal for construction purposes in mountain bushveld habitat type Earth works	Impact on SCC	4	4	4	2	3	1	3		0,6	1,8
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	0,4	1	None proposed	0,6	0,6

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Widening and amendment of haul roads	Soil	C	Removal of topsoil	Loss of soil and land capability	3	4	3,5	2	2,75	1	2,75	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,6	1,65
	Soil	C	Contamination of soil and soil stockpiles	Soil pollution	3	4	3,5	2	2,75	1	2,75		0,6	1,65
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Noise	C&O	Movement of vehicles	Nuisance conditions for receptors in the area.	3	2	2,5	3	2,75	1	2,75	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,7	1,925
	Biodiversity - Flora	C	Establish linear structure. Vegetation clearance in mountain bushveld habitat type Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	4	5	4,5	2	3,25	0,8	2,6	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,7	1,82
	Biodiversity - Flora	C		Impact on floral SCC	4	5	4,5	2	3,25	0,8	2,6		0,7	1,82
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	4	4	4	2	3	0,8	2,4	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,92
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	4	4	4	2	3	0,8	2,4		0,8	1,92
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint over episodic drainage lines	Impact on episodic drainage line habitat	4	4	4	3	3,5	0,9	3,15	Implement mitigated footprint. Implement stormwater control measures.	0,7	2,205
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	0,4	1	None proposed	0,6	0,6

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
DSO Processing Plant, Contractor Laydown Areas, Workshops & Ore Stockpiles	Air quality	O	Crushing, screening and handling of ore	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	3	3,25	0,8	2,6	•Implement strict speed limits on all roads. •Dust extraction and wet scrubber system. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure.	0,6	1,56
	Noise	O	Movement of vehicles Crushing and screening operations	Nuisance conditions for receptors in the area.	3	4	3,5	3	3,25	0,6	1,95	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,7	1,365
	Surface Water Resources	O	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	O	Spillages from pollution control dams	Spillages and pollution of stormwater	4	3	3,5	4	3,75	0,6	2,25	Ensure sufficient freeboard is available at all times. Spillages to be reported and managed according to the incident management procedure. Implement measures stipulated in the stormwater management plan.	0,8	1,8
	Surface Water Resources	O	Runoff from soil stockpiles	Sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented on stockpiles situated close to water courses.	0,6	1,17
	Surface Water Resources	O	Storage of hazardous substances	Spillages and pollution of stormwater	4	4	4	3	3,5	0,8	2,8	Refer to section related to hazardous substances management	0,6	1,68
	Soil and Water Pollution	O	Waste management	Littering Environmental pollution	3	4	3,5	3	3,25	0,7	2,275	Refer to section related to waste management	0,6	1,365
	Waste Management	O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Light pollution and glare	O	Night time activity	Light pollution and glare Impact on sense of place	3	4	3,5	4	3,75	0,6	2,25	Use of yellow lights. Shield lights	0,6	1,35
	Resource use	O	Water and electricity usage	Depletion of natural resources	3	4	3,5	3	3,25	0,7	2,275	•Awareness training. •Water leaks must be reported and repaired timeously. •Optimise the reuse of water (i.e. treated sewage, water in PCDs, TSF process water). •Water spillages at the refilling station for the water bowsers must be avoided. •Investigate measures to optimise water use and saving. •Investigate the use of solar energy to supplement electricity obtained from fossil fuels. •Use of energy efficient lighting where possible. •Awareness training.	0,6	1,365
	Visual	O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	4	3,5	0,5	1,75	None proposed	0,6	1,05

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Park up areas and Soil Stockpiles	Soil	C	Removal of topsoil	Loss of soil and land capability	2	4	3	2	2,5	0,8	2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas	0,4	0,8
	Soil	C&O	Incorrect soil storage	Loss of soil integrity	3	4	3,5	2	2,75	0,8	2,2		0,4	0,88
	Soil	C	Contamination of soil and soil stockpiles due to spills at park up area	Soil pollution	3	4	3,5	2	2,75	0,8	2,2		0,6	1,32
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure.	0,9	1,35
	Noise	C&O	Movement of vehicles	Nuisance conditions for receptors in the area.	2	2	2	3	2,5	0,6	1,5	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,6	0,9
	Biodiversity - Flora	C	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,76
	Biodiversity - Flora	C		Impact on floral SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site.	0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	O	Runoff from soil stockpiles	Sedimentation of water courses	4	3	3,5	3	3,25	0,8	2,6	Erosion control measures must be implemented on soil stockpiles.	0,6	1,56
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	0,4	1	None proposed	0,6	0,6

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Tierbult (operational) and Kapstevel (to be constructed)	Soil	C	Removal of topsoil	Loss of soil and land capability	3	4	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,4	0,88
	Soil	C	Contamination of soil	Soil pollution	2	4	3	2	2,5	0,6	1,5		0,6	0,9
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Air quality	O	Crushing of low grade material	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	3	3,25	0,8	2,6	•Wet scrubber system	0,6	1,56
	Noise	C&O	Movement of vehicles	Nuisance conditions for receptors in the area.	2	2	2	3	2,5	0,6	1,5	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,6	0,9
	Biodiversity - Flora	C	Vegetation clearance for the establishment of Kapstevel DMS plant and conveyor Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	3	5	4	2	3	0,8	2,4	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,92
	Biodiversity - Flora	C		Impact on floral SCC	3	5	4	2	3	0,8	2,4		0,8	1,92
	Biodiversity - Fauna	C	Vegetation clearance for the establishment of Kapstevel DMS plant and conveyor Earth works	Impact on faunal Habitat and Diversity	3	5	4	2	3	0,8	2,4	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,92
	Biodiversity - Fauna	C		Impact on SCC	3	5	4	2	3	0,8	2,4		0,8	1,92
	Surface Water Resources	C	Ineffective stormwater management	Sedimentation of water courses	4	3	3,5	3	3,25	0,8	2,6	Improve stormwater management at Tybalt DMS plant.	0,8	2,08
	Surface Water Resources	C&O	Construction of Klipbankfontein at pit facility Construction of conveyor	Destruction of additional wetland pans Change to wetland hydrological function Only one pan to be affected by conveyor	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected by conveyor	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint of conveyor over episodic drainage lines Spillage of material from conveyor on episodic drainage lines	Impact on episodic drainage line habitat	4	4	4	2	3	1	3	Rehabilitate disturbed are at episodic drainage line. Product spillages to be cleaned appropriately	0,6	1,8
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on heritage site	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Light pollution and glare	O	Night time activity	Light pollution and glare Impact on sense of place	3	4	3,5	4	3,75	0,6	2,25	Use of yellow lights. Shield lights Direct lights away from receptors.	0,6	1,35
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	3	4	3,5	2	2,75	0,4	1,1	None proposed	1	1,1

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
DSO Tailings Storage Facility	Groundwater	O	Seepage into groundwater	Groundwater contamination	4	4	4	4	4	0,7	2,8	Divert tailings process water to lined return water dam. Groundwater quality monitoring	0,6	1,68
	Air quality	O	Dust and PM emissions	Nuisance conditions	3	4	3,5	3	3,25	0,6	1,95	Revegetate side walls	0,6	1,17
	Surface Water Resources	O	Tailings spillages	Surface water contamination	3	4	3,5	2	2,75	0,8	2,2	Clean up any tailings spillages. Large spillages logged as incidents.	0,6	1,32
	Water resources	O	Reuse of tailings water	Reduce dependency on water resources	3	4	3,5	2	2,75	0,8	2,2	Optimise reuse of water	1	2,2
	Visual	O	Visual appearance of WRD	Visual intrusion of facility	3	4	3,5	2	2,75	0,4	1,1	None proposed. Establish end land use.	1	1,1

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
DSO Tailings Storage Facility	Groundwater	O	Seepage into groundwater	Groundwater contamination	4	4	4	4	4	0,7	2,8	Divert tailings process water to lined return water dam. Groundwater quality monitoring	0,6	1,68
	Safety	C&O	Structural failure	Safety concerns	5	4	4,5	3	3,75	0,6	2,25	Ensure TSF is designed and operated in terms of the design report. Adhere to Construction Quality Insurance requirements. Construction to be supervised by competent person.	0,6	1,35
	Air quality	C	Dust and PM emissions due to material movement	Nuisance conditions	3	3	3	3	3	0,6	1,8	Dust suppression if required. Dust fall monitoring.	0,6	1,08
	Air quality	O	Dust and PM emissions	Nuisance conditions	3	4	3,5	3	3,25	0,6	1,95	Deposition of wet tailings will prevent dust emissions.	0,7	1,365
	Surface Water Resources	O	Tailings spillages	Surface water contamination	3	4	3,5	2	2,75	0,8	2,2	Clean up any tailings spillages. Large spillages logged as incidents. Inspection of pipelines.	0,6	1,32
	Water resources	O	Reuse of tailings water	Reduce dependency on water resources	3	4	3,5	2	2,75	0,8	2,2	Optimise reuse of water	1	2,2
	Visual	O	Visual appearance of WRD	Visual intrusion of facility	3	4	3,5	2	2,75	0,6	1,65	None proposed.	1	1,65

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Conveyor and Railway Line from Tierbult DMS Plant	Soil	C	Removal of topsoil	Loss of soil and land capability	2	4	3	2	2,5	0,8	2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas	0,4	0,8
	Soil	O	Contamination of soil and soil stockpiles due to tailings spills	Soil pollution	2	4	3	2	2,5	0,8	2		0,6	1,2
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Noise	C&O	Movement of vehicles	Nuisance conditions for receptors in the area.	2	2	2	3	2,5	0,6	1,5	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery •Noise monitoring	0,6	0,9
	Biodiversity - Flora	C	Impact on protected species	Impact on floral Habitat and Diversity Small section of cryptic wetland habitat affected	3	5	4	2	3	0,8	2,4	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,92
	Biodiversity - Flora	C	Encroachment of invader plant species	Impact on floral SCC Small section of cryptic wetland habitat affected	3	5	4	2	3	0,8	2,4		0,8	1,92
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	3	5	4	2	3	0,6	1,8	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site.	0,8	1,44
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	3	5	4	2	3	0,6	1,8		0,8	1,44
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	O	Product spillage	Sedimentation of water courses	4	3	3,5	3	3,25	0,8	2,6	Erosion control measures must be implemented near water courses if necessary	0,6	1,56
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Footprint will be outside 32 m zone, however edge effects is anticipated	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Footprint will be outside 32 m zone, however edge effects is anticipated	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Main Administration, Offices and Workshops	Noise	O	Movement of vehicles	Nuisance conditions for receptors in the area.	1	4	2,5	3	2,75	0,4	1,1	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,7	0,77
	Surface Water Resources	O	Storage and use of hazardous substances	Spillages and pollution of stormwater	4	4	4	3	3,5	0,8	2,8	Refer to section related to hazardous substances mangement	0,6	1,68
	Soil and Water Pollution	O	Waste management	Littering Environmental pollution	3	4	3,5	3	3,25	0,7	2,275	Refer to section related to waste mangement	0,6	1,365
	Light pollution and glare	O	Night time activity	Light pollution and glare Impact on sense of place	2	4	3	3	3	0,6	1,8	Use of yellow lights. Shield lights	0,6	1,08
	Resource use	O	Water and electricity usage	Depletion of natural resources	3	4	3,5	3	3,25	0,7	2,275	•Awareness training. •Water leaks must be reported and repaired timeously. •Optimise the reuse of water (i.e. treated sewage, water in PCDs, TSF process water). •Water spillages at the refilling station for the water bowsers must be avoided. •Investigate measures to optimise water use and saving. •Investigate the use of solar energy to supplement electricity obtained from fossil fuels. •Use of energy efficient lighting where possible. •Awareness training.	0,6	1,365
	Visual	O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	4	3,5	0,5	1,75	None proposed	0,6	1,05

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
At Pit Facilities (Kapstevel and Klipbankfontein) including access roads and parking areas	Soil	C	Removal of topsoil	Loss of soil and land capability	3	4	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas	0,4	0,88
	Soil	C	Contamination of soil and soil stockpiles due to spills at park up area	Soil pollution	2	4	3	2	2,5	0,8	2		0,6	1,2
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Implement strict speed limits on all roads. •Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Noise	C&O	Movement of vehicles	Nuisance conditions for receptors in the area.	2	2	2	3	2,5	0,6	1,5	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,6	0,9
	Biodiversity - Flora	C	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,76
	Biodiversity - Flora	C		Impact on floral SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Surface Water Resources	C	Runoff from exposed surfaces	Erosion and sedimentation of water courses	4	3	3,5	3	3,25	0,6	1,95	Erosion control measures must be implemented at borrow pit if required.	0,8	1,56
	Surface Water Resources	C	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	O	Bulk storage and use of hazardous substances. Refueling station	Spillages and pollution of stormwater	5	4	4,5	3	3,75	0,8	3	Refer to section related to hazardous substances mangement. Refueling to be conducted in a dedicated area with proper drainage in place.	0,6	1,8
	Soil and Water Pollution	O	Waste management	Littering Environmental pollution	3	4	3,5	3	3,25	0,7	2,275	Refer to section related to waste mangement	0,6	1,365
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Encroachment of episodic drainage lines	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans and episodic drainage lines that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Heritage	C	Encroachment of identified heritage sites - no sites identified	Impact on burial ground and graves	3	2	2,5	2	2,25	0,6	1,35	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,6	0,81
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	0,4	1	None proposed	0,6	0,6

Activity	IMPACT CATEGORY	PHASE	ASPECT
Export pipeline, access road, railway line	Biodiversity	O	Movement barrier
	Hydrology	O	Hydrology barrier
	Water resources	O	Water leakages from pipeline
	Light pollution	O	Night time activities Lights at railway line

POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Restrict animal movement Animal strikes	4	4	4	3	3,5	0,8	2,8	•Implement strict speed limits to prevent animal strikes. •Culverts should be installed (where practicable and if possible) along any drainage lines under roads and fences to allow for the movement of smaller species (particularly small mammals and reptiles).	0,6	1,68
Flood risk during high rainfall events	3	4	3,5	2	2,75	0,8	2,2	Clear obstacles from culverts.	0,8	1,76
Reduce dependency on water resources	3	4	3,5	2	2,75	0,8	2,2	Fix any leaks timeously. Inspect pipeline for leaks.	0,8	1,76
Glare and sky glow	2	4	3	3	3	0,7	2,1	Investigate the shielding of lights Direct light downwards	0,8	1,68

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Bulk Hydrocarbon Storage, LDV and Loco Refuelling Areas, Explosives Magazine	Public Safety	O	Storage of explosives	Explosions	1	4	2,5	3	2,75	0,4	1,1	Strict access control to explosives magazine. Only trained staff to handle explosives.	0,7	0,77
	Surface Water Resources and Soil	O	Storage and use of hazardous substances	Large scale spillages and pollution of stormwater/soil	4	4	4	4	4	0,8	3,2	Refer to section related to hazardous substances mangement. Refueling to be conducted in dedicated area with stormwater measures in place to capture spillages. Contaminated soil to be excavated and treated at the bioremediation facility. Explosives to be stored in roofed buildings/enclosed structures. Strict access control to explosives magazine.	0,6	1,92
	Groundwater	O	Potential leaks and seepage	Groundwater pollution	3	4	3,5	3	3,25	0,7	2,275	Pressure tests on tanks. Groundwater monitoring. Store hazardous substances only in compatible containers/tanks.	0,6	1,365
	Biodiversity - Flora	C	Expansion of explosives magazine. Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,76
	Biodiversity - Flora	C		Impact on floral SCC	2	5	3,5	2	2,75	0,6	1,65		0,8	1,32
	Biodiversity - Fauna	C	Expansion of explosives magazine. Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,76
	Biodiversity - Fauna	C		Impact on SCC	2	5	3,5	2	2,75	0,6	1,65		0,8	1,32

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Perimeter fence and road	Air quality	O	Vehicle movement on unpaved road	Increased dust fall and PM emissions. Nuisance conditions	3	4	3,5	2	2,75	0,8	2,2	•Implement strict speed limits on all roads. •Dust suppression on unpaved roads	0,7	1,54
	Noise	O	Movement of vehicles	Nuisance conditions for receptors in the area.	2	2	2	3	2,5	0,6	1,5	•Implement a community and complaints management procedure. •Maintenance of vehicles and machinery	0,6	0,9
	Fire management	O	Lack of fire breaks	Uncontrolled fires affecting neighbouring properties	4	4	4	3	3,5	0,8	2,8	•Ensure fire breaks are maintained. •Fire-fighting equipment must be readily available. •Ensure adequate communication with neighbours regarding fires.	0,6	1,68
	Social	O	Lack of maintenance on fence	People gain access to fence	3	4	3,5	2	2,75	0,8	2,2	Implement a fence maintenance agreement with adjacent land owners, which stipulates the roles and responsibilities of the parties involved and how the maintenance of fences will be managed.	0,6	1,32

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Artificial Aquifer Discharge Pipeline	Groundwater	O	Discharge into aquifer	Recharge aquifer and increase yield	3	4	3,5	2	2,75	1	2,75	None	1	2,75
	Biodiversity - Flora	O	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity Encroachment of areas not disturbed during construction.	2	5	3,5	2	2,75	0,8	2,2	Prohibit movement into areas not disturbed by development.	0,8	1,76
	Biodiversity - Fauna	O	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity Encroachment of areas not disturbed during construction.	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Surface Water Resources	O	Encroachment of groenwaterspruit wetland system	Impact on wetland habitat	3	3	3	3	3	0,8	2,4		0,8	1,92

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Low Grade Product Stockpiles and Waste Tyre Yard	Soil	C	Removal of topsoil	Loss of soil and land capability	2	4	3	2	2,5	0,8	2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas.	0,4	0,8
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Biodiversity - Flora	C	Impact on protected species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,76
	Biodiversity - Flora	C	Encroachment of invader plant species	Impact on floral SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Surface Water Resources	C	Footprint development	Disturbance of episodic drainage lines	4	3	3,5	3	3,25	0,8	2,6	Implement mitigated layout. Areas must be clearly demarcated for stockpiling No further encroachment of episodic drainage line.	0,6	1,56
	Surface Water Resources	O	Runoff from soil stockpiles	Sedimentation of water courses	4	3	3,5	3	3,25	0,8	2,6	Erosion control measures must be implemented on soil stockpiles close to episodic drainage lines.	0,6	1,56
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Prevent encroachment of wetland pans as far as possible. Optimise footprint to minimise number of pans that will be impacted.	0,6	1,32
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only one pan to be affected	3	4	3,5	2	2,75	0,8	2,2	Demarcate no-go areas. Prevent travelling into adjacent areas.	0,6	1,32
	Heritage	C	Encroachment of identified heritage sites	Impact on KME-08 (insignificant heritage resource)	2	2	2	1	1,5	0,8	1,2	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,4	0,48
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	2	4	3	2	2,5	0,4	1	None proposed	0,6	0,6

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Waste Tyre Management Facility	Soil	C	Removal of topsoil	Loss of soil and land capability	3	4	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas.	0,4	0,88
	Safety	O	Stockpiling tyres	Fire hazard	4	4	4	3	3,5	0,8	2,8	•Appropriate fire fighting equipment must be available at the facility •Fire breaks to be established and maintained	0,6	1,68
	Air quality	C	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Biodiversity - Flora	C	Impact on protected species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,7	1,925	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •A contractor must obtain authorisation in the form of a permit from the Kolomela environmental department for the clearance of an area. The application must include the area of the proposed development and the planned activities. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,54
	Biodiversity - Flora	C	Encroachment of invader plant species	Impact on floral SCC	2	5	3,5	2	2,75	0,7	1,925		0,8	1,54
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Surface Water Resources	C	Footprint development	Disturbance of wetland pans Only two pans to be potentially affected	4	3	3,5	3	3,25	0,8	2,6	Implement mitigated layout.	0,6	1,56
	Surface Water Resources	C&O	Extension of footprint - edge effects	Loss of wetland pan habitat and ecological structure - edge effects Only two pans to be potentially affected	3	4	3,5	2	2,75	0,8	2,2	Areas must be clearly demarcated. No further encroachment of wetland pans.	0,6	1,32

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Sewage Treatment Works	Nuisance conditions	O	Inadequate management of facility	Noisance conditions	4	4	4	2	3	0,7	2,1	•Only trained employees to operate sewage treatment works	0,9	1,89
	Soil and stormwater pollution	C	Sewage spillages	Soil and water pollution	3	5	4	2	3	0,7	2,1	•Facility to be operated according to manual. •Enclosed system for discharge.	0,8	1,68
	Water use	C	Reuse of treated sewage	Reduce dependency on water resources	2	5	3,5	2	2,75	0,8	2,2	Optimise reuse of treated sewage.	1	2,2

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Exploration sites	Soil	C	Removal of topsoil	Loss of soil and land capability	2	4	3	2	2,5	0,8	2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,4	0,8
	Surface Water Resources	C&O	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Surface Water Resources	O	Storage and use of hazardous substances	Spillages and soil pollution	4	4	4	3	3,5	0,8	2,8	Refer to section related to hazardous substances mangement	0,6	1,68
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Biodiversity - Flora	C	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	3	5	4	2	3	0,8	2,4	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Concurrent rehabilitation of exploration sites. •Obtain permits for removal of protected plants.	0,8	1,92
	Biodiversity - Flora	C		Impact on floral SCC	3	5	4	2	3	0,8	2,4		0,8	1,92
	Biodiversity - Fauna	C	Vegetation removal	Impact on faunal Habitat and Diversity	3	5	4	2	3	0,8	2,4	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site.	0,8	1,92
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	3	5	4	2	3	0,8	2,4		0,8	1,92
	Surface Water Resources	C&O	Extension of footprint	Destruction of additional wetland pans Change to wetland hydrological function	4	4	4	3	3,5	0,6	2,1	Plan exploration sites to prevent encroachment of wetland pans as far as possible.	0,6	1,26
	Heritage	C	Encroachment of identified heritage sites	Impact on heritage resource	2	2	2	1	1,5	0,8	1,2	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,4	0,48

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Exploration core yard and radio masts	Soil	C	Removal of topsoil	Loss of soil and land capability	1	4	2,5	2	2,25	0,8	1,8	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,4	0,72
	Surface Water Resources	C&O	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Biodiversity - Flora	C	Impact on protected species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Concurrent rehabilitation of exploration sites. •Obtain permits for removal of protected plants.	0,8	1,76
	Biodiversity - Flora	C	Encroachment of invader plant species	Impact on floral SCC	1	5	3	2	2,5	0,8	2		0,8	1,6
	Biodiversity - Fauna	C	Vegetation removal	Impact on faunal Habitat and Diversity	1	5	3	2	2,5	0,8	2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site.	0,8	1,6
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	1	5	3	2	2,5	0,8	2		0,8	1,6
	Surface Water Resources	C&O	Footprint of core yard wihin 32 meters of episodic drainage line	Encroachment of riparian zone	3	4	3,5	3	3,25	0,8	2,6	Demarcate area for site establishment. Implement mitigated layout.	0,6	1,56
	Heritage	C	Encroachment of identified heritage sites	Impact on heritage resource	2	2	2	1	1,5	0,8	1,2	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,4	0,48

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Low Grade Product Stockpiles	Soil	C	Removal of topsoil	Loss of soil and land capability	3	4	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Plan soil stockpile positions according to future development footprints to prevent further disturbance. •Stripping of topsoil only allowed in demarcated and approved footprints. •Soil stockpiles must be separated from park up areas.	0,4	0,88
	Soil	C&O	Contamination of soil and soil stockpiles	Soil pollution	3	4	3,5	2	2,75	0,8	2,2	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,76
	Surface Water Resources	C&O	Storage and use of hazardous substances	Spillages and soil pollution	4	4	4	3	3,5	0,8	2,8	Refer to section related to hazardous substances mangement	0,6	1,68
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	3	3	3	3	3	0,7	2,1	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,89
	Green house gas emissions	O	Reduction in dependency on fossil fuel energy	Decreased carbon footprint	3	3	3	3	3	1	3	None proposed	1	3
	Biodiversity - Flora	C	Footprint development	Loss of avifaunal habitat, species and avifaunal SCC	3	5	4	2	3	0,7	2,1	-•Bird nests on powerlines or the PV infrastructure are potential fire hazards and should be removed from structures regularly; and -•Monitoring (every 2 months) should be undertaken for the 1st year and a record of potential bird strikes •Implement a Procedure for the Removal of Topsoil, including Vegetation. •Vegetation clearance only allowed in demarcated and approved footprints. •Obtain relevant permits for the removal of protected species. •Concurrent rehabilitation of areas temporarily disturbed by construction activities. •Restrict movement of vehicle to designated roads and footprints.	0,8	1,68
	Biodiversity - Flora	C	Impact on protected species Encroachment of invader plant species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Flora	C		Impact on floral SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on faunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site. •The Procedure for the Removal of Topsoil should stipulate that the site must be inspected by the environmental department prior to disturbance to detect any faunal species. Relevant permits should be obtained if any protected species are encountered.	0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Avifauna	C	Vegetation removal for construction purposes Earth works	Avifaunal Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	-The development footprint should be demarcated, and it should be ensured that no development related activities take place outside of the demarcated footprint; -Any structures which may act as perching sites for birds should be installed with anti-perching spikes; -Should any lights be installed they should face downwards to reduce the abundance of insects attracted to the night lights. This prey source may attract birds to the study area and may increase avian collisions or electrocutions; -Avifaunal habitat beyond the demarcated area should not be cleared or altered -No collection of avifaunal SCC or their eggs may be allowed by construction personnel; -No illicit / uncontrolled fires must be allowed during the construction phase of the proposed development.	0,8	1,76
	Biodiversity - Avifauna	C	Vegetation removal for construction purposes Earth works	Avifaunal Species of Conservation Concern	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Water Use	O	Water use for maintenance purposes	Increased pressure on water resources	3	4	3,5	3	3,25	0,8	2,6	Optimise water use for cleaning of PV panels. Investigate reuse of water.	0,7	1,82
	Surface Water Resources	C	Footprint development	Disturbance of episodic drainage lines	3	3	3	3	3	0,6	1,8	Implement mitigated layout. Areas must be clearly demarcated for stockpiling No further encroachment of episodic drainage line.	0,6	1,08
	Surface Water Resources	O	Increased surface water runoff volume and velocity	Erosion of adjacent areas and downstream episodic drainage lines	3	4	3,5	4	3,75	0,6	2,25	Stormwater management to evenly dissipate runoff from the site.	0,6	1,35
	Heritage	C	Encroachment of identified heritage sites	Impact on heritage resources	2	2	2	1	1,5	0,7	1,05	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,4	0,42
	Visual	C&O	Visual appearance of WRD	Visual intrusion of facility	3	4	3,5	2	2,75	0,4	1,1	None proposed	1	1,1

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
	Air quality	C	Crushing	Increased dust fall and PM emissions. Nuisance conditions	3	3	3	3	3	0,6	1,8	None	0,9	1,62
	Noise	C	Crushing	Increased noise levels	3	3	3	3	3	0,6	1,8	None	0,9	1,62

Activity	IMPACT CATEGORY	PHASE	ASPECT	POTENTIAL IMPACT	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Autonomous haul trucks (LTE towers, Control Area, Lookout tower	Soil	C	Removal of topsoil	Loss of soil and land capability	1	4	2,5	2	2,25	0,8	1,8	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Stripping of topsoil only allowed in demarcated and approved footprints.	0,4	0,72
	Surface Water Resources	C&O	Spillages	Pollution of surface water resources	3	3	3	3	3	0,6	1,8	Temporary toilets to be provided during construction. Use a registered contractor to empty toilets. Good house keeping must be applied to maintain high hygienic levels.	0,8	1,44
	Air quality	C&O	Soil disturbance	Increased dust fall and PM emissions. Nuisance conditions	2	4	3	2	2,5	0,6	1,5	•Dust suppression on exposed areas during construction activities. •Implement a community grievances and complaints management procedure. •Present monitoring results at Kolomela environmental forum.	0,9	1,35
	Biodiversity - Flora	C	Impact on protected species	Impact on floral Habitat and Diversity	2	5	3,5	2	2,75	0,8	2,2	•Implement a Procedure for the Removal of Topsoil, including Vegetation. •Concurrent rehabilitation of exploration sites. •Obtain permits for removal of protected plants.	0,8	1,76
	Biodiversity - Flora	C	Encroachment of invader plant species	Impact on floral SCC	2	5	3,5	2	2,75	0,8	2,2		0,8	1,76
	Biodiversity - Fauna	C	Vegetation removal	Impact on faunal Habitat and Diversity	2	4	3	2	2,5	0,8	2	•Implement strict speed limits to prevent animal strikes. •Awareness training regarding the presence of faunal species on site.	0,8	1,6
	Biodiversity - Fauna	C	Vegetation removal for construction purposes Earth works	Impact on SCC	2	4	3	2	2,5	0,8	2		0,8	1,6
	Surface Water Resources	C&O	Encroachment of episodic drainage lines	Encroachment of riparian zone	3	4	3,5	3	3,25	0,6	1,95	Demarcate area for site establishment. Implement mitigated layout.	0,6	1,17
	Heritage	C	Encroachment of identified heritage sites	Impact on heritage resource	2	2	2	1	1,5	0,8	1,2	Implement a chance find procedure as stipulated in the Kolomela heritage management plan in case where possible heritage finds are uncovered.	0,4	0,48

IMPACT CATEGORY	POTENTIAL IMPACT	PHASE	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Socio-economic	Local procurement and enterprise development	O	2	4	3	4	3,5	1	3,5	Preferential procurement plan. Kumba supplier development programme.	1	3,5
Socio-economic	Local employment	O	3	4	3,5	4	3,75	1	3,75	Social and Labour Plan commitments and implementation of the mine's local recruitment policy. Collaboration with the municipality's unemployment forum. In addition: Local employment commitments from contractors and monitoring thereof.	1	3,75
Socio-economic	Catalyst for local economic development	Construction	4	4	4	4	4	1	4	Participation in the municipal IDP and LED Forums. Collaboration and engagement with local business organisations. In addition: Encouraging contractors and other service providers to recruit and procure locally. Collaboration with regional LED structures to enhance economic development in the Gamagara Corridor.	1	4
Socio-economic	Enhancement of community skills levels	Operations	2	4	3	4	3,5	0,8	2,8	Promote the Kolomela Community Skills Centre in local communities. Bursary scheme. Scholarship scheme. Internship programme. Investigations to establish a technical subjects section at Postmasburg secondary school. Investigations on the establishment of an FET	1	2,8
Socio-economic	Enhanced infrastructure development	Construction and operations	3	3	3	4	3,5	1	3,5	SLP commitments, aligned with the municipal IDP TSASSAMBA Public Private Partnership with Beeshoek mine and Tsantsabane Local Municipality	1	3,5
Socio-economic	Improved access to, and quality of school education	Operations	4	4	4	4	4	1	4	SLP and CSI projects focusing on education. Effective engagement with the relevant levels of government when implementing projects. In addition: Agreements with largest contractors to also contribute to education projects, in coordination with Kolomela's planned initiatives. Regular needs assessment at schools.	1	4
Socio-economic	Improved access to, and quality of public healthcare services	Construction and operations	3	4	3,5	4	3,75	1	3,75	Extension of the District hospital. Construction of accommodation for health professionals. In addition: Engagement with role players in the public health sector to inform them of the possible impact of the project. Agreements with largest contractors to also contribute to health related projects, in coordination with Kolomela's planned initiatives. Regular needs assessment at public health institutions.	1	3,75
Socio-economic	Support of the local municipality enhances service delivery	Construction	2	3	2,5	4	3,25	1	3,25	Capacity building programme with DBSA. Support to the municipality as part of the Operation and Maintenance agreement. Support to the municipality in rolling out a pre-paid water metering system.	1	3,25
Socio-economic	Pressure on municipal services and capacity due rapidly growing population	Construction and operations	3	4	3,5	4	3,75	1	3,75	Capacity building and support initiatives to alleviate pressure on the municipality. In addition: Guide contractors to communicate and recruit responsibly.	0,8	3
Socio-economic	A shortage of proper and affordable housing due to the demand created by mining (poor living conditions in informal settlements)	Construction and operations	3	4	3,5	4	3,75	1	3,75	Housing policy and building of additional houses (including rental stock) for employees. Project to provide accommodation for public service health professionals.	0,8	3
Socio-economic	Dust, noise and dewatering impacting the farming community's quality of life and livelihoods	Construction and operations	3	5	4	3	3,5	0,8	2,8	Environmental Forum for engagement. Existing dust suppression initiatives. Existing dust, and vibration monitoring. Continue with monitoring of groundwater quality and levels. In addition: Implementation of mitigating measures as outlined in specialist reports. Effective engagement with affected parties, around the project in particular (not just business as usual).	1	2,8
Socio-economic	Increase in social ills (e.g. crime, prostitution, substance abuse, teenage pregnancies) linked to population growth, poor living conditions, and contractors' employment practices	Construction and operations	4	3	3,5	4	3,75	0,8	3	Planned programmes and initiatives to enhance social wellness in Tsantsabane through continued support of, and collaboration with institutions and organisations involved in combatting social ills. In addition: Develop a procedure for the management of contractors' social impacts and negotiate the implementation of the procedure with internal role players as well as key contractors.	1	3
Socio-economic	Strained relationships with selected stakeholders due to unmet expectations of economic benefits from the mine	Construction and operations	3	3	3	4	3,5	0,8	2,8	Engagement plan to ensure that stakeholders are being kept up to date with the project and the opportunities for local community members – management of expectations. Effective engagement with key stakeholders. Open door to listen to aggrieved groups. Follow-through on commitments made. In addition: Communicate the mine's performance on socio-economic benefit delivery to the local community through wide distribution of the 2014 SEAT report.	1	2,8
Socio-economic	Increased traffic & consequences on road networks.	Construction and operations	3	3	3	4	3,5	0,8	2,8	Geometric and structural upgrades of selected links. Some gravel roads may require surfacing and ones affected for short periods may require a more comprehensive maintenance plan including dust suppression. Responsibility should be shared between the developers and the road owners (provincial, municipal and private).	0,8	2,24

IMPACT CATEGORY	ACTIVITY	ASPECT	POTENTIAL IMPACT	PHASE	INTENSITY	DURATION	CONSEQUENCE	EXTENT	SEVERITY	PROBABILITY	SIGNIFICANCE WITHOUT MITIGATION	MITIGATION	MITIGATION CONFIDENCE	SIGNIFICANCE WITH MITIGATION
Soil	Removal of infrastructure	Runoff from disturbed areas	Soil erosion	Decommissioning and closure	4	3	3,5	3	3,25	0,8	2,6	Appropriate sloping of areas to reflect natural landscape. Monitor site after closure and decommissioning for erosion problems	0,6	1,56
Soil	Movement of vehicles	Soil compaction	Affect soil characteristics and fertility/	Decommissioning and closure	3	3	3	3	3	0,6	1,8	Rip all compacted areas prior to seeding.	0,6	1,08
Soil	General waste generation	Storage and management of general waste (building rubble, domestic waste)	Litter in adjacent areas Environmental pollution	Decommissioning and closure	3	3	3	3	3	0,6	1,8	Store general waste in designated areas in marked containers. Littering must be prohibited. Construction footprint and adjacent areas must be inspected regularly to detect and clean up any litter. Dispose general waste at a licenced facility.	0,6	1,08
Soil	Hazardous waste generation	Storage and management of hazardous waste (contaminated rags and PPE, used oil)	Environmental pollution	Decommissioning and closure	4	3	3,5	3	3,25	0,6	1,95	Store hazardous waste in designated areas in marked containers with containment in place. Any spillages must be cleaned up appropriately. Dispose hazardous waste at a licenced facility	0,6	1,17
Biodiversity - Flora and flora	Decommissioning of infrastructure	Earth works - edge effects	Impact on habitat	Decommissioning and closure	3	3	3	3	3	0,8	2,4	Clearly demarcate area for decommissioning Rehabilitate footprint with indigenous floral species. Implement follow up and monitoring to ensure sustained vegetation growth.	0,8	1,92
Surface Water Resources	Decommissioning / removal of surface infrastructure	*Compacted soils, latent impacts of vegetation losses; and *Altered flow and runoff patterns leading to loss of recharge and potential permanent loss of catchment yield.	*Increased runoff volumes and formation of preferential surface flow paths as a result of compacted soils and unvegetated areas, leading to increased sedimentation, erosion, and increased water inputs to downgradient CWs; *Proliferation of alien vegetation due to disturbances; *Potential indiscriminate disposal of rubble and other solid waste materials within CWs, affecting surface water movement, timing and recharge of CWs, and potentially resulting in loss of floral and faunal habitat and ecoservice provision.	Decommissioning and closure	4	3	3,5	3	3,25	0,8	2,6	*Pollution prevention through infrastructure design, in order to prevent, eliminate and/or control potential pollution of soils, groundwater and surface water should be implemented; and *Implement a monitoring programme to detect and prevent the pollution of soils, surface water and groundwater. Restrict any movement in undisturbed cryptic wetlands during decommissioning.	0,6	1,56
Land use	Closure and rehabilitation of facility.	Return site to reflect baseline environment.	Restoration of ecosystems Return land to predevelopment state.	Decommissioning and closure	3	5	4	3	3,5	1	3,5	Implement rehabilitation plan upon decommissioning.	1	3,5
Visual	Closure and rehabilitation of facility.	Return site to reflect baseline environment.	Improved visual appearance	Decommissioning and closure	4	5	4,5	3	3,75	1	3,75	Implement rehabilitation plan upon decommissioning.	1	3,75
Light	Closure and rehabilitation of facility.	Return site to reflect baseline environment.	Reduction in light pollution as a result of glare and sky glow	Decommissioning and closure	3	5	4	3	3,5	1	3,5	Implement rehabilitation plan upon decommissioning.	1	3,5
Socio-economic	Decommissioning	Non-continuation of facility	Job losses	Decommissioning and closure	5	3	4	3	3,5	1	3,5	Engage with employees timeously prior to closure. Investigate the reallocation of resources. Implement measures stipulated in SLP.	0,8	2,8