

Final Basic Assessment Report and Environmental Management Programme for a Cable Repair Yard and Pre-Assembly Yard to be located at Anglo American Platinum, Rustenburg Platinum Mines, Mogalakwena Complex, Limpopo Province

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Report Prepared for

**Anglo American Platinum Limited –
Mogalakwena Complex**



Report Prepared by



December 2022

Final Basic Assessment Report and Environmental Management Programme for a Cable Repair Yard and Pre-Assembly Yard to be located at Anglo American Platinum, Rustenburg Platinum Mines, Mogalakwena Complex, Limpopo Province

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Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Anglo American Platinum Mogalakwena Complex (AAP). The opinions in this Report are provided in response to a specific request from AAP to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

FINAL

BASIC ASSESSMENT REPORT

AND

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: Anglo American Platinum, Rustenburg Platinum Mines (RPM) Limited (AAP) – Mogalakwena Complex

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IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or Mining Right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the basic assessment process is to, through a consultative process—

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focussed on determining the geophysical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within the sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine:
 - (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources, and
 - (cc) can be managed, avoided or mitigated;
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to-
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to manage, avoid or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

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List of Abbreviations

AAP	Anglo American Platinum
AASW3	Anglo-American Social Way Version 3
AMSL	Above mean sea level
AoI	Area of Influence
BA	Basic Assessment
CBA	Critical Biodiversity Area
CPI	Consumer Price Index
DEA	Department of Environmental Affairs
DFFE	Department of Forestry, Fisheries and the Environment
DFO	Dust Fallout
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
EI	Ecological Importance
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ES	Ecological Sensitivity
ESA	Ecological Support Areas
ESS	Earth Science Solutions
FDRCP	Final Decommissioning, Rehabilitation and Closure Plan
FEPA	Freshwater Ecosystem Priority Area
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IFC	International Finance Corporation
IRP	Identified Resource Protection
IT	Information technology
LEDET	Limpopo Department of Economic Development Environment and Tourism
LoM	Life of Mine
MAMSL	Metres above mean sea level
M3C	Mogalakwena 3rd Concentrator
MLM	Mogalakwena Local Municipality
MNC	Mogalakwena North Concentrator
MSC	Mogalakwena South Concentrator

MSDS	Material Safety Data Sheets
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002) (as amended)
NAAQS	National Ambient Air Quality Standards
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act (Act 107 of 1998) (as amended)
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act, 1999 (Act 25 of 1999)
NWA	National Water Act, 1998 (Act No 36 of 1998)
PAIA	The Promotion of Access to Information Act (Act 2 of 2000)
PCLU	Post Closure Land Use
PGM	Platinum Group Metal
POPIA	Protection of Personal Information(Act 4 of 2013)
PPL	Potgietersrus Platinum Limited
PSSA	Palaeontological Society of South Africa
RDL	Red Data Listed
RPM	Rustenburg Platinum Mines
RWD	Return Water Dam
SAIIAE	South African Inventory of Inland Aquatic Ecosystems
SAS	Scientific Aquatic Services CC
SASS	Stream Assessment Scoring System
SCC	Species of Conservation Concern
SDF	Standard Design Flood
SHE	Safety, Health and Environmental
SIA	Social Impact Assessment
SP	Social Performance
SRK	SRK Consulting (South Africa) (Pty) Ltd (SRK)
STP	Sewage Treatment Plant
SubWMA	Sub-water Management Area
SWMS	Social Way Management System
SWSA	Strategic Water Source Area for Surface water
TA	Traditional Authority
TOPS	Threatened or Protected Species
TSF	Tailings Storage Facility
VLGOD	Very Low-Grade Ore Dump

VU	Vulnerable
WMA	Water Management Area
WRD	Waste Rock Dump
WUL	Water Use Licence

Units of measurement

%	Percentage
dBA	Decibels
Ha	Hectare
Km	Kilometre
Km ²	Square kilometres
L	Litre
l/s	Liter/second
M	Meter
m ³	Cubic meter
mm	Milimeter

Part A: Scope of assessment and Basic Assessment Report

1 Introduction, Background and Scope of the Basic Assessment

Mogalakwena Complex is a wholly owned subsidiary of Anglo American Platinum (AAP), Rustenburg Platinum Mines (RPM) Limited and was originally called the Potgietersrus Platinum Mine; however, in March 2008 the name was changed to Mogalakwena Platinum Mine and in 2010 became Anglo American Platinum Limited Mogalakwena Mine. The mine is now officially referred to as AAP, Rustenburg Platinum Mines (RPM), Mogalakwena Complex. The Mogalakwena Complex is located approximately 30 km north-west of the town of Mokopane (formerly Potgietersrus) within the Mogalakwena Local Municipality, which forms part of the greater Waterberg District Municipality of the Limpopo Province.

Mogalakwena Complex's mining right falls on the following farms:

- Portion 0 of the farm Drenthe 778 LR;
- Portion 0 Remaining Extent of the farm Gillimberg 861 LR (Previously Witrivier 777 LR);
- Portion 0 of the farm Overysel 815 LR;
- Portion 0 of the farm Zwartfontein 818 LR;
- Portion 0, Remaining Extent of the farm Blinkwater 820 LR;
- Portion 0 of the farm Sandsloot 236 KR;
- Portion 0 of the farm Vaalkop 819 LR;
- Portion 0 of the farm Knapdaar 234 KR;
- Portion 1, 2 Remaining Extent and 3 of the farm Tweefontein 238 KR; and
- Portion 0 of the farm Rietfontein 240 KR.

Mogalakwena Complex is proposing the development of a cable repair yard (hereafter known as the cable yard) to support their current mining operations and a pre-assembly yard to support the planned development of the Mogalakwena 3rd Concentrator (M3C). A brief description of the two projects is provided in Table 1-1.

Table 1-1: Summarised description of the proposed cable yard and pre-assembly yard projects

Project	Cable yard	Pre-assembly yard
Purpose	At present, the Mogalakwena Complex has a cable yard which is located in close proximity to the Central Pit. The Mogalakwena Complex is proposing to develop a new cable yard for the repair and maintenance of cables required for primary equipment across the mine area	In 2020, Mogalakwena Complex received environmental authorisation for the Third Concentrator (M3C) and associated water management infrastructure and contractors laydown area. Subsequent to the authorisation, Mogalakwena Complex determined that the contractors laydown area will not be sufficient for the proposed M3C pre-assembly activities and that an additional area is required
Location	Within the Mogalakwena Mining Right area on the farm Zwartfontein 818 LR	Within the Mogalakwena Mining Right area on the farm Vaalkop 819 LR

Project	Cable yard	Pre-assembly yard
Supporting infrastructure¹	<ul style="list-style-type: none"> • Workshop building • Concrete laydown area • Conservancy tank • Parking areas • Waste collection area • Fencing and utilities • Infrastructure such as roads, electricity and water 	<ul style="list-style-type: none"> • Temporary/containerized buildings • Portable toilets • Installation of temporary water tanks • Reticulation of power and information technology (IT) networks • Perimeter fence • Establishment of parking areas • Internal roads within the pre-assembly yard footprint.

It is anticipated that both projects will require the cumulative clearance of more than 1 but less than 20 hectares of indigenous vegetation for the location of these facilities and related infrastructure, and therefore a Basic Assessment (BA) process needs to be undertaken in terms of the National Environmental Management Act (Act 108 of 1998) (NEMA). The application for authorisation was submitted to the Limpopo Province's DMRE for consideration on 3 August 2022 and acceptance thereof was received on 3 October 2022 (Appendix H). On 28 October 2022, SRK applied to the DMRE for an extension (50 days) to the BA timeframe in order to ensure that adequate time was provided to Interested and Affected Parties (I&APs) to comment on the Draft BA and Environmental Management Programme (EMPr). The DMRE granted the 50-day extension on 31 October 2022 (Appendix H) implying that the Final Basic Assessment report (this report) should be submitted to the DMRE on or before 15 December 2022.

This BA/EMPr has been compiled in terms of the provisions of Appendix 1,4 and 5 of the NEMA Environmental Impact Assessment (EIA) Regulations of 2014, as amended (GNR 982), as well as the requirements of the BA/EMPr template issued by the DMRE. A summary of the requirements of a BA/EMPr report including cross-references to sections in this report where these requirements have been addressed is provided in Table 1-2 for the BA, Table 1-3 for the closure aspects, and Table 26-1 for the EMPr.

This report is titled Final Basic Assessment Report and Environmental Management Programme (Final BA/EMPr) and fulfils the requirements for an BA/EMPr as contemplated in the NEMA 2014 EIA Regulations, as amended. AAP appointed SRK Consulting (South Africa) (Pty) Ltd (SRK) as an independent Environmental Assessment Practitioner (EAP) to undertake the BA and associated public participation.

¹ The required supporting infrastructure footprints, dimensions and locations are all below the thresholds triggering listing activities in terms of NEMA and section 21 activities in terms of NWA.

Table 1-2: Structure of the BA reporting in terms of Legislation Requirements as detailed in Appendix 1 (contents of an BA report) of GNR 982

Appendix 1	Legislated requirements as per the NEMA GNR 982 in Appendix 1	Relevant Report Section
(1)(a)	details of-	
	(i) the EAP who prepared the report	2.1
	(ii) the expertise of the EAP, including a curriculum vitae;	2.2 (Appendix A)
(1)(b)	The location of the activity including:	
	(i) The 21-digit Surveyor General code of each cadastral land parcel;	3
	(ii) where available, the physical address and farm name;	3
	(iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	N/A
(1)(c)	a plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale, or, if it is -	1
	(i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	(ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/A
(1)(d)	A description of the scope of the proposed activity, including	
	(i) all listed and specified activities triggered and being applied for; and	5.1
	(ii) a description of the activities to be undertaken including associated structures and infrastructure;	5.2
(1)(e)	A description of the policy and legislation context within which the development is proposed including-	6
	(i) An identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and	6
	(ii) How the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks and instruments;	6
(1)(f)	A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred development location;	7
(1)(g)	A motivation for the preferred site, activity and technology alternative;	8
(1)(h)	A full description of the process followed to reach the proposed preferred alternative within the site, including:	
	(i) details of all the alternatives considered	8
	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	9
	(iii) a summary of the issues raised by interested and affected parties (I&APs), and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	9

Appendix 1	Legislated requirements as per the NEMA GNR 982 in Appendix 1	Relevant Report Section
	(iv) the environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	10
	(v) the impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts including the degree to which these impacts – (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated	11
	(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of the potential environmental impacts and risks associated with the alternatives;	11.3
	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	11.4
	(viii) the possible mitigation measures that could be applied and the level of residual risk	11.3 and 12
	(ix) the outcome of the site selection matrix	N/A
	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	8 and 13
	(xi) a concluding statement indicating the preferred alternatives including the preferred location of an activity.	8 and 14
(1)(i)	A full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity including -	11.3
	(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process, and	11.3
	(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.	11.3
(1)(j)	An assessment of each identified potentially significant impact and risk, including -	11
	(i) cumulative impacts	
	(ii) the nature, significance and consequences of the impact and risk	
	(iii) the extent and duration of the impact and risk	
	(iv) the probability of the impact and risk occurring	
	(v) the degree to which the impact and risk can be reversed	
	(vi) the degree to which the impact and risk may cause irreplaceable loss of resources	
(1)(k)	Where applicable, a summary of the findings and recommendations of any specialist report complying with Appendix 6 to these Regulations	16.1

Appendix 1	Legislated requirements as per the NEMA GNR 982 in Appendix 1	Relevant Report Section
	and an indication as to how these findings and recommendations have been included in the final report.	
(1)(l)	An environmental impact statement which contains-	17
	(i) a summary of the key findings of the environmental impact assessment	17.1
	(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred development footprint on the approved site as contemplated in the accepted scoping report indicating any areas that should be avoided including buffers and	Appendix F
	(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.	17.3
(1)(m)	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr	11.3 and 19
(1)(n)	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	19
(1)(o)	A description of any assumptions, uncertainties and gaps in the knowledge which relate to the assessment and mitigation measures provided.	20
(1)(p)	A reasoned opinion as to whether the proposed activity should or should not be authorized and if the opinion is that it should be authorized, any conditions that should be made in respect of that authorisation	21
(1)(q)	Where the proposed activity does not include operational aspects, the period for which the environmental authorization is required and the date on which the activity will be conducted, and the post construction monitoring requirements finalized.	
(1)(r)	An undertaking under oath or affirmation by the EAP in relation to:	28
	(i) the correctness of the information provided in the reports	
	(ii) the inclusion of comments and inputs from stakeholders and I&APs	
	(iii) the inclusion of inputs and recommendations from the specialists reports where relevant and	
	(iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties	
(1)(s)	Where applicable, details of any financial provisions for the rehabilitation, closure and ongoing post decommissioning management of negative environmental impacts	23 and 26.5
(1)(t)	Any specific information that may be required by the competent authority; and	0
(1)(u)	Any other matters required in terms of section (24)(4)(a) and (b) of the Act	N/A
(2)	Where a government notice gazette by the Minister provides for any protocol or minimum information requirement to be applied to an	Noted

Appendix 1	Legislated requirements as per the NEMA GNR 982 in Appendix 1	Relevant Report Section
	environmental impact assessment report the requirements as indicated in such notice will apply.	

Table 1-3: Structure of the BA reporting in terms of Legislation Requirements as detailed in Appendix 5 (Closure Plan) of GNR 982

Appendix 5	Legislated requirements as per the NEMA GNR 982 in Appendix 5	Relevant Report Section
	details of-	
(1)(a)	(i) the EAP who prepared the report	2.1
	(ii) the expertise of the EAP;	2.2
(1)(b)	closure objectives	26.5.1
(1)(c)	proposed mechanisms for monitoring compliance with and performance assessment against the closure plan and reporting thereon;	27
(1)(d)	measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity and associated closure to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development, including a handover report, where applicable;	26.5.3
(1)(e)	information on any proposed avoidance, management and mitigation measures that will be taken to address the environmental impacts resulting from the undertaking of the closure activity;	26.4
	a description of the manner in which it intends to—	
(1)(f)	(i) modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation during closure;	26.5.1
	(ii) remedy the cause of pollution or degradation and migration of pollutants during closure;	26.5.1
	(iii) comply with any prescribed environmental management standards or practices; and	26.5.1
	(iv) comply with any applicable provisions of the Act regarding closure;	26.5.1
(1)(g)	time periods within which the measures contemplated in the closure plan must be implemented;	27.4
(1)(h)	the process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of closure;	27.5
	details of all public participation processes conducted in terms of regulation 41 of the Regulations, including—	9
(1)(i)	(i) copies of any representations and comments received from registered interested and affected parties;	
	(ii) a summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments;	

Appendix 5	Legislated requirements as per the NEMA GNR 982 in Appendix 5	Relevant Report Section
	(iii) the minutes of any meetings held by the EAP with interested and affected parties and other role players which record the views of the participants; (iv) where applicable, an indication of the amendments made to the plan as a result of public participation processes conducted in terms of regulation 41 of these Regulations	
(1)(j)	where applicable, details of any financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts.	26.5 and Appendix I

2 Details of the project applicant and environmental assessment practitioner

SRK Consulting were appointed by Mogalakwena Complex as the EAP to manage and facilitate the BA and associated public participation process in accordance with NEMA. Below are the details of the EAP, Mogalakwena Complex contact person, specialist, provincial authorities, municipal and ward contacts.

2.1 Details of EAP who prepared the report

The EAPs involved in the compilation of this Final BA/EMPr and their contact details are provided in Table 2-1.

Table 2-1: EAP contact details

Name	Contact Number	Fax Number	Email Address
Ashleigh Maritz	011 441 1154	086 503 1222	amaritz@srk.co.za
Michelle Miles	011 441 1111	086 503 1222	mmiles@srk.co.za

2.2 Expertise of the EAP

The section below provides the qualifications of the EAP, summary of EAP project experience and Mogalakwena contact details.

2.2.1 Qualifications of the EAP

The qualifications of the EAPs are provided for in Table 2-2 and copies of the qualifications are provided in Appendix A.

Table 2-2: EAP Qualifications

Name	Qualifications	Professional registration	Years' Experience
Ashleigh Maritz	MSc. (Biochemistry), BSc Hons (Biochemistry) and BSc (Natural and Environmental Science)	PrSciNat (400331/11) Reg. EAP (2020/547)	16
Michelle Miles	B.Sc. Hons (Environmental Water Management)	Reg. EAP (2020/1057)	6

2.2.2 Summary of EAPs past experience

The EAPs' expertise is provided for in Table 2-3. Detailed curricula vitae of the project team are provided in Appendix A.

Table 2-3: EAP expertise

EAP Name	Expertise
Ashleigh Maritz	<p>Ashleigh has 16 years' experience in the field of environmental science and management and is a Principal Environmental Scientist at SRK Consulting. Her expertise includes:</p> <ul style="list-style-type: none"> • Project management of environmental and social impact assessments (within South Africa and Africa), • Environmental impact assessment • Environmental management programmes • Environmental Auditing and due diligence/technical reviews.

EAP Name	Expertise
Michelle Miles	Michelle has 6 years' experience within the environmental science and management field. She has been involved in various aspects of projects ranging from concept studies all the way through to environmental construction management. Her expertise includes: <ul style="list-style-type: none"> • General environmental management • Environmental impact assessments • Environmental management programmes • Stakeholder consultation

2.3 Mogalakwena Complex details

The physical and postal address of Mogalakwena Complex is provided in Table 2-4 and details of the responsible persons at Mogalakwena Complex are presented in Table 2-5

Table 2-4: Physical and postal address for Mogalakwena Complex

Address	Details
Physical address:	Sandsloot Farm, N11 Groblers Bridge Road, Mokopane
Postal address:	Anglo American Platinum Ltd, Mogalakwena Complex, Private Bag X2463, Mokopane, 0600

Table 2-5: Mogalakwena Complex responsible persons

Name	Designation	Responsibilities
Willie Noordman	Senior General Manager (SGM)	SGM for Mogalakwena Complex
Riaan Bignaut	Executive Head: Asset Reliability SHEE	Overarching SHE activities
Mike Molefe	Safety, Health and Environment (SHE) Manager	All SHE activities at Mogalakwena Complex
Jeffrey Ngobeni	Social Performance Manager	Social performance management
Frank Pieterse	Environmental Principal	Oversight and support on Environmental management of Anglo American Platinum operations in the Eastern Limb of the Limpopo Province
Timothy Seimela	Environmental Superintendent	All environmental matters at Mogalakwena Complex

2.4 Details of specialists

The EAP has worked closely with specialists to determine the baseline conditions which will assist in identifying risks and impacts as part of other projects conducted at the Mogalakwena Complex. The EAP therefore has extensive knowledge of the site as well as what the relevant studies that are required to support the project. The specialist studies listed in Table 2-6 formed part of the project and focussed on the proposed cable yard and pre-assembly yard areas (refer to Figure 4-1) which will be impacted on by the proposed activities.

Table 2-6: Specialist studies undertaken for the proposed cable yard and pre-assembly yard areas

Specialist Study	Conducted by	Qualifications and registration
Noise	dBAcoustics Mr Barend van der Merwe	MSc Environmental Management Registrations: SAAI, NACA, IAIASA and SAIOH
Freshwater Ecosystem Assessment	Scientific Aquatic Services Ms Kim Marais	BSc (Hons) (Herpetology) Registration: SACNASP (Professional Natural Scientist)
Floral Ecology	Scientific Terrestrial Services Ms Christien Steyn	MSc Plant Science BSc (Hons) (Plant Science) BSc (environmental Science) Registrations: SACNASP, SAAB, LARSSA, GSSA and BotSoc
Heritage	PGS Heritage Mr Polke Birkholtz	BA Hons Archaeology Registration: ASAPA
Palaeontology desktop review	Banzai Environmental Ms Elize Butler	BSc Botany and Zoology BSc (Hons) Zoology MSc Zoology Registration: Palaeontological Society of South Africa (PSSA)
Rehabilitation and Closure	SRK Consulting Mr James Lake	MSc Environmental Geochemistry Registration: SACNASP (Professional Natural Scientist)

The specialists compiled their reports in accordance with the requirements stipulated in Appendix 6 of the NEMA EIA Regulations of 2014 (as amended).

Any recommendations made by the specialists have been incorporated into the Final BA/EMPr. The specialist studies are also appended to the Final BA/EMPr (Appendix E).

2.5 Provincial authorities' details

Environmental authorisation is required from the DMRE whose details are provided in Table 2-7. An application for the environmental authorisation process was submitted on 3 August 2022. The application form acknowledgement letter was received on 3 October 2022. The screening report is included in Appendix D.

Table 2-7: Competent authority details

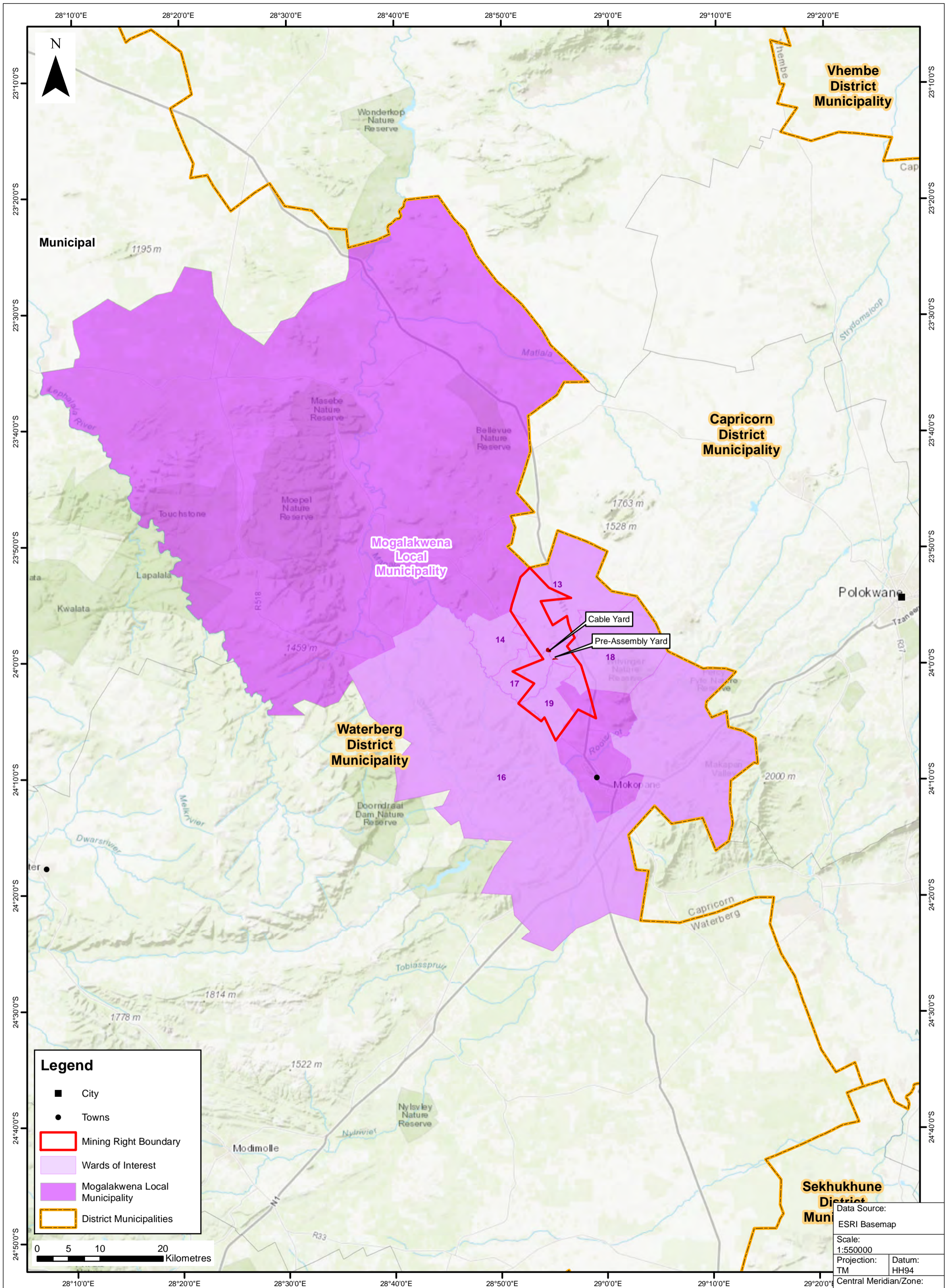
Department	Contact Person
DMRE (Polokwane Office)	Mr Nicholas Chavalala

2.6 Municipality and ward details

Mogalakwena Complex is situated within the Mogalakwena Local Municipality, which forms part of the greater Waterberg District Municipality in the Limpopo Province. Details of the relevant municipalities and wards are provided Table 2-8 and shown in Figure 2-1.

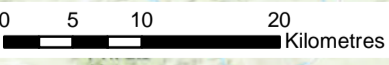
Table 2-8: Local and district municipality details

Municipality	Contact Person	Designation
Mogalakwena Local Municipality	Morris Maluleka	Acting Municipal Manager
Mogalakwena Local Municipality	Lebogang Morata	Town planning officer
Mogalakwena Local Municipality	Cllr M.J. Mampane	Ward Councilor (Ward 13)
Waterberg District Municipality	Gladwin Tloubatla	Acting Municipal Manager
Waterberg District Municipality	Kabelo Mosito	Head of Communications



Legend

- City
- Towns
- ▭ Mining Right Boundary
- ▭ Wards of Interest
- ▭ Mogalakwena Local Municipality
- ▭ District Municipalities



Data Source:	
ESRI Basemap	
Scale:	
1:550000	
Projection:	Datum:
TM	HH94
Central Meridian/Zone:	
LO 29	
Date:	Compiled by:
30/08/2022	LOUA
Project No.	Fig No.
575107	2-1
Revision:	Date:

3 Description of the property

The description of the property where the proposed cable yard and pre-assembly yard will be located is shown in Table 3-1 and Table 3-2 respectively. The property information was obtained via WinDeed (included in Appendix B).

Table 3-1: Description of the property applicable to the cable yard

Farm name	Portion 0 of the Farm Zwartfontein 818 LR
Owner²	National Government of the Republic of South Africa (RSA) (Held in Trust by the National Government of the Republic of South Africa on behalf of the Mapela Traditional Authority (TA))
Total area (ha)	1729.57 ha
Application area (ha)	Approximately 5 ha
Magisterial district	Mogalakwena Local Municipality and Waterberg District Municipality
Distance from nearest town/s	<ul style="list-style-type: none"> • 35 km in a south-south easterly direction of Mokopane • 65 km in an easterly direction of Polokwane • 108 km in a south-westerly direction of Modimolle
21-digit Surveyor General code for each farm portion	TOLR00000000081800000
Title deed	T6601/1913

Table 3-2: Description of the property applicable to the pre-assembly yard

Farm name	Portion 0 of the Farm Vaalkop 819 LR
Owner³	National Government of the Republic of South Africa (RSA) (Held in Trust by the National Government of the Republic of South Africa on behalf of the Mapela TA)
Total area (ha)	1600.997 ha
Application area (ha)	Approximately 18 ha for the pre-assembly yard
Magisterial district	Mogalakwena Local Municipality and Waterberg District Municipality
Distance from nearest town/s	<ul style="list-style-type: none"> • 35 km in a south-south easterly direction of Mokopane • 65 km in an easterly direction of Polokwane • 108 km in a south-westerly direction of Modimolle

² Land ownership has been determined using WinDeed and the property information obtained from WINDEED has been provided in Appendix B

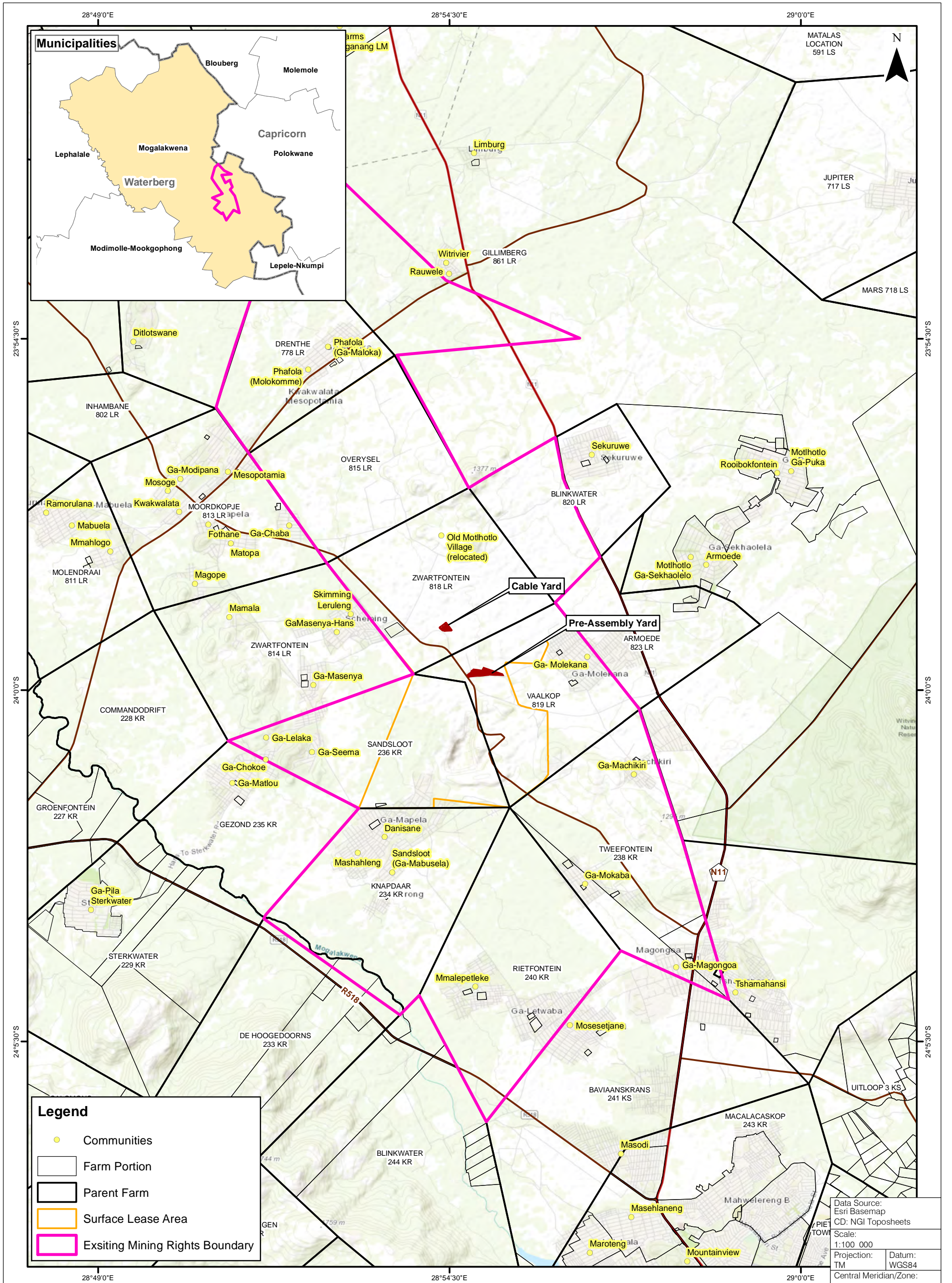
³ Land ownership has been determined using WinDeed and the property information obtained from WINDEED has been provided in Appendix B

21-digit Surveyor General code for each farm portion	TOLR0000000081900000
Title deed	T22441/1942

4 Locality of the proposed project

Mogalakwena Complex is situated approximately 30 km north-west of the town of Mokopane within the Mogalakwena Local Municipality, which forms part of the greater Waterberg District Municipality of the Limpopo Province (refer to Figure 4-1). The Mogalakwena Complex lease area covers approximately 51.05 km² and stretches approximately 8 km from east to west and approximately 13 km from north to south. To the east of Mogalakwena Complex lies the National N11 highway. This is the main access route to the mine as well as the key transport corridor between Mokopane and the South Africa-Botswana border.

The proposed footprints of the cable yard and pre-assembly yard will be located on Portion 0 of the Farm Zwartfontein 818 LR and Portion 0 of the Farm Vaalkop 819 LR respectively. Both footprints are within Mogalakwena Complex's mining right and surface lease areas (refer to Figure 4-1).



5 Description of the scope of the proposed overall activity

The Mogalakwena Complex is divided into three operational areas, namely:

- Openpit Mining;
- Mogalakwena South Concentrator (MSC); and
- Mogalakwena North Concentrator (MNC).

Table 5-1 provides a summary of the current and proposed (authorised but not yet constructed/developed) mining and process operations as well as the water and waste management systems at Mogalakwena Complex.

Table 5-1: Overview of the Mogalakwena Complex operations

Aspect	Description
Mining Operations	
Target minerals	<ul style="list-style-type: none"> • Platinum group metals (PGMs) • Base metals: copper, nickel and cobalt
Ore body	Platreef
Products	Platinum and PGM concentrate which is transported off site to the Polokwane Metallurgical Complex for smelting
Life of mine (LoM)	Operations are 365 days per year, 24 hours per day LoM extends well beyond 2080 and could continue for a further period of approximately 100 years
Mining method	<p>Mogalakwena Complex currently has five pits, namely:</p> <ul style="list-style-type: none"> • North Pit located on the farm Overysel 815 LR; • Central Pit located on the farm Zwartfontein 818; • South Pit located on the farm Zwartfontein 818; • Zwartfontein Pit situated on the farms Zwartfontein 818 LR, Vaalkop 819 LR and Sandsloot 236 KR; and • Sandsloot pit situated on the farm Sandsloot 236 KR <p>It is the intention that North, Central and South pits will in future (long term) be mined as one large pit</p> <p>Open pit mining could ultimately be supplemented by underground mining i</p>
North and South Concentrator operations	
Concentrator complex	<ul style="list-style-type: none"> • There are two mineral processing plants at the mine, MNC and MSC. An additional concentrator, known as the M3C, is planned but not yet constructed • The ore is processed by the MSC and MNC Plants. The MSC has the capacity to process 385 ktpm. The MNC plant has a capacity of 800 ktpm, and in future an additional 4.8 mtpa could be processed. Therefore, the total future potential capacity of the MNC is a 1200 ktpm • Ore is transported by haul trucks to the gyratory crusher and by means of conveyors to the mineral processing plant, as well as within the plant • Crushing is achieved in three phases using a gyratory crusher as a primary crusher in an open circuit, followed by secondary and tertiary crushing with associated screening • Conveyor feeds the primary mills from the crushed ore stockpiles • Following exposure of the PGM and base metal surfaces in the milling circuit, reagents are added to the milled product streams to prepare the minerals for flotation • Concentrate is dewatered prior to dispatch to the smelter in Polokwane via road • Currently tailings from the MNC and MSC are pumped to the Blinkwater 1 Tailings Storage Facility (TSF) as Vaalkop TSF complex (original and

Aspect	Description
	extension) has temporality been placed on care and maintenance (with the intention to start depositing on the Vaalkop TSF complex in future) <ul style="list-style-type: none"> • Tailings from the proposed M3C will be pumped to the proposed Blinkwater 1&2 TSF
Waste and residue disposal	
Waste Rock Dumps	<ul style="list-style-type: none"> • Overysel 815 LR: The Waste Rock Dumps (WRDs) include dump W02 to the west of the North pit and dump W020 to the East of the North pit. These form part of the original East and West WRD footprint areas and includes the Western bundwall dump and the Eastern bundwall dump. In addition to this the NWRD has been authorised but not developed • Zwartfontein 818 LR: WRD W01 situated to the northeast of South pit • Sandsloot 236 KR: Two WRDs are situated on this farm, namely; RS3 situated to the West of the Sandsloot pit and W07 situated to the south of Sandsloot pit. W07 also extends onto Vaalkop 819LR • Vaalkop 819 LR: WRD situated to the East of the Sandsloot pit • Gillimberg 861 LR : Witrivier WRD located on Gillimberg 861 LR (Previously Witrivier 777 LR – not developed)
Ore Stockpiles and oxidized dumps	<ul style="list-style-type: none"> • A number of low-grade ore and ore pebble stockpiles are situated at various locations on the mine • Ore stockpiles are situated in various locations on the farms Overysel 815 LR, Vaalkop 819 LR, Zwartfontein 818 LR and Sandsloot 236 KR • Ore stockpiles are dynamic dumps feeding the concentrators as required
Topsoil and subsoil dumps	Topsoil and subsoil dumps are maintained on site until they will be utilised for rehabilitation
Tailings Storage Facilities	Mogalakwena Complex operate 3 TSFs namely: <ul style="list-style-type: none"> • The Vaalkop TSF Complex (original dam compartment 1 and extension compartment 2), currently under care and maintenance, is situated on the farms Zwartfontein 818 LR and Vaalkop 819 LR and the return water stored for re-use in the RWD and RWD extension <ul style="list-style-type: none"> ○ Vaalkop TSF 1 was designed for 1 909 200 tons per annum (tpa) dry tonnes ○ Vaalkop TSF 2 was designed for 2 532 000 dry tpa • The Blinkwater 1 TSF is located on the farm Blinkwater 820 KR and was commissioned in 2011, and supernatant from the Blinkwater 1 TSF is discharged into the RWD extension <ul style="list-style-type: none"> ○ Blinkwater 1 TSF is designed for 112 472 651 m³ ○ The extended Blinkwater 2 TSF, which has not been constructed
Sewage treatment plants (STP)	<ul style="list-style-type: none"> • The mine is served by a waterborne sewage system • Three STPs currently operate on the mine, namely MSC, MNC and Contractors' Camp, and sewage is piped by gravitational flow to the various STPs • The treated sewage effluent at MSC, with a design capacity of 120 m³/day, is pumped back into the plant process water circuit • The treated sewage effluent at MNC, with a design capacity of 200 m³/day, is pumped back into the plant process water circuit and overflow/excess is pumped to the return water dam extension • The contractor's camp STP consists of a series of lined oxidation ponds and is designed to cater for a throughput of 78 m³/day. The treated sewage effluent is pumped via the main pit dewatering pipeline to Dam 1160 and is authorised in the 2020 WUL for use in dust suppression and/or reused in the process
Domestic, general and hazardous waste management	<ul style="list-style-type: none"> • Mogalakwena Complex previously operated its own general and small waste disposal site (classified as type G:S:B) (approximately 2.24 ha in size). The site is located at the MSC on the farm Vaalkop 819 LR. This waste disposal site was constructed in 1992 as part of the original infrastructure required for the mine. The site is currently closed and is undergoing planning for rehabilitation • The mine has a new salvage yard with a sorting pad under-roof for sorting of waste going for recycling and reuse opportunities • Materials such as metal, scrap, glass, paper and plastics are sent for recycling.

Aspect	Description
	<ul style="list-style-type: none"> Industrial waste that cannot be salvaged or returned to suppliers for recycling is sorted at designated salvage areas at both the MNC and MSC Concentrators before being removed off site for further treatment aligned to the AAP Zero Waste to Landfill principle and process Hazardous waste is sorted at designated salvage areas at both the MNC and MSC's before being taken t for further recycling, refining or treatment to licensed off-takers⁴ A new authorised Class B facility for waste disposal, sorting facility and treatment of contaminated waste has been developed on the farm Zwartfontein 818 LR, in the centre of the mine. However, this area is currently not developed as a landfill Zero waste to landfill was achieved in 2020 for the Complex
Waste tyre and processing site.	<ul style="list-style-type: none"> All waste tyres are taken to a licensed Waste Tyre Storage Area on WRD W07 Waste Tyres are downsized into rubber chips and metal on site and is then taken to a licensed Waste Tyre Processing Facility within the storage area as approved by the Waste Bureau
Other mine infrastructure	
Surface conveyors	Conveyors are operated and utilised at and within the mineral processing plants to transport ore for processing
Potable water supply	<ul style="list-style-type: none"> Potable water is obtained from the Commandodrift, Potgietersrus Platinum Limited (PPL) and Blinkwater wellfields The abstraction of groundwater at these wellfields has been authorised by DWS under Mogalakwena Complex's Water Use Licence (WUL) (reference number 07/A61G/ABCGIJ/9887) Additional boreholes over and above the already-approved wellfield boreholes situated on the mine site have been authorised for abstraction and potable water use under the consolidated WUL (No. 14/A61G/GICABJ/5053) Majority of the wellfield water is used for domestic purposes and only a small percentage is used in the process at MSC as a back-up supply
Process water supply	<p>Process water is obtained from:</p> <ul style="list-style-type: none"> Recycled sewage effluent from the MNC and MSC STPs and the contractors camp STP Mokopane (up to 6 Mℓ/d is authorized) and Polokwane (up to 20 Mℓ/d is authorized) municipal STPs Pit dewatering Return water from the TSFs Dirty runoff collected in stormwater dams <p>The process water dam (Dam 1160) and the RWD and extension with associated pump and pipeline systems are established as part of the combined water system for the mine.</p> <p>These water storage facilities manage the availability of water to processing activities with limited interruptions.</p>
Roads	<ul style="list-style-type: none"> Roads within the mine area consist of existing internal mine and haul roads and roadways into the open pits. Access roads are tarred. Haul roads are gravel and are sprayed with a commercial dust suppressant according to a detailed schedule.
Pipelines	<ul style="list-style-type: none"> Treated sewage effluent from Mokopane and Polokwane municipal STPs is pumped to the process water dam, Dam 1160, via a pipeline system. A pipeline system has been constructed to transfer excess water from the pits to Dam 1160 and the RWD and extension. Tailings slurry from the MNC and MSC is transported to the Blinkwater 1 TSF via pipelines.

⁴ To note waste is not disposed to landfill except, those wastes that do not have off-takes including incineration (e.g. waste such as asbestos). Waste such as these have excluded from the zero waste to landfill process.

Aspect	Description
	<ul style="list-style-type: none"> Two pipelines carry dirty water from the Blinkwater 1 TSF section to the Return Water Dam (RWD) extension and from Vaalkop Dam to the RWD. Water from the original RWD travels via pipeline to the MSC and Dam 1160 and from the RWD Extension to the MNC. Run-off water from the rock dumps, offices and workshops is collected in a WRD run off pollution control dam and then pumped via pipeline to the RWD. In addition to the above there are various internal pipelines for the transport of potable, process, tailings and sewage.
Electricity Supply	Electricity to the mine is supplied by Eskom via an electricity distribution network. Electricity is distributed to operational areas at the complex via internal electrical supply lines
Other	The mine complex and concentrator complexes include infrastructure such as change houses, stores, emulsion and explosive storage areas, offices, boardrooms, workshops, training centres, clinic, security offices, fuel/lube bays, green/conservation areas, dispatch and other supporting buildings, and clean and dirty water separation systems

5.1 Listed and specified activities

Table 5-2 below provides the NEMA related listed activities that will be triggered due to the proposed projects. The listed activities triggered by the proposed project have been indicated in Figure 5-3. This section also describes the activities to be undertaken.

Table 5-2: Listed activities triggered for the proposed project

NAME OF ACTIVITY (E.g. For prospecting - drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access route etc...etc...etc E.g. for mining,- excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (<i>GNR 983, GNR 984 or GNR 985</i>)/ NOT LISTED	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Establishment of a cable yard to repair and connect cable for the southern area of the Mogalakwena Complex	Approximately 5 ha	X	GNR 983, Activity 27	N/A
Establishment of an area to pre-assemble equipment and machinery which will be installed at the M3C	Approximately 18 ha	X	GNR 983, Activity 27	N/A

5.2 Description of the activities to be undertaken

Both the cable yard and pre-assembly yard projects are simple in nature and will take place within previously disturbed footprints at Mogalakwena Complex. The sections below provide further details of each project as well as its support infrastructure.

5.2.1 Cable Yard description

At present, the Mogalakwena Complex has a cable yard which is located in close proximity to the Central Pit however requires decommissioning as it is situated within the 500m blast zone in terms of future mine plans. The Mogalakwena Complex is proposing to develop a new cable yard which will be

situated within the existing Mogalakwena Complex mining right and lease areas to the north east of Zwartfontein pit on the Farm Zwartfontein 818 LR (Figure 5-1). The proposed cable repair yard will be used for the repair and maintenance of cables required for primary equipment across the mine area. The area will need to be cleared of more than 1ha (but less than 20ha) of indigenous vegetation to make way for the cable yard as well as associated infrastructure.

Infrastructure and activities associated with the cable yard include:

Table 5-3: Cable yard key infrastructure and activities

Key infrastructure	Components
Offices	Cable bay Site Manager Office
	Overhead Line Site Manager Office
	Electrical Foreman Office
	PMA office
	Green Area
	Ablution facilities
	Chemical Store
	Storage facilities
Infrastructure	Access road to the cable yard from the haul road – The road will have an approximate width of 7.4 meters (m) and a total length of 452m
	Fence Yard with clearview fence (2400 m ²)
	Electrical Fence
	Roof structure (400m ²)
	Concrete slab to handle the Cable Reeler carrying a fully loaded cable drum (400m ²)
	Paving works for walkways
	Electricity supply to the facility from the existing 11kV/33kV lines and from solar panels which will be installed on top of the roof of the workshop
	Water for the facility – to be supplied by: <ul style="list-style-type: none"> • 90mm diameter uPVC Pipe Class 12 – 88m total length • 110mm diameter uPVC Pipe Class 12 – 110m total length <p>General water flow is anticipated to be 0.090 liters per second (l/s) and fire water flow is anticipated to be 25 l/s. Therefore total water flow to the cable yard facility will be approximately 25 l/s</p>
	Concrete slab for waste skips

	Cage for waste
	Assembly point facility
	Vehicle parking bay for 8 vehicles
	HME parking bay for 2 HMEs
	TLB parking bay
	Above-ground conservancy tank with installed pipework to this facility (90mm diameter uPVC Pipe Class 12 – 88m in length) with a total design flow of 0.065l/s. The tank has been designed to have a 72 hour capacity to accommodate sewage after which it will be emptied. The sewage will be taken for treatment at an existing and authorised STP at Mogalakwena Complex every three days at a maximum
Equipment required	Trailing cable stands = X10
	High pressure hosing system to clean the workshop floor = X2
Waste management	The cable yard is not expected to create large amounts of waste. A suitable waste handling/storage facility will be established with dedicated skips for the appropriate separation of waste. The waste generated at the site will be placed in these skips which will be managed and removed by the designated contractor on site for waste removal and recycling on a regular basis in line with Mogalakwena Complex's existing Waste Management Procedure
Storage of dangerous goods	Certain lubricants for maintenance purposes (grease, oils) or paints accompanying the equipment as first fills or touch-up paint will be stored at the yard in small quantities (in drums or tins) and will be stored in the appropriate storage cages and within bunded areas where appropriate and in line with product specific Material Safety Data Sheets (MSDS)

5.2.2 Pre-Assembly Yard description

In 2020, Mogalakwena Complex received environmental authorisation for the M3C and associated water management infrastructure and contractors laydown area. Subsequent to the authorisation, Mogalakwena Complex determined that the contractors laydown area will not be sufficient for the proposed M3C pre-assembly activities and that an additional area is required. The proposed pre-assembly yard (Figure 5-2) will be located within the existing Mogalakwena Complex mining right and lease areas to the south of the existing return water dam at the Vaalkop tailings dam on the Farm Vaalkop 819 LR. The area will predominately be used for three purposes described in more detail in Table 5-4.

Table 5-4: Key components of the pre-assembly yard

Key infrastructure	Components
Temporary Construction facilities	<ul style="list-style-type: none"> • Establishment of concrete hardstand areas for placement and assemblage of M3C components • Placement of temporary/containerized buildings (kwikspace or similar) including offices, messing facilities, ablutions, document & data storage, under roof equipment and materials storage • Installation of temporary water tanks for the provision of drinking water and to service the ablutions • Installation of temporary portable toilets within the ablutions facilities • Reticulation of power and IT networks between the above areas/containerized offices and in the installation of area lighting where required • Construction of a perimeter fence (approximately 2300m) on the boundary of the area including access gates and turnstiles as well as the construction of limited fencing inside the boundary to allow more secure storage of materials and to demarcate areas between different contractors • Establishment of parking areas • Establishment of internal road network within the proposed pre-assembly yard footprint
Laydown and storage of equipment and materials	<ul style="list-style-type: none"> • Establishment of level open areas in order to place and temporarily store equipment earmarked for the construction of M3C. Equipment will be placed/stored on pallets, other appropriate dunnage or crates • Establishment of level open areas in order to place and temporarily store materials for the construction of M3C. Materials, such as piping, structural steel, plate work, cable drums, valves, etc. will be stored on appropriate dunnage or in crates • Establishment of material stores (temporary covered areas or buildings) to store sensitive materials earmarked for the construction of M3C. Materials such as electrical panels or components, instrumentation, valves, etc. will be stored in these buildings/containers
Pre-assembly of structures	<p>Select structures on the M3C plant will be pre-assembled in the yard by a designated contractor. This contractor will assemble these structures on open level areas using temporary/movable concrete and steel supports. Once assembled these structures (such as conveyor gantries or pipe rack gantries) will be loaded onto the appropriate transport vehicles and moved to site for installation</p>
Water and sewage	<p>There will be no connection to an existing potable water supply or a tie-in to existing sewage reticulation system as none such services are available in close proximity to the pre-assembly yard. Potable water will be brought to the pre-assembly yard in bowsers and stored on site in temporary tanks (Jo-Jo tanks or similar). The water source will be the potable water supply at the MNC facility. These tanks will be located in close proximity to the point of use (i.e. close to the ablutions or close to the mess facilities) in order to limit distribution piping (if any). Portable toilets will be used and these will be emptied by the designated contractor on site for waste removal on a regular basis</p>
Waste management	<p>The pre-assembly yard is not expected to create large amounts of waste as there's no large-scale fabrication or other processing activities taking place on the site. Hence, only domestic waste (from the offices and associated messing facilities) and limited industrial waste (from the storage of materials and pre-assembly work) is expected. A suitable waste handling/storage facility will be established with dedicated skips for the appropriate separation of waste. The waste generated at the site will be placed in these skips which will be managed and removed by the designated contractor on site for waste removal and recycling on a regular basis</p>

Surface water run-off	As there is no large-scale fabrication or other processing activities taking place on the site there will be no dedicated installation in place to capture surface water run-off to store or treat contaminated water as no such contaminants are expected in this area. Any localised environmental contaminants such as an oil leaks from a vehicle or crane and runoff from cement preparation/mixing areas will be dealt with immediately and cleaned up at the point of spill
Storage of dangerous goods	No large scale or permanent storage of dangerous goods are earmarked for the pre-assembly yard. Diesel will be stored in limited quantities only for use by the vehicles, cranes or generators to be used at the pre-assembly yard. This diesel will be stored in mobile bowsers (trailer mounted) hence in limited quantities. Certain lubricants (grease, oils) or paints accompanying the equipment as first fills or touch-up paint will also be temporarily stored at the yard up until the associated equipment is installed at site. These lubricants and paint will be provided in small quantities (in drums or tins) and will be stored in the appropriate storage cages



Legend

- Farm Portion
- Parent Farm
- Surface Lease Area
- Mining Right Boundary
- ~ ~ ~ River

Data Source:	
Esri Basemap	
Scale: 1:2 500	
Projection: TM	Datum: WGS84
Central Meridian/Zone: 29	
Date: 24/01/2022	Compiled by: LOUA
Project No: 575107	Fig No: 5-1
Revision: A Date: 31 08 2022	



MOGALAKWENA COMPLEX
PROPOSED CABLE YARD

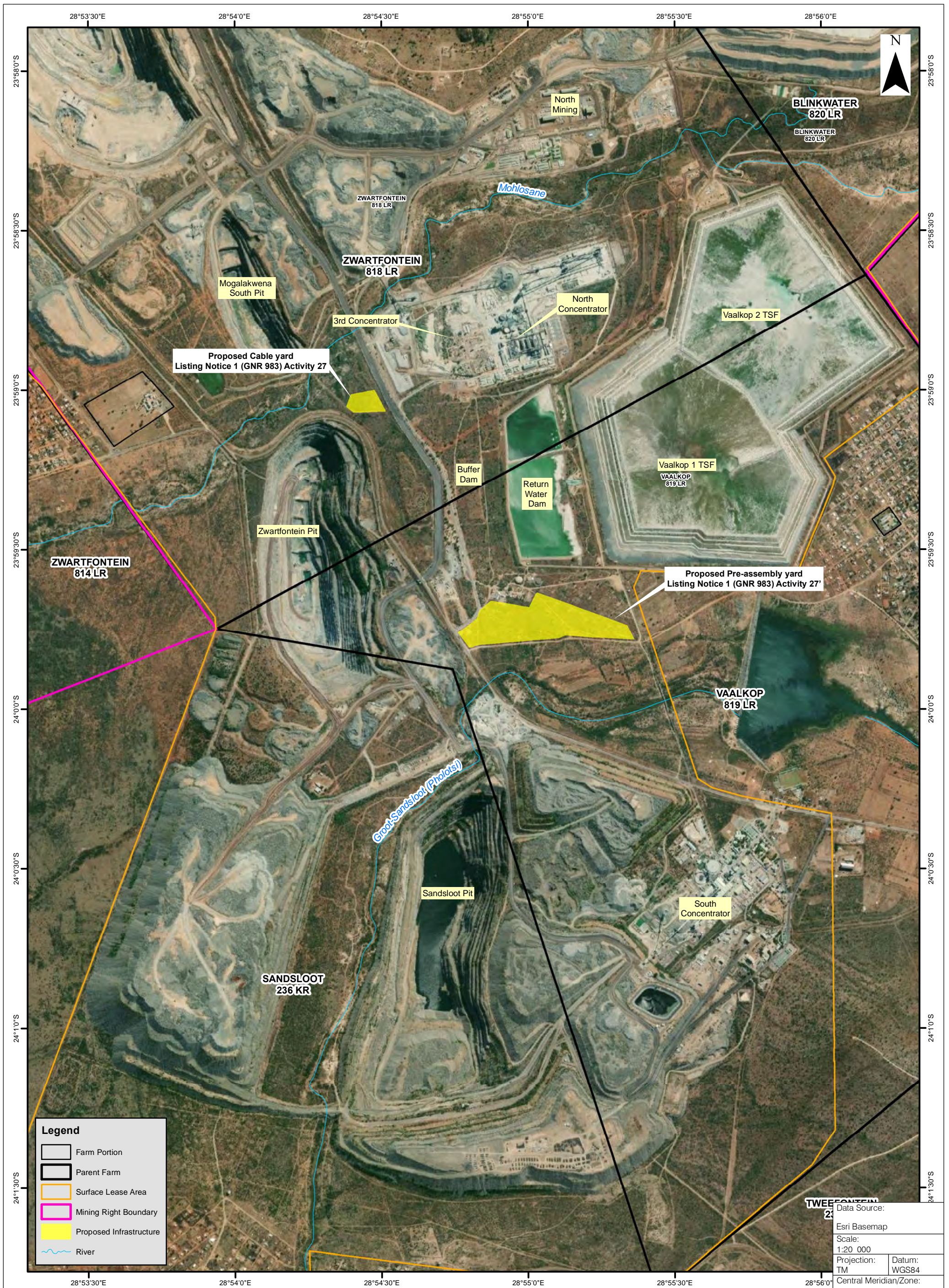


Legend

- Proposed Pre-Assembly Yard
- Existing Powerline
- Existing AAP 11kV Line
- AAP 33kV Line
- Farm Portion
- Parent Farm
- Surface Lease Area
- Mining Right Boundary
- River



Data Source:	
Esri Basemap	
Scale: 1:5 000	
Projection:	Datum: WGS84
Central Meridian/Zone:	
Date:	Compiled by:
24/01/2022	LOUA
Project No:	Fig No:
575107	5-2
Revision: A Date: 31 08 2022	



Legend

- Farm Portion
- Parent Farm
- Surface Lease Area
- Mining Right Boundary
- Proposed Infrastructure
- River

Data Source:	
Esri Basemap	
Scale: 1:20 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: 29	
Date: 31/08/2022	Compiled by: LOUA
Project No. 575107	Fig No. 5-3
Revision:	Date:

6 Policy and Legislative Context

This section provides an overview of the policy and legislative context within which the project will operate. It identifies all legislation, policies, plans, guidelines and other applicable legislation to this activity to be considered in the assessment process, which may be applicable or have relevance to the project. This sections also describes Anglo American policies and guidelines.

6.1 The Constitution of South Africa, 1996 (Act No. 108 of 1996)

The Bill of Rights is the cornerstone of democracy in South Africa, ensuring the rights of all people and affirming the democratic values of human dignity, equality and freedom. Section 24 is directly relevant to environmental law and states that everyone has the right to:

“An environment that is not harmful to their health or well-being; and have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that: Prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.

The Constitution of South Africa is the overarching framework legalisation driving the NEMA principles. The right to a safe environment and the right to information are addressed during the environmental authorisation process through stakeholder engagement, where available information pertaining to the environment and proposed activities are disclosed.

6.2 The Promotion of Access to Information Act, 2000(Act No. 2 of 2000)

The Promotion of Access to Information Act (“PAIA”) gives effect to the Constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights, and to provide for matters connected therewith. In addition to providing access to information, cognisance should be taken that PAIA also makes provision for the refusal of access to information that is deemed to be of a sensitive, confidential or classified nature. Without access to information, a person may be unable to determine whether or not his or her right to just administrative action (or to an environment not harmful to human health or wellbeing or, for that matter, any other Constitutional right) has been infringed.

6.2.1 Protection of Personal Information, 2013 (Act No. 4 of 2013)

The Protection of Personal Information Act 4 of 2013 (POPIA), which aims to promote protection of personal information, came into effect on 1 July 2021. The EIA Regulations, 2014 require, inter alia, transparent disclosure of registered stakeholders and their comments. In terms of the EIA Regulations, 2014, stakeholders who submit comment, attend a meeting or request registration in writing are deemed registered stakeholders who must be added to the project stakeholder database. By registering, stakeholders are deemed to give their consent for relevant information (including contact details) to be processed and disclosed, in fulfilment of the requirements of the EIA Regulations, 2014 and the National Appeal Regulations, 2014.⁵

⁵ All personal information contained in this report will not be shared publicly and will only be distributed to the DMRE and the AAP Project team.

6.3 Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)

The MPRDA makes provision for equitable access to and sustainable development of South Africa's mineral resources. The MPRDA requires that the environmental management principles set out in NEMA shall apply to all mining operations and serves as a guideline for the interpretation, administration and implementation of the environmental requirements of NEMA.

The MPRDA requires that a reconnaissance permission, prospecting right, Mining Right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right, production right, prospecting work programme; exploration work programme, production work programme, mining work programme, environmental management programme, or an environmental authorization issued in terms of the National Environmental Management Act, 1998, as the case may be, may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or a share or shares or seams, mineralized bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister.

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

The all-encompassing principle of the National Environmental Management Act 1998 (Act 107 of 1998) ("NEMA") is sustainable development. It defines sustainability as meaning the integration of social, economic and environmental factors into planning, implementation and decision making so as to ensure the development serves present and future generations.

Section 24 of the NEMA, headed "Environmental Authorisations" sets out the provisions which are to give effect to the general objectives of Integrated Environmental Management ("IEM"), and laid down in Chapter 5 of the NEMA. In terms of section 24(1), the potential impact on the environment of listed activities must be considered, investigated, assessed and reported on to the competent authority charged by the NEMA with granting of the relevant environmental authorisation.

On 04 December 2014, the Department of Environmental Affairs ("DEA") published the 2014 NEMA Environmental Impact Assessment ("EIA") Regulations and listed activities in Government Gazette No. 38282, which was amended in 2017.

The proposed infrastructure involves listed activities detailed in Section 5.1 as identified in terms of the NEMA read with the Environmental Impact Assessment Regulations of 2014. In terms of section 24(2) and 24D of the NEMA no person may commence an activity listed or specified in terms of the act unless the competent authority has granted an environmental authorisation for the activity.

6.5 National Water Act, 1998 (Act No. 36 of 1998) (NWA)

The NWA promotes the protection, use, development, conservation, management, and control of water resources in a sustainable and equitable manner. Chapter 4 of the National Water Act stipulates that water uses (abstraction, storage, waste disposal, discharge, removal of underground water and alteration to watercourses) must be licensed.

6.6 The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

The National Heritage Resources Act aims to promote good management of cultural heritage resources and encourages the nurturing and conservation of cultural legacy so that it may be bestowed to future generations.

Section 38 of the NHRA details how heritage resources must be managed and provide development categories which include the requirement that all developers, including mines, must undertake cultural

heritage studies for any development exceeding 0.5 ha. It also provides guidelines for impact assessment studies to be undertaken where cultural resources may be disturbed by development activities.

6.7 The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA)

NEM:BA provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.

6.8 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM:AQA)

The main objectives of NEM:AQA are to protect the environment by providing reasonable legislative and other measures to:

- Prevent air pollution and ecological degradation;
- Promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development in alignment with Sections 24a and 24b of the Constitution of the Republic of South Africa.

The Act has devolved the responsibility for air quality management from the national sphere of government to local spheres of government (district and local municipal authorities), who are tasked with baseline characterisation, management and operation of ambient monitoring networks, licensing of listed activities, and development of emissions reduction strategies. The National Ambient Air Quality Standards (NAAQS) for common pollutants, as set in terms of the NEM:AQA.

The National Dust Control Regulations (GN R.827), which were promulgated on 1 November 2013, define acceptable dust fall rates for residential areas as <600 (mg/m²/day) taken over a 30 day average (with no more than 2 exceedances per year, in non-sequential months), and non-residential areas as dust fallout >600<1200 (mg/m²/day) taken over a 30 day average (with no more than 2 exceedances per year, in non-sequential months).

6.9 National Forests Act (84 of 1998)

Supports sustainable forest management and the restructuring of the forestry sector, as well as protection of indigenous trees in general.

6.10 Municipal plans and policies

6.10.1 Mogalakwena Municipality Integrated Development Plan

The Mogalakwena Local Municipality (MLM) Integrated Development Plan (IDP) identified mining as the main economic contributor to the MLM. The IDP states industrial developments in the municipal area support the mining sector.

The IDP also identifies a number of environmental issues in the Mogalakwena area that are associated with mining. According to the IDP, mining activities in Mogalakwena predominantly take place in rural landscapes where biodiversity corridors occur.

6.11 Anglo American policies and guidelines

The Anglo American Executive Committee has endorsed and committed to the implementation of an internal document known as the Anglo American Environment Way, which is governing framework for the management of environmental impacts for all environmental projects. The Board seeks assurance of compliance with the Anglo American Environment Way standards through regular self-assessments, peer review and third-party audits.

The Anglo American Safety, Health and Environmental (SHE) Policy (Appendix G) describes Anglo's environmental vision, which is to always find ways to prevent and reduce harm to the environment (if not restore it) in the way that we design, operate and eventually close operations, always doing so in an environmentally responsible manner.

Underpinning this vision are four core principles:

- Zero mindset: Anglo American shall apply the mitigation hierarchy of avoiding, minimising and mitigating environmental impacts arising from our activities, products and services;
- No repeats: all necessary steps will be taken to learn from environmental impacts, incidents, audit findings and other non-conformances, to prevent their recurrence; and
- Non-negotiable standards and rules: common, non-negotiable.

6.11.1 Anglo American Platinum strategy and values

AAP's strategy is to create maximum value through understanding and developing the market for PGMs, grow the Company to expand into those opportunities and to conduct its business cost effectively and competently. AAP has the following six company values.



Figure 6-1: Anglo American Platinum Values

6.11.2 Anglo American Platinum environmental policy

Mogalakwena Complex is committed to the implementation of the AAP policy towards environmental management, with specific focus on water related issues. The policy states that: "Anglo American Platinum Corporation Limited, as the world's leading primary producer of platinum group metals, commits itself to the creation of a safe and healthy environment for all our employees and the citizens of the communities with which we interact".

In order to give practical expression to their commitments and to measure their progress, AAP has the following aims with regard to the environment:

- Conserve environmental resources;
- Prevent or minimise adverse impacts arising from our operations;
- Demonstrate active stewardship of land and biodiversity;
- Promote good relationships with, and enhance capacities of, the local communities of which we are a part; and
- Respect people's culture and heritage.

6.11.3 Anglo American Social Way

The Anglo Social Performance (SP) Standards prescribe the minimum level of performance expected for key management areas, where there are social risks and/or opportunities. These requirements are based on the Anglo-American Social Way Management System (SWMS), also known as the Anglo-American Social Way Version 3 (AASW3). The AASW3 is made up of three key components namely:

- Social Way Policy which sets out Anglo's vision and principles for SP, defines Anglo's systems for SP management and provides overview of SP management requirements;
- Social Way Toolkit which contains detailed guidance on the standards, processes and procedures required for effective SP through implementation of the Social Way Policy; and
- Social Way Assurance Framework which provides guidelines and outlines the requirements and processes through which sites are to be assessed for compliance with the Social Way Policy.

The AASW3 describes Anglo's Social Vision, which is to make a lasting positive contribution to the communities associated with Anglo American's operations, and to be a partner of choice for host governments and communities as well as an employer of choice. It is based on the International Finance Corporation (IFC) Performance Standard 1 (2012), which deals with the assessment and management of environmental and social risks and impacts. Underpinning this vision are four core principles:

- Engage respectfully with host communities throughout the project cycle, and be accountable to stakeholders;
- Host communities should experience a lasting benefit from the presence of Anglo American operations and AA must seek to maximise the benefits flowing from an operation in addition to traditional social investment;
- Take the necessary steps to spread the application of good practice, and to learn from negative social impacts, complaints, incidents, audit findings and other non-conformances to prevent their recurrence. In addition, put in place appropriate mechanisms for handling and resolving grievances; and
- Common, non-negotiable performance standards and procedures shall be applied throughout the Group as a minimum requirement. Anglo American seeks to assure compliance with the Social Way standards through the Good Citizenship Business Principles letters of assurance process; regular self-assessments; peer review; community consultation and third-party audits.

7 Need and desirability of the proposed activities

This section has been compiled in line with the Integrated Environmental Management Guideline on Need and Desirability (DEA, 2017). A summary of the key aspects has been included in the subsections below.

7.1 Mining benefits

The mineral extraction at Mogalakwena Complex is considered by AAP to be in the best interest of the public at large, by generating earning power both locally and internationally, in the absence of significant alternative employment opportunities in the area.

Platinum is sold both locally and overseas and therefore, the mine is an earner of foreign exchange for South Africa. In addition, the mine also has a positive impact on the economic growth of the Limpopo Province, particularly in the communities around the mine and through its rates and taxes to the National fiscus.

Mogalakwena Complex's LoM extends well beyond 2080. The proposed cable yard and pre-assembly yard will serve to provide the necessary support for the continued operation of mining activities at Mogalakwena Complex.

7.2 Environmental responsibility

The purpose of this project is to apply for Environmental Authorisation through a BA process for the cable yard and pre-assembly yard areas. This document contains management measures to avoid, minimise and reduce the potential negative impacts on the environment as a result of the proposed projects.

Monitoring of air quality, noise and water quality is in place at Mogalakwena Complex. The mine participates in relevant environmental forums. As part of the ongoing commitment to the area's water management, Mogalakwena Complex is represented on the Polokwane / PPL Treated Effluent Monitoring Committee.

Mogalakwena Complex is also actively involved in the Waterberg Air Quality Management Forum.

7.3 Socio-economic benefits

Mogalakwena Complex is considered to have a positive socio-economic benefit through local employment. Unskilled and semi-skilled labour is sourced mainly from the local communities and surrounding areas and recruitment is in conjunction with the local unemployment forum. Specialist and skilled labour are recruited outside the local boundaries when required. It is not anticipated that the proposed projects will create additional permanent jobs however it will assist the mine in operating more effectively.

7.4 Employment and local procurement opportunities

In the current planning, the labour requirements for the development of the cable yard and pre-assembly yard will be met by existing employees.

Procurement for the project, if required, will be undertaken as per the existing AAP Inclusive Procurement policies. Meaningful participation of local businesses will be maximised as far as possible and practicable.

7.5 Project timeline

It is anticipated that the development of the proposed pre-assembly yard and cable yard will be required during the second quarter of 2023 and in the first quarter of 2024 respectively and will

commence once the identified heritage sites have been mitigated (of specific relevant at the pre-assembly yard area) and a Phase 1 palaeontological assessment has been undertaken. This will be subject to the outcome of the decision received from the DMRE following the submission of the Final BA.

7.6 No-Go option

The purpose of the proposed projects are to support existing and planned activities at Mogalakwena Complex. The pre-assembly yard area is required as a temporary laydown area for the components and assembly of components required for the M3C. The cable yard is required as an additional cable repair facility to support the North Mining section at the Complex. Should the proposed projects not be implemented, Mogalakwena Complex will continue to operate as it currently operates however:

- The construction timeframes of the M3C will be hindered due to inadequate laydown area space;
- The repair of cables for the North Mining section will not be possible as the existing cable yard is scheduled to be decommissioned (currently situated within the 500m blast radius in terms of future mine plans). Therefore the new cable yard will be required replace the existing cable yard.

Both of these projects will cumulatively facilitate mining and processing activities at Mogalakwena Complex to ensure that these activities can be optimised and more effectively executed.

8 Motivation for the overall preferred site, activities and technology alternatives including a full description of the process followed to reach the proposed alternatives within the site

As per the Department of Environmental Affairs Guideline on Criteria for determining Alternatives in EIA: “Key criteria for consideration when identifying alternatives are that they should be “practicable”, “feasible”, “relevant”, “reasonable” and “viable”.

A range of alternatives exists, not all of which are necessarily appropriate for each project under consideration. The different categories of alternatives that can be identified include:

- Activity alternatives;
- Location alternatives;
- Process alternatives;
- Demand alternatives;
- Scheduling alternatives;
- Input alternatives;
- Routing alternatives;
- Site layout alternatives;
- Scale alternatives;
- Design alternatives; and
- The no-go alternative.

Specialist input was obtained in order to identify alternatives associated with each of the proposed projects.

8.1 Cable yard alternatives

The categories of alternatives in Table 8-1 were considered in accordance with the key criteria indicated above for the proposed cable yard.

Table 8-1: Categories of alternatives – cable yard

Type of alternative	Details
Location	<p>Preferred location:</p> <p>The preferred location of the proposed cable yard is to the north east of Zwartfontein pit adjacent to the haul road (opposite Mogalakwena North Concentrator) on the Farm Zwartfontein 818 LR (Figure 4-1)</p> <hr/> <p>Alternative locations:</p> <p>Two alternative locations were assessed for the proposed cable yard as follows:</p> <p><u>Area 1</u></p> <p>Located adjacent to the Nitro Plus facility situated on the north western corner of the Farm Zwartfontein 818 LR. This area has already been demarcated for a planned Very Low-Grade Ore Dump (VLGOD) in accordance with the mine plan. Therefore this will not be a suitable location for the proposed cable yard</p> <p><u>Area 2</u></p>

Type of alternative	Details
	Located at Waste Rock Dump (WRD) W02 to the west of North Pit on the Farm Overysel 815 LR next to the magazines explosive area. The workshop will fall under the definition of a “public building” as contemplated in Chapter 1 of the Explosives Regulations (Act 85 of 1993) - “public building” shall mean a church, university, workshop, sports ground stand and erections of a like-nature where persons are accustomed to assemble. No buildings may therefore be constructed in the danger zones and therefore the cable yard cannot be located in this area.
Activity	<p>Preferred sewage handling option:</p> <p>All sewage effluent will be collected within a conservancy tank at the proposed cable yard site. The conservancy tank is a closed system which will be emptied every 72 hours. The effluent will be transported to an existing sewage treatment works at Mogalakwena Complex.</p>
	<p>Alternative sewage handling option:</p> <p>Construction of septic tanks with associated French Drains. Due to the potential ground and surface water contamination risks associated with this arrangement as well as the requirement for a Water Use Licence, this option was not deemed feasible.</p>

8.2 Pre-assembly Yard alternatives

The categories of alternatives in Table 8-2 were considered in accordance with the key criteria indicated above for the proposed Pre-assembly Yard.

Table 8-2: Categories of alternatives – Pre-assembly Yard

Type of alternative	Details
Location	<p>Preferred location:</p> <p>The proposed pre-assembly yard will be located within the existing Mogalakwena Complex mining right and surface lease areas to the south of the existing return water dam at the Vaalkop tailings dam on the Farm Vaalkop 819 LR</p>
	<p>Alternative locations:</p> <p>No alternative locations were investigated as the area required for the proposed pre-assembly yard is 18ha. Mogalakwena Complex currently does not have the required space which is also located in close proximity to the proposed M3C (for which the area is required to pre-assemble M3C components)</p>
Activity	<p>Preferred sewage handling option:</p> <p>Due to the temporary nature of the site, permanent sewage handling facilities will not be feasible. Portable toilets will therefore be provided within the containerised buildings to be located within the proposed Pre-assembly Yard area. These facilities will be emptied and the effluent will be transported to an existing sewage treatment works at Mogalakwena Complex</p>
	<p>Alternative sewage handling option:</p>

Type of alternative	Details
	Construction of septic tanks with associated French Drains. Due to the temporary nature of the site (to be rehabilitated once the M3C is constructed), potential ground and surface water contamination risks associated with this arrangement as well as the requirement for a Water Use Licence, this option was not deemed feasible

8.3 No go alternative

The purpose of the proposed projects are to support existing and planned activities at Mogalakwena Complex. The pre-assembly yard area is required as a temporary laydown area for the components and assembly of components required for the M3C. The cable repair yard is required as an additional cable repair facility to support the North Mining section at the Complex. Should the proposed projects not be implemented, Mogalakwena Complex will continue to operate as it currently operates however:

- The construction timeframes of the M3C will be hindered due to inadequate laydown area space;
- The repair of cables for the North Mining section will not be possible as the existing cable yard is scheduled to be decommissioned (currently situated within the 500m blast radius in terms of future mine plans). Therefore the new cable yard will be required replace the existing cable yard.

Both of these projects will cumulatively facilitate mining and processing activities at Mogalakwena Complex to ensure that these activities can be optimised and more effectively executed.

9 Details of the public participation process to be followed

9.1 Objectives of stakeholder engagement

The objectives of public participation for the various phases of the environmental authorisation process are presented in the sections below.

9.1.1 Project Announcement Phase

The objectives of the stakeholder engagement during the announcement phase are to introduce the project to I&APs and to inform them that an environmental authorisation process will be followed.

9.1.2 During Basic Assessment

The objectives of public participation during the Basic Assessment phase is to provide sufficient and accessible information to I&APs in an objective manner to enable them to raise comments, issues of concern and suggestions.

9.1.3 During the Decision-Making Phase

Following the outcome of the decision-making process by authorities, stakeholders will be informed of the outcome and how and by when the decision can be appealed.

9.2 Stakeholder Identification

The NEMA EIA Regulations (GNR 982 as amended) require identification of and consultation with communities and I&APs. In terms of Section 24 (2) of NEMA, specific State Departments were identified and recognised as commenting authorities on aspects of this Basic Assessment. Representatives from these departments are included in the stakeholder database.

A register of I&APs in terms of Section 42 of the EIA Regulations (GNR 982 as amended) was compiled. This regulation requires that the register contain full contact details of registered I&APs and be submitted to the competent authority⁶.

I&APs identified in previous environmental authorisations processes, together with lists of stakeholders with whom Mogalakwena Complex has regular contact and networking and referral, formed the basis for the development of the stakeholder database. Key stakeholders include:

- Mapela Traditional Authority (Landowner);
- Landowners adjacent to the property where the activity is proposed to take place;
- Department of Mineral Resources and Energy, Limpopo;
- Department of Water and Sanitation, Limpopo;
- Limpopo Department of Economic Development, Environment and Tourism;
- Department of Agriculture, Land Reform and Rural Development;
- Eskom;
- Cooperative Governance, Human Settlements and Traditional Affairs;
- Mogalakwena Local Municipality; and

⁶ In order to maintain privacy of I&APs contact details, the register of I&APs in this report will not contain contact details but will be kept on record.

- Waterberg District Municipality

Box 1 below provides more information regarding the distinction between I&APs and registered I&APs.

Box 1. Distinction between I&AP's and Registered I&APs
The NEMA Regulations (GN 982 amended) distinguishes between I&AP's and registered I&APs.
I&AP's, as stated in Section 24(4)(d) of the NEMA include: (a) any person, group of persons or organisation interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.
In terms of the Regulations " registered interested and affected parties " means:
An interested and affected party whose name is recorded in the register opened for that application.
For that purpose, an EAP managing an application must open and maintain a register which contains the names, contact details and addresses of:
<ul style="list-style-type: none"> • All persons who have submitted written comments or attended meetings with the applicant or EAP; • All persons who have requested the applicant or EAP managing the application, in writing, for their names to be placed on the register; and • All organs of state which have jurisdiction in respect of the activity to which the application relates.

9.2.1 Identification of Landowners

The identification of landowners in the area is an important part of the stakeholder engagement process. SRK conducted a deeds search to identify landowners directly affected, adjacent to and in the immediate surroundings of Mogalakwena Complex. Refer to Table 9-1.

Table 9-1: Affected Landowners

Project	Farm Name	Farm Portions	Owner	Mogalakwena Complex Area
Pre-assembly yard	Vaalkop 819 LR	Portion 0	National Government of the RSA	Mining and surface (Mapela lease)
Cable yard	Zwartfontein 818 LR	Portion 0	National Government of the RSA	Mining and surface (Mapela lease)

9.2.2 Properties adjacent to the proposed projects

Details of the properties directly adjacent to the proposed pre-assembly yard and cable yard areas are provided in Table 9-2.

Table 9-2: Properties adjacent to proposed projects

Project	Farm Name	Farm Portions	Owner
Pre-assembly yard	Zwartfontein 818 LR	Portion 0	National Government of the RSA*
	Sandsloot 236 KR	Portion 0	National Government of the RSA*
	Tweefontein 238 KR	Portions 1, 2 Re and Portion 3	National Government of the RSA*
	Armoede 823 LR	Portion 0 Re	Rustenburg Platinum Mines Ltd
Cable yard	Blinkwater 820 LR	Portion 0 Re	National Government of the RSA*

Project	Farm Name	Farm Portions	Owner
	Vaalkop 819 LR	Portion 0	National Government of the RSA*
	Zwartfontein 814 LR	Portion 0	National Government of the RSA*
	Overysel 815 LR	Portion 0	National Government of the RSA*

*Held in Trust by the National Government of the Republic of South Africa.

9.2.3 Identification of District and Local Municipalities

The project areas fall within the jurisdiction of the Waterberg District Municipality and the Mogalakwena Municipal Area Local Municipality in Limpopo. Mogalakwena Complex is situated in Ward 13 of the Mogalakwena Local Municipality. Details of the relevant municipalities and respective ward councillors are provided in Table 9-3.

Table 9-3: District and Local Municipalities

Municipality	Contact Person	Designation
Mogalakwena Local Municipality	Morris Maluleka	Acting Municipal Manager
Mogalakwena Local Municipality	Lebogang Morata	Town planning officer
Mogalakwena Local Municipality	Cllr M.J. Mampane	Ward Councilor (Ward 13)
Waterberg District Municipality	Gladwin Tloubatla	Acting Municipal Manager
Waterberg District Municipality	Kabelo Mosito	Head of Communications

9.2.4 Identification of Relevant Government Departments

The relevant authority applicable to the environmental authorisation process for the proposed project is the DMRE and contact details are provided in Table 9-4. A pre-application meeting was held with the DMRE on 3 August 2022 to discuss and confirm the process and way forward for the proposed environmental authorisation for the projects. Refer to Appendix H for the meeting minutes and presentation.

Table 9-4: Relevant Government Departments

Department	Contact Person
DMRE - Polokwane Office	Mr Nicolas Chavalala

Other commenting authorities that will be consulted with during this process include DWS, Limpopo Department of Economic Development Environment and Tourism (LEDET), Department of Agriculture, Rural Development and Land Reform, Cooperative Governance, Human Settlements and Traditional Affairs, SAHRA, Mogalakwena Local Municipality, and the Waterberg District Municipality. Proof of the submission of the Draft BAR to the commenting authorities for comment is included in Appendix H.

9.3 Stakeholder Engagement

Table 9-5 provides the stakeholder engagement approach for the proposed projects.

Table 9-5: Stakeholder engagement approach

Announcement phase		
Written notices were sent to the interested and affected parties as per the existing Mogalakwena Complex I&AP database via email and hand delivered where possible. The project was announced to the public on 21 October 2022 through the methods summarised in the table below:		
Stakeholder group	Announcement activity/materials	Date of announcement / distribution of materials
Mapela TA	E-mailed notification letter containing the Background Information Letter (BIL) and registration and comment form	21 October 2022
	Placement of notices at the Mapela TA Offices	21 October 2022
	Placement of 100 copies of the Background Information Letter (BIL) and comment sheet (25 Sepedi copies and 75 English copies) at the Mapela TA offices	21 October 2022
Mapela TT	E-mailed notification letter containing the Background Information Letter (BIL) and registration and comment form	21 October 2022
Mokopane TA	E-mailed notification letter containing the Background Information Letter (BIL) and registration and comment form	21 October 2022
Mokopane TT	E-mailed notification letter containing the Background Information Letter (BIL) and registration and comment form	21 October 2022
Public	236 emails including English BIL and comment sheet to various stakeholder groups notifying them about the project	21 October 2022
	646 SMS notifications informing stakeholders of the project and contact details to obtain additional information	21 October 2022
	Placement of 1 English and 1 Sepedi site notices at strategic points including Mogalakwena Complex social performance office, Mogalakwena North Concentrator and South Concentrator	21 October 2022
	Placement of 300 copies of the BIL and comment sheet at the Mogalakwena Complex social performance office, Mogalakwena North Concentrator and South Concentrator (75 English and 25 Sepedi at each site)	21 October 2022
	Placement of the BID and registration and comment form in English and Sepedi on SRK's website (Basic Assessment Report and Environmental Management Programme for a Cable Repair Yard and Pre-Assembly Yard to be located at Anglo American Platinum, Rustenburg Platinum Mines, Mogalakwena Complex, L (srk.com))	21 October 2022
	Advertisements in English and Sepedi in The Bosvelders	20 October 2022
Refer to Appendix C for copies and proof of all notification materials.		

Availability of the Draft Basic Assessment Report for Public Comment

The DBAR was made available for public comment for a period of 30 days from 2 November 2022 – 3 December 2022. The availability of the DBAR was announced as follows:

- Notification to registered I&APs of the availability of the DBAR via SMS, email and letters
- Posting the DBAR, notification letter and comment form on the SRK website ([Basic Assessment Report and Environmental Management Programme for a Cable Repair Yard and Pre-Assembly Yard to be located at Anglo American Platinum, Rustenburg Platinum Mines, Mogalakwena Complex, L \(srk.com\)](#))
- The DBAR, with letters inviting comments on the DBAR and comment forms were made available for public review at selected easily accessible places around the mine area

Final Basic Assessment Report to Department of Mineral Resources

The Final BAR was prepared at the end of the comment period and updated with issues, comments and suggestions raised by stakeholders during the public review period. The Final BAR will be submitted to the DMRE for decision making.

Comments and Responses Report

Comments received throughout the Basic Assessment process would have been collated into a Comments and Responses Report (CRR) however no comments were received specific to the proposed projects. Requests to be registered on Mogalakwena's I&APs database were however received by e-mail and telephonically. SRK has updated the database with the additional stakeholder's details.

Summary of issues raised by I&APs

No comments were received during the process, only requests to be added onto the I&AP database.

10 The environmental attributes associated with the baseline environment

This section provides a summary of the key biophysical and socio-economic attributes for the pre-assembly yard and cable yard areas within the mining right and surface lease areas.

Due to the nature of the proposed projects (limited surface impacts) and in consultation with the Department of Forestry, Fisheries and the Environment (DFFE) National Screening Tool (Appendix D) only specific specialist investigations deemed necessary to be conducted (refer to Section 2.4). Where specialist studies have not been conducted specifically for these projects, the baseline has been supplemented with recent investigations which have taken place for other projects proposed at Mogalakwena Complex. Refer to Appendix E for the specialist studies undertaken specifically for these projects.

10.1 Outcome of the screening tool for the proposed projects

Based on the outcome of the environmental screening tool exercise, the only sensitivities within the proposed project locations which was highlighted as very high were palaeontology and biodiversity (Table 10-1). It has been recommended (refer to section 16.1) that a Phase 1 Paleontological assessment is conducted prior to the pre-construction phase for both the pre-assembly and cable yard projects. In addition to this, the ecology assessment has made extensive recommendations for mitigation of any impacts associated with floral ecology and indigenous species. A high sensitivity theme was also noted for the civil aviation however since Mogalakwena Complex is an operational mine and no infrastructure will be constructed at heights posing an impact to aircraft for this project, it is not anticipated that the proposed project pose an impact on this theme.

Table 10-1: Pre-assembly and cable yard proposed locality environmental sensitivities

Theme	Sensitivity			
	Very high	High	Medium	Low
Agriculture Theme			X	
Animal Species Theme			X	
Aquatic Biodiversity Theme				X
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme			X	
Palaeontology Theme	X			
Plant Species Theme				X
Terrestrial Biodiversity Theme	X			

10.2 Climate and meteorology

The information presented in this section is extracted from the specialist surface water study and air quality study undertaken by SRK in 2021.

10.2.1 Rainfall and evaporation

Rainfall data was sourced from Weather Station W0633482 located approximately 15 km southwest of the mine (1903-2000), as well as from the on-site weather stations (from 2000 to present). Together, the stations have a 117-year record of rainfall data. The mean annual precipitation (MAP) for weather station W0633482 is 620 mm, as reflected in Table 10-2.

During the rainy season a maximum of 8 to 12 rain days per month is expected, whilst in the dry season a maximum of one rainy day may be expected per month. Most rain (85%) falls in the six-month period between November and April. Only 8% of the rainfall occurs between May and September. The rainfall is mainly in the form of thunderstorms. Hail, which is often associated with thunderstorms, does occur during the hot summer months.

Evaporation data (station WB AB A6E001) are presented in Table 10-2. The average annual A-pan evaporation is 2301 mm which indicates that evaporation exceeds the MAP of 620 mm (the mean annual S-pan evaporation at Mogalakwena Complex is 1 755 mm).

Table 10-2: Rainfall and evaporation data

Month	Average Rainfall (mm) WB 633482 (1903 to 2000) and Site Rainfall (2000 - Present)			Average Evaporation (mm) WB AB A6E001	
	Average	Maximum	Minimum	A-pan	S-pan
September	12.8	94.0	0	200.4	161.3
October	45.1	194.2	0	233.8	192.3
November	92.8	349.0	0	225.4	184.5
December	119.1	302.0	6.6	235.1	193.5
January	119.2	444.6	0	233.3	191.8
February	88.7	351.4	0	202.1	163.0
March	75.0	307.0	0	193.8	155.3
April	36.0	188.7	0	157.3	121.4
May	14.6	174.5	0	135.6	101.3
June	5.4	71.7	0	113.5	80.7
July	5.2	86.6	0	212.4	88.1
August	6.2	56.7	0	158.4	122.4
TOTAL	620			2301.1	1755.6

An A-Pan is a galvanised steel circular container that is placed above the ground and evaporation is measured by measuring change in water level within the pan. The S-Pan is an evaporation pan that is installed into the ground. The conversion factor from S-Pan to lake was obtained from The Surface Water Resources of South Africa reports (Midgley, Pitman, Middleton, 2012).

10.2.2 Site temperature

Ambient air temperature is important, both for determining the effect of plume buoyancy (as the larger the temperature difference between the emissions plume and the ambient air, the higher the plume is able to rise), and determining the development of the mixing depth and inversion layers.

The monthly average, maximum and minimum temperatures are presented in Table 10-3. The average temperature ranges from 12.7 °C to 23.6 °C, with a minimum temperature of 3.9 °C and a maximum temperature of 33.6 °C.

Table 10-3: Average monthly temperature data (°C)

Month	Average Temperature	Maximum Temperature	Minimum Temperature
January	22.9	33.2	11.9
February	22.8	31.9	14.1
March	21.9	32	9.9
April	19.2	29.5	10.1
May	15.6	25.4	6.2
June	13.0	22.9	3.9
July	12.7	22.9	4.1
August	15.8	25.4	4.6
September	18.7	29.2	5.9
October	20.6	33.1	8.2
November	22.2	32.9	9.1
December	23.6	33.6	12
Annual average	19.1	29.3	8.3

10.2.3 Wind speed and direction

The wind roses for all hours, daytime and night-time for the modelled Lakes Environmental data for the period January 2017 to December 2019 indicate that the prevailing wind directions throughout the data period are predominantly from the east-northeast with lower occurrences from the northeast, east and east-southeast. The wind class frequency distribution shows that 92.1% of winds can be classified as low speed winds (< 5.7 m/s), while 7.9% of winds can be classified as moderate to high wind speeds (5.7 to 11.1 m/s).

The average wind speed for the period from January 2017 to December 2019 is 3.44 m/s with calm conditions occurring 0.36% of the time. During the day (06h00-18h00), the average wind speed is 2.95 m/s with calm conditions occurring 0.64% of the time. The average wind speed during the early night is 3.68 m/s and increases to 4.17 m/s during the latter part of the night.

Seasonal wind roses show that there are prevailing east-north-easterly winds during the summer, autumn and spring. During winter, east-south-easterly winds are prevalent. The frequency of winds from the east increases during autumn albeit at lower wind speeds. The highest average wind speeds of 3.76 m/s occur during spring with calm conditions occurring 0.37% of the time. The lowest average wind speeds occur during autumn with an average wind speed of 3.13 m/s and calm conditions occur 0.44 % of the time. The wind speeds during summer and winter are 3.59 and 3.24 m/s respectively.

It is not expected that the proposed pre-assembly yard and cable yard projects will have an impact on climate of the area within which Mogalakwena Complex is located.

10.3 Geology

Mogalakwena Complex is situated in the Northern Limb of the Bushveld Igneous Complex. The Platreef orebody lies at the base of the Main Zone of the Bushveld Complex and is overlain by

gabbroites which are in turn overlain by Upper Zone ferrogabbros. It is a 100 m thick tabular body that strikes north-south, dips 45° to the west and reaches a depth of at least 2,000 m.

It is not expected that the proposed pre-assembly yard and cable yard projects will have an impact on the geology of the area.

10.4 Topography

The Limpopo Province can be split into several topographic zones. In the east is the flat to gently undulating Lowveld plain, at an altitude of 300 to 600 metres above mean sea level (mamsl), bounded in the west by the Northern Drakensberg escarpment and Soutpansberg, with steep slopes and peaks up to the 2 000 mamsl.

The topography of the study area can be described as having an average undulating with a maximum elevation of 1 830m and a minimum of 875m above mean sea level (AMSL). The landscape varies between rocky outcrops in the immediate vicinity of the mine to increased elevations to the south-east and south west.

It is not expected that the proposed pre-assembly yard and cable yard projects will have an impact on the topography of the area.

10.5 Soils, land use and land capability

The information presented in this section is extracted from the specialist soils, land use and land capability study compiled by Earth Science Solutions (Pty) Ltd (ESS) in 2019. It should be noted that this study was undertaken for the broader site which includes areas within which the pre-assembly yard and cable yard are located.

Table 10-4 provides a summary of the soils, land use and land capability baseline within the proposed pre-assembly yard and cable yard areas:

Table 10-4: Soils, land use and land capability baseline

Soil characterisation	Soil sensitivity	Land capability
<ul style="list-style-type: none"> The soils encountered can be broadly categorised into three major groupings, with a number of dominant and sub dominant forms that characterise the area. The major soil forms are closely associated with the lithologies (geology) from which the soils are derived (in-situ formation), the topography and general geomorphology of the site, the effects of slope and attitude of the land forms and the pedogenetic processes involved affecting the soil pedogenesis and ultimately the soil forms classified and mapped. Soils include deep, greyish sands, eutrophic plinthic catenas, red, yellow apedal freely drained soils with high base status, clayey in bottomlands. Land types mainly Bd, Bc, Ae and Ia⁷. The soils mapped range from shallow sub-outcrop and outcrop of parent materials, to moderately deep sandy clay loams and structured clay loams, all of which are associated with either a thin saprolitic layer or a hard rock as the underlying "C" horizon. The clay content and clay morphology are significant to the soil structure and texture, the difference in parent lithologies noted as the primary difference in these aspects. 	<ul style="list-style-type: none"> Specific to the Mogalakwena site is the obvious variation in the soils across the site associated with the differing lithologies, the strongly structured and clay rich soils associated with the ore bearing mafic materials (pyroxenite, norite etc.) having very different workability and management properties to the more coarse grained and relatively much shallower and clay poor granite derived materials. Soils within the proposed pre-assembly yard and cable yard areas are classified as moderately sensitive to sensitive. 	<ul style="list-style-type: none"> The land capability classification within the pre-assembly yard and cable yard areas is a mixture of grazing land and wilderness/conservation land Grazing land: The classification of grazing land covers the shallower and transitional zone soils that are well drained. These soils are generally darker in colour, and although not always free draining to a depth of 750mm, they are capable of sustaining palatable plant species, especially since only the subsoil's (at a depth of >500mm) are periodically wetted. The majority of the study area classifies as low intensity grazing land or wilderness status. Wilderness / Conservation Land: The shallow rocky areas and soils with a structure stronger than strong blocky are characteristically poorly rooted and support at best very low intensity grazing, or more realistically are of a wilderness character and rating. The baseline study indicates that the proposed development will impact some sites with sensitive to moderately sensitive soil forms, albeit that the land capability is for the most part considered to be of a poor grazing to wilderness land capability rating.
Soil chemical and physical characteristics		
Chemical characteristics	Soil physical characteristics	Soil erosion and compaction
<ul style="list-style-type: none"> In general, the pH ranges from acid at 5.2 to neutral and slightly alkaline at 6.25, a base status ranging from 11me% to over 30me% [Eutrophic (slight leaching status) to Dystrophic (moderate leaching status)], and nutrient levels reflecting generally high levels of calcium and sodium, but deficiencies in the levels of magnesium, potassium, phosphorous, copper, aluminium and zinc, with very low stores of organic carbon matter. The more structured (moderate blocky to prismatic) and associated sandy and silty clay loams returned values that are indicative of the more iron rich materials and more basic lithologies that have contributed to the soils mapped. They are inherently low in potassium reserves and returned lower levels of zinc and phosphorous. The growth potential on soils with these nutrient characteristics is at best moderate to poor and additions of nutrient and organics (compost) will be necessary if vegetative cover is to be propagated on these soils. They are at best moderate or poor grazing lands, with a poor arable land capability rating. 	<ul style="list-style-type: none"> The majority of the soils mapped exhibit apedal to moderate blocky structure, moderate to good clay content and a dystrophic leaching status. The texture comprises sandy clay loam to sandy loams for the most part, with more silty loams and clay loams associated with the colluvial and alluvial derived materials associated with the lower slope and bottom land stream and non-perennial waterways. The semi-arid to arid climate (negative water balance) combined with the geochemistry of the host rock geology are conducive to the formation of evaporites, with the development of calcrete and ferruginous layers within the vadose zone. The accumulation of concentrations of iron and manganese rich fluids in solution will result in the precipitation of the salts and metals when exposed to high evaporation (negative water balance), while lithologies rich in calcium and magnesium will result in the formation of calcium carbonate layers once the soil waters is lost due to evaporation. These processes result in the development of a restrictive or inhibiting layer/zone within the profile over time, a factor that is important in a climate where water at surface is scarce, a factor important to the ecology and biodiversity of this area. 	<ul style="list-style-type: none"> Erodibility is defined as the vulnerability or susceptibility of a soil to erosion. It is a function of both the physical characteristics of a particular soil as well as the treatment of the soil. The majority of the soils mapped can be classified as having a moderate to high erodibility index in terms of their organic carbon content and clay content, while the steepness of many of the slopes add to the erosion index. The concerns around erosion and inter alia compaction, are directly related to the disturbance of the protective vegetation cover and topsoil that will be disturbed during any construction and operational phases of the development. Once disturbed, the effects and actions of wind and water are increased.
Impact	It is not expected that the proposed pre-assembly and cable yard areas will have a significant impact on the soils, land use and land capability. Refer to section 11 for the impact assessment.	

⁷ Land types refer to a class of land with specified characteristics. In South Africa it has been used as a unit denoting land at 1:250 000 scale, over which there is a marked uniformity of climate, terrain form and soil pattern. Land type Bd refers to non-red soils (Hu, Bv <33%) that are usually more dystrophic/mesotrophic than they are eutrophic, Land type Bc refers to upland duplex and marginal soils that have a Plinthic catena less than 10%, Land type Ae refers to Red (yellow soils <10%) that are more eutrophic than dystrophic/mesotrophic, and Land type Ia refers to a miscellaneous soil class.

10.6 Floral ecology and indigenous vegetation assessment



The information presented in this section is extracted from the Floral Ecological Scan and Indigenous Vegetation Verification Assessment by Scientific Terrestrial Services for the proposed Cable Yard and M3C Pre-assembly Yard Projects in January 2022 (Appendix E).

Table 10-5: Floral baseline of the proposed cable yard area

Baseline aspect	Baseline summary		
Desktop Conservation Characteristics	Biome	The study area is situated within the Savanna Biome .	
	Bioregion	The study area is located within the Central Bushveld Bioregion	
	Vegetation Type	Makhado Sweet Bushveld (SVcb 20)	
	Conservation status	Least Concerned and Poorly Protected	
	Threatened ecosystems	The study area is not situated within a threatened ecosystem, according to the National Threatened Ecosystem Database	
	Protected areas	According to the SAPAD (2021_Q3) and the NPAES (2010), a protected area, namely the Witvinger Nature Reserve , is located within a 10 km radius of the study area (however not within 5 km of the reserve ⁸).	
	Ecological support area (ESA)	The entire study area is located within a Category 1 Ecological Support Area (ESA) . These are natural, near natural and/or degraded areas that are selected to support CBAs by maintaining ecological processes.	
	High biodiversity importance	The entire study area is located within in an area of High Biodiversity Importance. These areas are regarded to pose a high risk for mining.	
Plant species theme	The entire study area is considered to have a low sensitivity .		

Figure 10-1: Desktop conservation characteristics pertaining to vegetation types, national protected and conservation areas, ESAs as well as high biodiversity importance within the proposed cable yard area

⁸ The Listing details applicable to the Limpopo Province (according to Listing Notice 3: List of Activities and Component Authorities Identified in Terms of Sections 24(2) and 240) state that "Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA) or from the core area of a biosphere reserve" will trigger a Listing Activity. The Wit Vinger Nature Reserve is over 5 km from the study area. As per the listing notices, the listings are triggered only if the development is within 10 km of a World Heritage Site or a National Park or within 5 km of Nature Reserves. As the proposed development associated with the study area is not within 5 km of the Wit Vinger Nature, no listings are triggered.

<p>Ground-truthed vegetation characteristics</p>	<p>The biodiversity of the study area can be defined under two broad habitat units namely Disturbed Thornveld and Secondary Thornveld Habitat (Figure 10-2). Indigenous vegetation was recorded within the Disturbed Thornveld Habitat, but not within the Secondary Thornveld Habitat (Figure 10-3). These habitat units were distinguished based on species composition, vegetation structure, ecological function, physical nature of the environment and habitat condition.</p>	 <p>Figure 10-2: Habitat units associated within the proposed cable yard study area on a macroscale.</p>	 <p>Figure 10-3: Habitat units associated with indigenous vegetation within the proposed cable yard study area on a macroscale.</p>
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<p>Habitat overview</p>	<p><u>Disturbed Thornveld Habitat</u></p> <ul style="list-style-type: none"> Comprises the smallest extent of the study area (approximately 2 ha) and was characterised by a semi-open to closed woody layer with small, scattered areas that had a slightly rockier affinity. Has not been impacted directly by anthropogenic activities or mining expansion and thus conforms to the definition of indigenous vegetation (as floral communities have not been significantly transformed within the last decade). The habitat is surrounded by infrastructure servitudes and historic mine expansion within the north-eastern, western, and southern boundaries of the study area. This has resulted in several edge effects impacting on habitat conditions, e.g., alien and invasive plant (AIP) proliferation. At present, the habitat is associated with indigenous encroachment, particularly by <i>Dichrostachys cinerea</i> and several <i>Aloe</i> species, further serving as an indication of poor veld conditions and an alteration in natural ecological drivers such as herbivory and fire regimes. The current and historic association with disturbances has therefore resulted in degraded floral communities that are markedly less diverse than that of the surrounding natural habitat. Although the habitat unit provides habitat for indigenous vegetation, the alteration in fire and herbivory regimes and the residual impacts from nearby historic activities (e.g., mining activities etc), have resulted in a habitat that is no longer being considered representative of the reference vegetation type, i.e., the Makhado Sweet Bushveld. <div data-bbox="341 1228 2745 1743">  </div> <p>Figure 10-4: Photographs illustrating the landscape associated with the Disturbed Thornveld Habitat Unit: a-b) typical landscape (with encroaching species (including <i>Dichrostachys cinerea</i> and <i>Aloe</i> species) in the background) associated with the habitat unit, and c) woody encroachment by <i>Dichrostachys cinerea</i> is evident in parts of the habitat.</p>
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	<p><u>Secondary Thornveld Habitat</u></p> <ul style="list-style-type: none"> The largest habitat within the study area, (approximately 2.6 ha) Largely associated with historic stockpiles (see image (d)) and therefore a high association with disturbance (reflected in the floral communities by the presence of AIPs and encroaching indigenous vegetation).
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- Habitat unit was characterised by a poorly developed forb layer which mainly comprised alien weeds. These historically transformed sections have not yet been rehabilitated. The resultant habitat is thus uneven and dominated by indigenous encroaching woody species as well as several listed AIP species.
- Given the level of transformation and the subsequent impacts to the vegetation associated with this habitat unit that occurred within the last decade, the current vegetation within the habitat does not meet the definition of indigenous vegetation as per NEMA Listing Notices.
- Furthermore, an alteration in species composition and vegetation structure has resulted within the current vegetation communities and as such, the Secondary Thornveld Habitat is no longer considered representative of the reference vegetation type.



Figure 10-5: Photographs illustrating the landscape associated with the Secondary Thornveld Habitat: a-b) typical areas in which berms have been created and where historic stockpiles have not been rehabilitated. Significant woody encroachment is evident within much of this habitat unit. Photo c) illustrates surrounding servitude areas which serve as a source of disturbance and result in edge effect impacts, with d) illustrating the historically transformed areas (2013).

Species of conservation concern

- No Red Data Listed (RDL) species were recorded within the study area
- No Threatened or Protected Species (TOPS) were observed during the field assessment.
- However, two protected tree species as per the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), namely *Sclerocarya birrea* subsp. *caffra* and *Combretum imberbe* were identified within the study area.
- A provincially protected species as per the Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA), namely *Heurnia* sp., was recorded within the Disturbed Thornveld Habitat and has the potential to occur within the Secondary Thornveld Habitat.

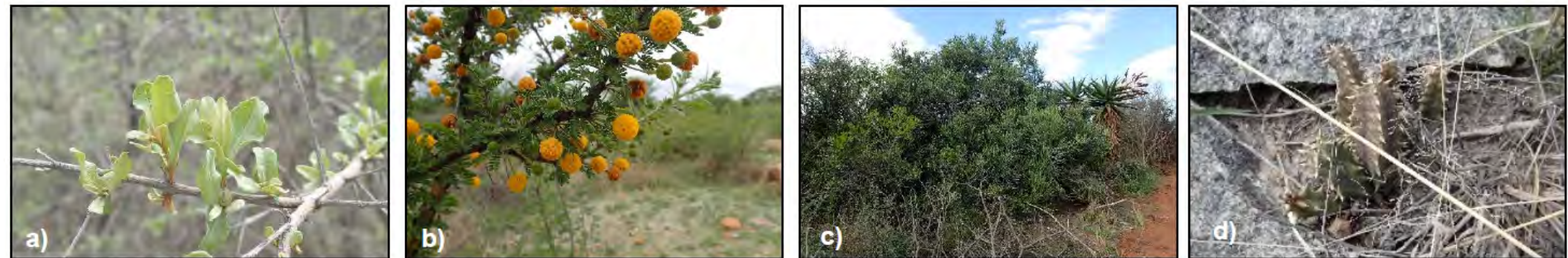


Figure 10-6: Photographs of plant species recorded within the study area: a) *Combretum imberbe* (a NFA woody species recorded within the Disturbed Thornveld Habitat), b) *Vachellia permixta* (an infrequently recorded woody species recorded within the Disturbed Thornveld Habitat), c) *Euphorbia tirucalli* (in the left) and *Aloe marlothii* (in the right; succulent species recorded within the Secondary Thornveld), and d) *Huernia* species (a LEMA protected species recorded within the Disturbed Thornveld Habitat).

Alien and Invasive Plant (AIP) Species

A total of nine AIP species were recorded within the study area. The density of AIPs within the study area varied; overall the Heavily Degraded Habitat supported higher density of AIPs.

Scientific Name	Common Name	Origin	NEMBA Category	Secondary Thornveld	Disturbed Thornveld
Woody Species					
<i>Plumeria rubra</i>	Frangipani	Central America	NL	x	x
<i>Tecoma stans</i>	Yellow bells	Mexico & Southern USA	1b		x
Herbaceous Species					
<i>Bidens pilosa</i>	Blackjack	South & Central America	NL	x	x
<i>Gomphrena celosioides</i>	Bachelor's Button	South America	NL		x
<i>Schkuhria pinnata</i>	Dwarf Mexican Marigold	Central America	NL	x	x
<i>Solanum elaeagnifolium</i>	Silver-leaf bitter apple	Southern USA	1b	x	x
<i>Tagetes minuta</i>	Kaki bos	South & Central America	NL	x	x
Succulent Species					
<i>Agave sisalana</i>	Sisal	Central America	2	x	x
Graminoid Species					
<i>Pennisetum setaceum</i>	Fountain grass	East Africa	1b		x

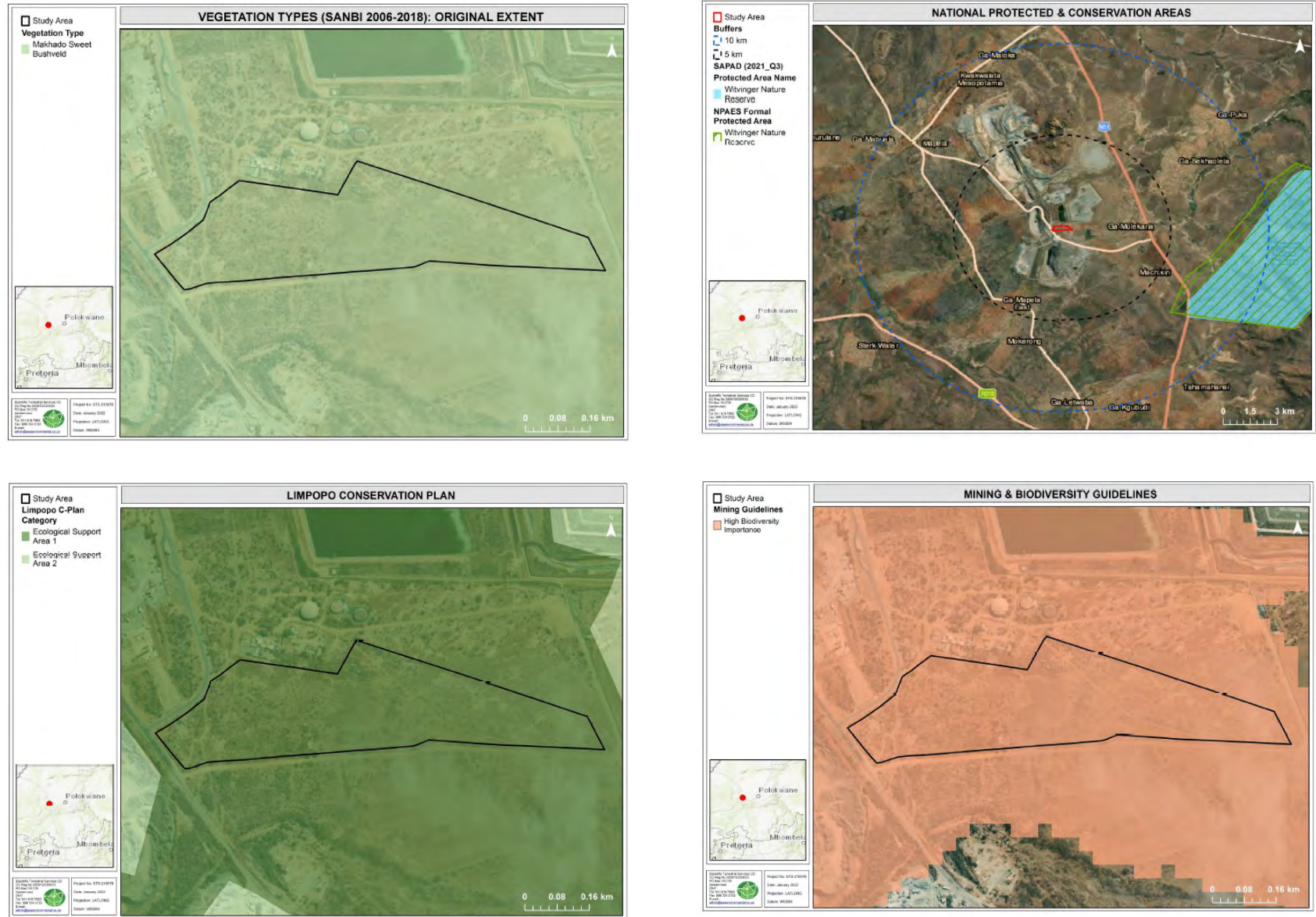
Sensitivity

- The Screening Tool identified the study area to be in a low sensitivity area for the Plant Species Theme and a very high sensitivity area for the Terrestrial Biodiversity Theme
- A low habitat sensitivity is associated with the Secondary Thornveld Habitat Unit
- A moderately low sensitivity is associated with the Disturbed Thornveld Habitat



Impact The proposed project will not impact on indigenous vegetation within the Secondary Thornveld Habitat but will however impact on indigenous vegetation with the Disturbed Thornveld Habitat (refer to Section 11 for an assessment of the potential impacts)

Table 10-6: Floral baseline of the proposed pre-assembly yard area

Baseline aspect	Baseline summary		
Desktop Conservation Characteristics	Biome	The study area is situated within the Savanna Biome .	 <p data-bbox="1003 1428 2760 1480">Figure 10-7: Desktop conservation characteristics pertaining to vegetation types, national protected and conservation areas, ESAs as well as high biodiversity importance within the proposed pre-assembly yard area</p>
	Bioregion	The study area is located within the Central Bushveld Bioregion	
	Vegetation Type	Makhado Sweet Bushveld (SVcb 20)	
	Conservation status	Least Concerned and Poorly Protected	
	Threatened ecosystems	The study area is not situated within a threatened ecosystem, according to the National Threatened Ecosystem Database	
	Protected areas	According to the SAPAD (2021_Q3) and the NPAES (2010), a protected area, namely the Witvinger Nature Reserve , is located within a 10 km radius of the study area (however not within 5 km of the reserve ⁹).	
	Ecological support area (ESA)	The entire study area is located within a Category 1 Ecological Support Area (ESA) . These are natural, near natural and/or degraded areas that are selected to support CBAs by maintaining ecological processes.	
High biodiversity importance	The entire study area is located within in an area of High Biodiversity Importance. These areas are regarded to pose a high risk for mining.		
Plant species theme	The entire study area is considered to have a low sensitivity .		
Ground-truthed vegetation characteristics	The biodiversity of the study area can be defined under two broad habitat units namely Heavily Degraded Habitat and Secondary Thornveld Habitat (Figure 10-8). No indigenous vegetation was recorded within either of the two habitats.		<p data-bbox="1418 1512 1706 1543">Heavily Degraded Habitat</p> <ul data-bbox="1418 1554 2760 1711" style="list-style-type: none"> • This habitat unit (approximately 2.8 ha) was largely associated with areas of little to no vegetation (Figure 10-9) as well as areas that were historically built-up which has subsequently become dilapidated and have not been the subject of any rehabilitation efforts. • Overall, the floral community associated with this habitat are degraded in nature and are typically associated with i) Alien and invasive plants (AIPs), ii) encroaching woody species (including <i>Dichrostachys cinerea</i> and <i>Vachellia tortilis</i> subsp. <i>heteracantha</i>), and iii) a poorly developed grass and forb layer.

⁹ The Listing details applicable to the Limpopo Province (according to Listing Notice 3: List of Activities and Component Authorities Identified in Terms of Sections 24(2) and 240) state that “Areas within 10 km from national parks or world heritage sites or 5 km from any other protected area identified in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) (NEMPAA) or from the core area of a biosphere reserve” will trigger a Listing Activity. The Wit Vinger Nature Reserve is over 5 km from the study area. As per the listing notices, the listings are triggered only if the development is within 10 km of a World Heritage Site or a National Park or within 5 km of Nature Reserves. As the proposed development associated with the study area is not within 5 km of the Wit Vinger Nature, no listings are triggered.

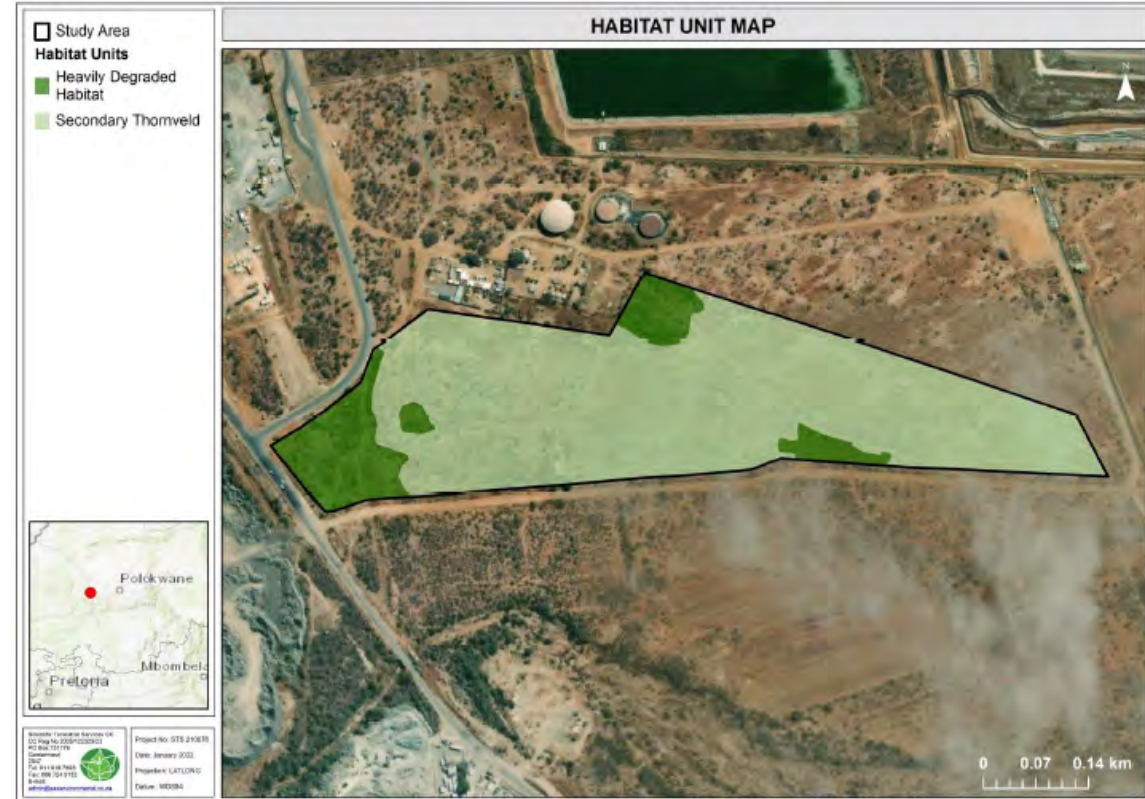


Figure 10-8: Habitat units associated within the proposed pre-assembly yard area

- Given the level of transformation and the associated impacts to the vegetation associated with this habitat unit, the current vegetation within the habitat unit does not meet the definition of indigenous vegetation as per NEMA LNs.

Given the level of transformation and overall degradation of the floral communities associated with the Heavily Degraded Habitat unit, it is no longer considered representative of the reference vegetation type, i.e., the Makhado Sweet Bushveld.



Figure 10-9: Photographs illustrating the landscape associated with Heavily Degraded Habitat: a-b) typical areas in which old structures and/or infrastructure has not been cleared or rehabilitated, c) areas cleared for parking lots

Secondary Thornveld Habitat

- This habitat unit comprises the largest extent of the study area (approximately 15 ha).
- The Secondary Thornveld habitat is associated with a poor floristic diversity and is typically characterised by vegetation communities that are dominated by encroaching *Dichrostachys cinerea* and *Vachellia tortilis* subsp. *heteracantha*.
- Overall, the Secondary Thornveld habitat unit was characterised by an encroaching tree layer with a sparse grass layer – although scattered areas were characterised by bare soils because of overgrazing.
- The associated floral communities have historically been impacted by cultivation, subsistence farming, and bush clearing.
- Currently, the vegetation is impacted by heavy grazing from both cattle and goats. Vegetation clearing, trenching and subsequent dumping of cleared vegetation was apparent throughout the habitat unit.
- The informal farming and associated transformation of the habitat occurred less than 10 years ago, which means that the current vegetation within the Secondary Thornveld Habitat does not meet the definition of indigenous vegetation as per the NEMA Listing Notices (LNs).
- Although the habitat unit has recovered somewhat, the alteration in fire and herbivory regimes and the residual impacts from historic activities (e.g., subsistence farming etc), have resulted in a habitat that is no longer being considered representative of the reference vegetation type, i.e., the Makhado Sweet Bushveld.



Figure 10-10: Photographs illustrating the landscape associated with the Secondary Thornveld Habitat Unit: a) typical landscape (with encroaching woody species in the background) associated

Species of conservation concern

- No TOPS species or species as listed under the Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA) were observed during the field assessment.
- Two protected tree species as per the National Forest Act, 1998 (Act No. 84 of 1998) (NFA), namely *Sclerocarya birrea* subsp. *caffra* and *Ealeodendron transvaalense* (near-threatened (NT)), were identified within the study area.

Figure 10-11: Photographs of plant species recorded within the study area: a) *Sclerocarya birrea* subsp. *caffra* (a NFA woody species recorded within the Secondary Thornveld Habitat), b) *Gossypium herbaceum* subsp. *africanum* (an infrequently recorded woody species within the Secondary Thornveld Habitat), c) *Aloe marlothii* (a succulent species recorded within the study area), and d) *Delonix regia* (an AIP species recorded in the study area where historic houses used to be).

Alien and Invasive Plant (AIP) Species

A total of 10 AIP species were recorded within the study area. The density of AIPs within the study area varied; overall the Heavily Degraded Habitat supported higher density of AIPs.

Sensitivity

- The Screening Tool identified the study area to be in a low sensitivity area for the Plant Species Theme and a very high sensitivity area for the Terrestrial Biodiversity Theme.
- A low habitat sensitivity is associated with the heavily Degraded Habitat Unit
- A moderately low sensitivity is associated with the Secondary Thornveld Habitat

Scientific Name	Common Name	Origin	NEMBA Category	Secondary Thornveld	Heavily Degraded Areas
Woody Species					
<i>Delonix regia</i>	Flamboyant	Madagascar	NL	x	x
<i>Plumeria Rubra</i>	Frangipani	Central America	NL	x	x
<i>Tecoma stans</i>	Yellow bells	Mexico & Southern USA	1b		x
Herbaceous Species					
<i>Bidens pilosa</i>	Blackjack	South & Central America	NL	x	x
<i>Gomphrena celosioides</i>	Bachelor's Button	South America	NL		x
<i>Schkuhria pinnata</i>	Dwarf Mexican Marigold	Central America	NL	x	x
<i>Solanum elaeagnifolium</i>	Silver-leaf bitter apple	Southern USA	1b	x	x
<i>Tagetes minuta</i>	Kaki bos	South & Central America	NL	x	x
Succulent Species					
<i>Agave sisalana</i>	Sisal	Central America	2	x	x
Graminoid Species					
<i>Pennisetum setaceum</i>	Fountain grass	East Africa	1b		x

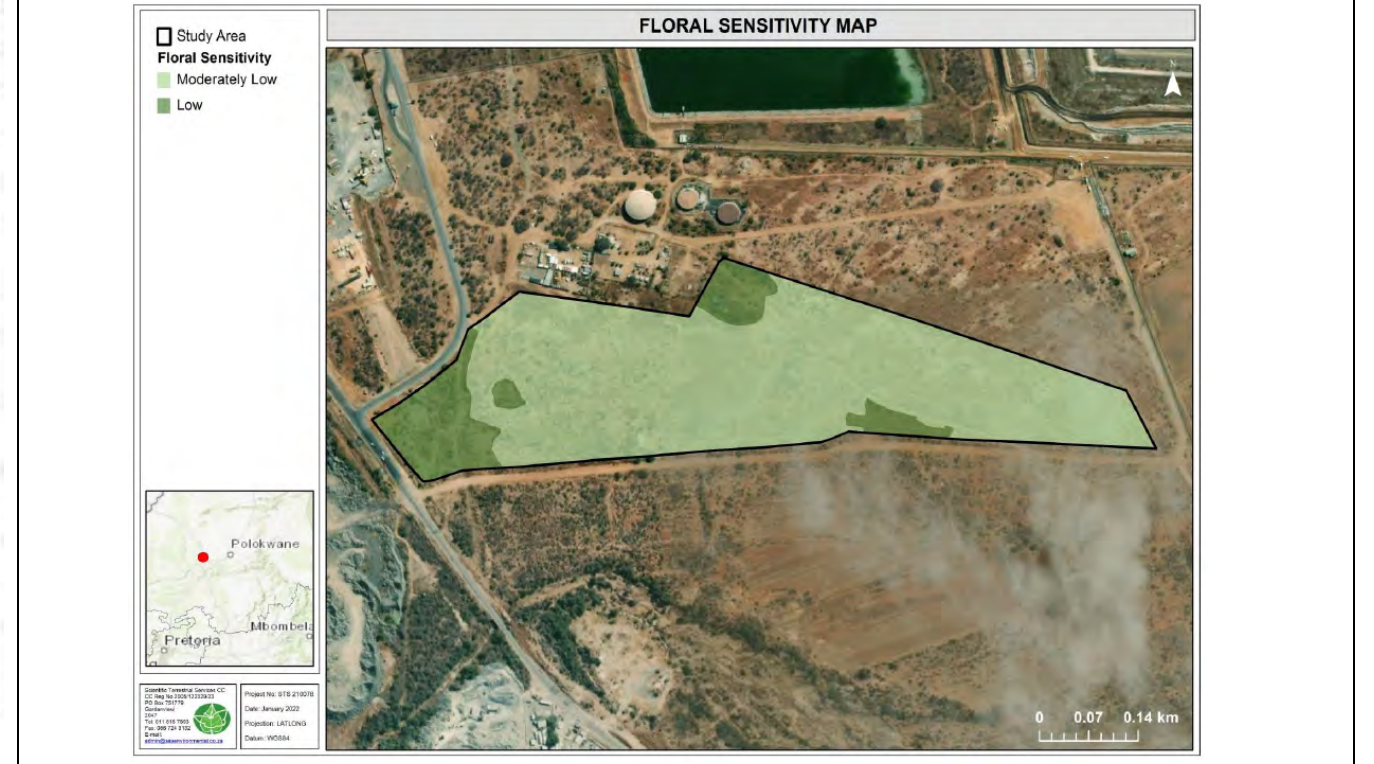


Figure 10-12: Floral sensitivity associated with the study area on a macroscale

Impact

With no indigenous vegetation present within the study area, the proposed project will not impact on indigenous vegetation (refer to Section 11 for an assessment of the potential impacts)

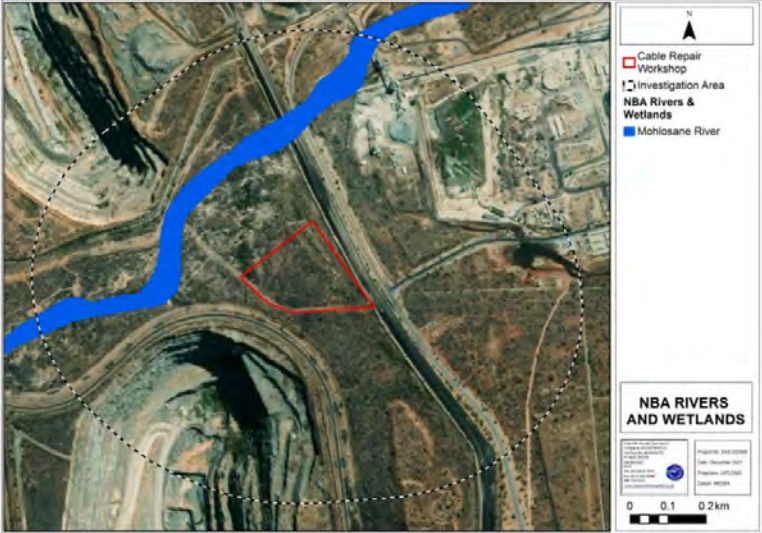
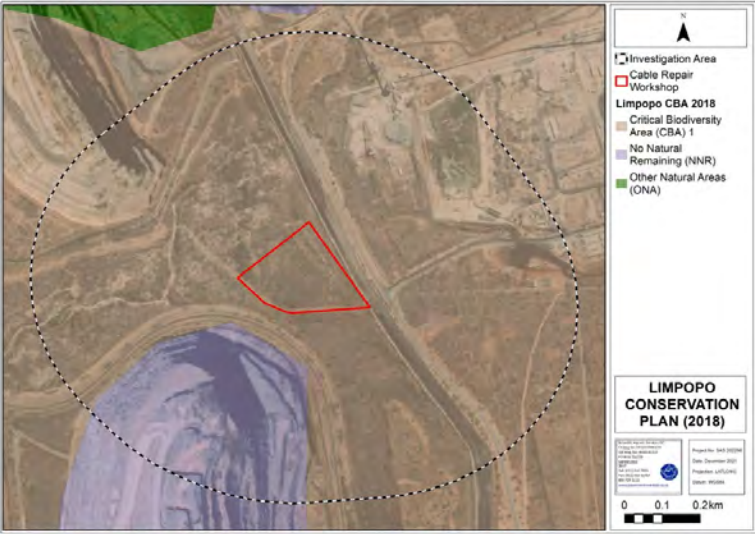
10.7 Freshwater ecosystem assessment

The information presented in this section has been extracted from the Freshwater Ecosystem Assessment compiled by Scientific Aquatic Services in 2022 (Appendix E).

Scientific Aquatic Services CC (SAS) was appointed to conduct a Freshwater Ecosystem assessment as part of the BA Environmental Authorisation process for the proposed pre-assembly yard and cable yard areas. A summary of the freshwater ecosystem baselines is presented in Table 10-7 and Table 10-8 for the proposed cable yard and pre-assembly yard areas respectively.

Table 10-7: Freshwater ecosystem baseline of the proposed cable yard area

Desktop freshwater ecosystem characteristics	
Aquatic ecoregion and sub-regions	
Ecoregion	Limpopo Plain
Catchment	Limpopo
Quaternary Catchment	A61G
Water Management Area (WMA)	Limpopo
Sub-water Management Area (SubWMA)	Mogalakwena
Ecological status of the most proximal sub-quaternary reach (DWS, 2014)	
Sub-quaternary reach	A61G – 00266 Groot Sandslot River (7.95 km south west of the study area). No data is contained in the database for the Mohlosane River
PES Category Median	Class E (Seriously Modified)
Stream Order:	1
Mean Ecological Importance (EI) Class	Moderate
Mean Ecological Sensitivity (ES) Class	Very Low
Default Ecological Class (based on median PES and highest EI or ES mean)	Class C (Moderately Modified)
Strategic Water Source Area for Surface water (SWSA) (2017)	The study area does not fall within a SWSA
Detail of the study areas in terms of the National Freshwater Ecosystem Priority Area (NFEPAs) (2011) database	
FEPA CODE	The study area falls within an area defined as a National Freshwater Ecosystem Priority (FEPA) Code 4 catchment. Code 4 River FEPAs are important Upstream Management Catchment Areas. Upstream Management Areas are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas. Upstream Management Areas do not include management areas for wetland FEPAs, which need to be determined at a finer scale
NFEPAs Wetlands and Rivers	No wetlands and rivers are indicated by the NFEPAs database within the study areas, nor within the investigation area

<p>Wetland vegetation Type</p>	<p>The majority of the study area falls within the Makhado Sweet Bushveld (Central Bushveld Group 4) Wetland Vegetation Type which is considered Vulnerable (VU) and hardly protected (Mbona <i>et al</i>, 2015)</p>
<p>National Biodiversity Assessment (NBA) (2018): South African Inventory of Inland Aquatic Ecosystems (SAIIAE):</p> <p>A dam and an open reservoir were identified within the investigation area according to the NBA (2018): SAIIAE artificial features Database (Figure 10-13). The Mohlosane River was identified by the NBA Wetlands Database within the investigation area.</p>	 <p>Figure 10-13: Hydrogeomorphic (HGM) unit indicated by the National Biodiversity Assessment (NBA) (2018) relative to the study and investigation areas</p>
<p>Detail of the study areas in terms of the Limpopo Conservation Plan (2018):</p> <p>The study and investigation area are defined as a Category 1 CBA (Figure 10-14). These are “Irreplaceable” areas, which are required to meet biodiversity pattern and/or ecological processes targets; and with no alternative sites available to meet targets. The remaining portion of the study area is defined as No Natural Remaining (NNR).</p>	 <p>Figure 10-14: Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) associated with the study and investigation areas according to the Limpopo Conservation Plan.</p>
<p>Importance of the study area according to the Mining and Biodiversity Guidelines (2013)</p>	<p>The study area falls within an area considered to be of High Biodiversity Importance. High Biodiversity Importance areas include areas where mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations</p>
<p>Freshwater Ecosystem Characterisation</p>	
<p>Freshwater Ecosystem</p>	<p>Mohlosane River</p>

Level 3: Landscape unit	Valley floor: The base of a valley, situated between two distinct valley side-slopes
Level 4: HGM Type	River: A linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include both the active channel and the riparian zone as a unit

Freshwater Ecosystem Delineation

The delineated extent of the Mohlosane River associated with the study area is depicted in the figure below.



Figure 10-15: The location of the reach of the Mohlosane River associated with the study and investigation areas.

Assessment of the reach of the Mohlosane River associated with the proposed cable yard area

IHI and VEGRAI discussion (Riparian IHI Category: C and VEGRAI Category: C)	The assessed reach of the Mohlosane River has been modified as a result of surrounding mining activities, including various road crossings, probable inputs of stormwater from impermeable surfaces and increased inputs of sediment and nutrients (evidenced by dense stands of <i>Phragmites australis</i> and <i>Typha capensis</i> in the eastern portions of the reach, closest to mining activities). Additionally, bank erosion was noted on site and on digital satellite imagery, contributing to increased sediment loads as well as altering channel competency and geomorphological processes.
EIS discussion (EIS Category: Moderate)	The Mohlosane River is ecologically important for its contribution to the recharge and ecological functioning of the Mogalakwena River, which is a major tributary of the Limpopo River. It also provides important breeding and foraging habitat for various faunal species as well as acting as a faunal migratory corridor, providing connectivity between remaining open spaces in the area. It is seasonally important for the provision of water to downstream users for domestic purposes including livestock watering.
Ecoservice provision (moderately low / very low)	Ecological service provisioning by the assessed reach of the river is limited by the seasonal availability of water. It is, nevertheless considered important for the provision of key services such as flood attenuation, streamflow regulation, nutrient and toxicant assimilation, sediment trapping and biodiversity maintenance.
REC, RMO & BAS Category (REC: C/D BAS: C)	The ecological integrity of the Mohlosane River should not be permitted to degrade further, and all efforts should be made to ensure that minimal cumulative impacts occur.

RMO: Maintain)



Figure 10-16: Representative photographs of the reach of the Mohlosane River associated with the proposed project illustrating relatively robust vegetation cover

Freshwater ecosystem drivers and receptors discussion (hydraulic regime, geomorphological processes, water quality and habitat and biota):

- The Mohlosane River is a non-perennial system and as such is largely reliant on precipitation and surface water inflows. Although not quantified, loss of catchment yield is likely due to the expansion of mining activities in the upstream catchment, in particular the Blinkwater Tailings Storage Facility (TSF) which likely captures much of the precipitation that would have historically contributed to recharge of the Mohlosane River; however, the increased area of impermeable surfaces may counteract the loss. Compounding this are various road crossings which impact on the distribution of water when present within the river. Within the assessment area, i.e., the portion of land between the river and the study area, historical mining activities have altered the topography which in turn has altered the pattern, timing and movement of water through the landscape, potentially impacting recharge of the river.
- Geomorphological processes have been modified as a result of historical agricultural and mining activities as well as current mining activities which have evidently contributed to increased sediment loads entering the river, changing bed characteristics and potentially contributing to the bank incision observed during the site assessment. Soil in the area is naturally susceptible to erosion, but the erosive process is exacerbated by anthropogenic activities, also contributing to increased sediment loads.
- As water was present at the time of assessment, basic water quality parameters were recorded. The pH was slightly elevated at 8.19 but can nevertheless be considered 'natural'. Electrical Conductivity at the assessment site was 216mS/cm, which is elevated from natural conditions and is likely attributable to the prevalence of mining activities in the catchment.
- The reasonably diverse and robust riparian zone and instream vegetation provides suitable breeding and foraging habitat for a number of faunal species, particularly less sensitive avifauna, reptiles, amphibians and small mammals, although only avifauna was observed at the time of assessment. Whilst the occurrence of aquatic biota is limited because of the non-perennial nature of the system, aquatic macroinvertebrates were observed.

Extent of modification anticipated

As the study area is situated outside of the applicable zones of regulation associated with the river in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Government Notice 509 as published in the Government Gazette 40229 of 2016 and Government Notice 704 Regulations as published in the Government Gazette 20119 of 1999 as they relate to the National Water Act, 1998 (Act No. 36 of 1998) no direct impacts or modification are anticipated.

Impact

Although direct impacts associated with the proposed activities within the study area are unlikely owing to the distance between the freshwater ecosystems and the study area, mitigation measures as stipulated in Section 11 are strongly recommended to prevent indirect impacts.

Table 10-8: Freshwater ecosystem baseline of the proposed pre-assembly yard area

Desktop freshwater ecosystem characteristics	
Aquatic ecoregion and sub-regions	
Ecoregion	Limpopo Plain
Catchment	Limpopo
Quaternary Catchment	A61G
Water Management Area (WMA)	Limpopo
Sub-water Management Area (SubWMA)	Mogalakwena
Ecological status of the most proximal sub-quaternary reach (DWS, 2014)	
Sub-quaternary reach	A61G – 00266 Groot Sandsloot River (6.5 km south west of the study area)
PES Category Median	Class E (Seriously Modified)
Stream Order:	1
Mean EI Class	Moderate
Mean ES Class	Very Low
Default Ecological Class (based on median PES and highest EI or ES mean)	Class C (Moderately Modified)
SWSA (2017)	The study area does not fall within a SWSA
Detail of the study areas in terms of the NFEPA (2011) database	
FEPA CODE	The study area falls within an area defined as a FEPA Code 4 catchment. Code 4 River FEPAs are important Upstream Management Catchment Areas. Upstream Management Areas are sub-quaternary catchments in which human activities need to be managed to prevent degradation of downstream river FEPAs and Fish Support Areas. Upstream Management Areas do not include management areas for wetland FEPAs, which need to be determined at a finer scale.
NFEPA Wetlands and Rivers	No natural or artificial wetlands are indicated by the NFEPA database within the study area or within the investigation area. The Groot Sandsloot River is indicated by the database approximately 400 m south of the study area, although the closest field delineated reach is approximately 165 m from the study area.
Wetland vegetation Type (NBA) (2018): SAIIE An open reservoir was identified within the investigation area according to the NBA (2018): SAIIE artificial features database. The Groot Sandsloot River is located 400 m south of the study area. No natural wetlands were identified by the database.	The majority of the study area falls within the Central Bushveld Group 4 Wetland Vegetation Type which is considered Vulnerable (VU) and poorly protected (Mbona <i>et al</i> , 2015).

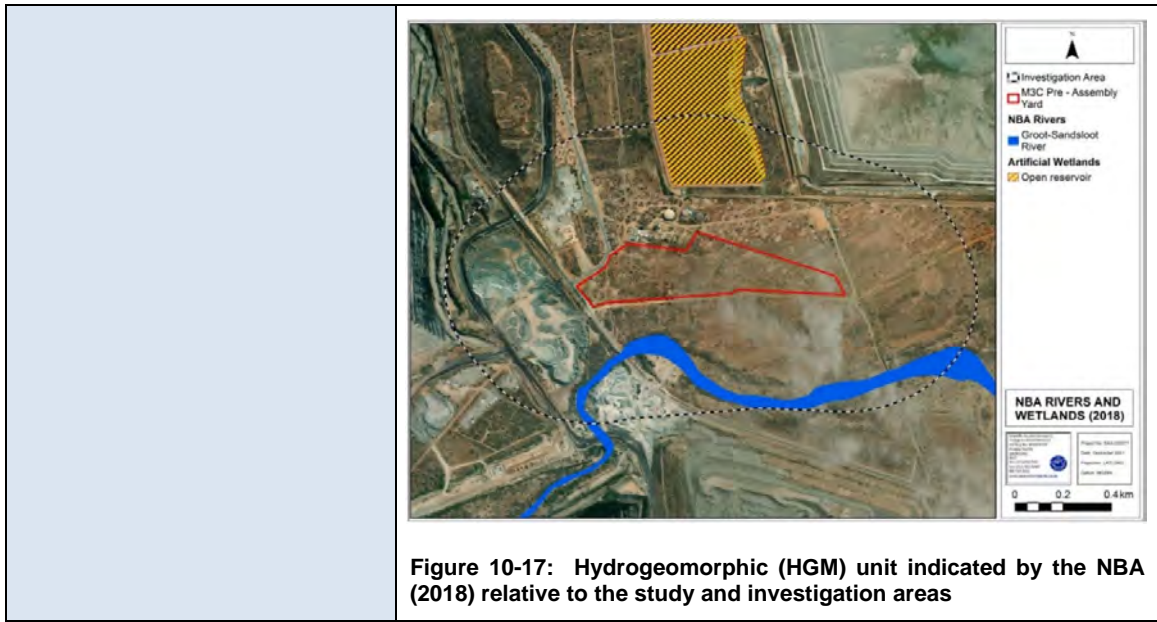


Figure 10-17: Hydrogeomorphic (HGM) unit indicated by the NBA (2018) relative to the study and investigation areas

Detail of the study areas in terms of the Limpopo Conservation Plan (2018):

The study area and the majority of the investigation area are defined as a Category 1 CBA. These are “Irreplaceable” areas, which are required to meet biodiversity pattern and/or ecological processes targets; and with no alternative sites available to meet targets. The remaining portions of the investigation area are defined as Other Natural Areas, Ecological Support Areas 2, and No Natural Remaining (NNR).

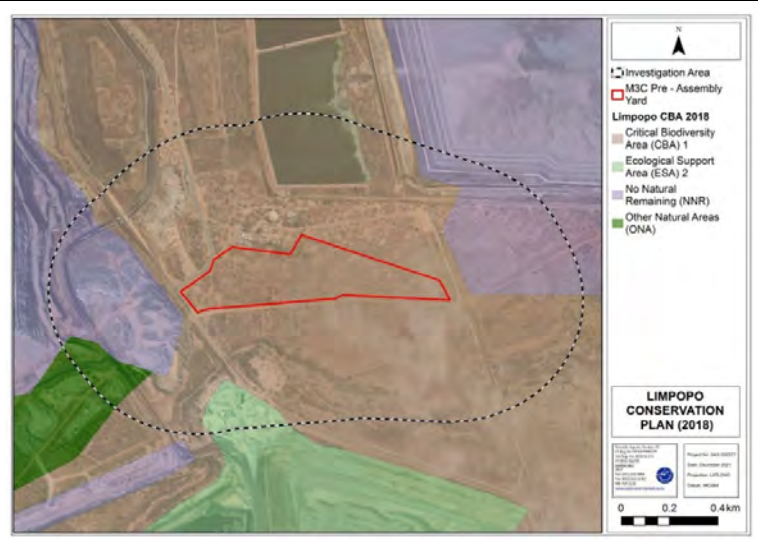


Figure 10-18: CBAs and ESAs associated with the study and investigation areas according to the Limpopo Conservation Plan.

Importance of the study area according to the Mining and Biodiversity Guidelines (2013)

The study area falls within an area considered to be of High Biodiversity Importance. High Biodiversity Importance areas include areas where mining options may be limited in these areas, and red flags for mining projects are possible. Authorisations may set limits and specify biodiversity offsets that would be written into licence agreements and/or authorisations.

Freshwater Ecosystem Characterisation

Freshwater Ecosystem

Groot Sandsloot River

Level 3: Landscape unit

Valley floor: The base of a valley, situated between two distinct valley side-slopes.

Level 4: HGM Type	River: A linear landform with clearly discernible bed and banks, which permanently or periodically carries a concentrated flow of water. A river is taken to include both the active channel and the riparian zone as a unit.
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Freshwater Ecosystem Delineation

The delineated extent of the Groot Sandsloot River associated with the study area is depicted in the figure below.

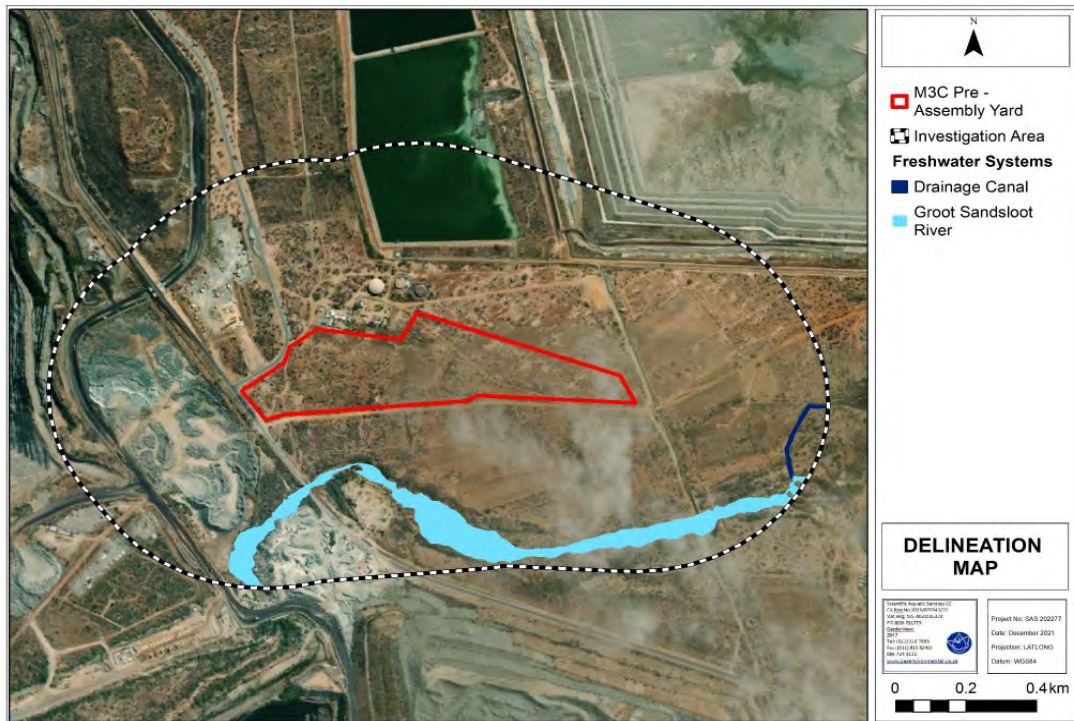


Figure 10-19: The location of the reach of the Groot Sandsloot River associated with the proposed project.

Assessment of the reach of the Mohlosane River associated with the proposed cable yard area

IHI and VEGRAI discussion (Riparian IHI Category: C/D and VEGRAI Category: C)	The riparian zone has been modified in various ways. The large impoundment to the east of the study area has resulted in loss of recharge to the downstream reach (i.e. the reach associated with the investigation area) which in turn has led to reduced recruitment of riparian vegetation. Additionally, the upper portion of the assessed reach (i.e. the eastern portion) is characterised by bank incision, and what appears to be historical indiscriminate disposal of soil, resulting in altered topography. The lower (western) portion of the reach has been altered by mining activities and the low-level crossing of Bakenberg Road.
EIS discussion (EIS Category: Moderate)	The Groot Sandsloot River is one of the primary drainage systems of the area, and is a major tributary of the Mogalakwena River, located approximately 8.5 km south-west of the study area which in turn is a major tributary of the Limpopo River. Therefore, the river is considered ecologically important for its contribution to the ecological functioning of the downstream system, although its capacity to do so has been compromised. It is also considered important as a faunal migratory corridor, providing connectivity between the remaining natural areas outside of the various mining activities in the area.
Ecoservice provision (moderately low / very low)	As a non-perennial system, ecological service provision is decreased as delivery of key ecoservices is reliant on the presence of water. Nevertheless, the assessed reach of the river is considered important in terms of sediment trapping, harvestable resources (e.g. firewood) and biodiversity maintenance. It may be seasonally important for the provision of water, however local communities are unlikely to be reliant on it for recreation, tourism, or education particularly given the proximity of mining operations.

REC, RMO & BAS Category (REC: C/D BAS: C RMO: Maintain)	Direct impacts associated with the proposed project are not anticipated, therefore maintaining the PES and EIS of the reach of the Groot-Sandsloot associated with the study area is feasible. Any future projects within the regulated zones around the river must however be assessed on an individual basis to ensure that such activities do not impact on the river.
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Figure 10-20: Representative photographs of the reach of the Groot Sandsloot River associated with the proposed project, illustrating the weakly-defined riparian zone in the portion east of the study area (left) whilst to the west of the study area the riparian zone is more distinctly formed.

Freshwater ecosystem drivers and receptors discussion (hydraulic regime, geomorphological processes, water quality and habitat and biota):

- The primary modifier of the hydraulic regime of the river is the DWS Vaalkop No. 2 Dam situated to the east of the study and investigation areas as this has prevented flow from reaching the downstream reaches of the river, potentially exacerbating the naturally non-perennial conditions particularly in terms of the composition and structure of the associated riparian zone. Although an earthen canal has been created to channel water from the dam into the river downstream of the impoundment, the outlet of this channel could not be located during the site visit and does not appear to be effective. The remains of historical agricultural furrows were also noted, but these no longer appear to be functional and therefore no longer impact on the hydraulic functioning of the river.
- The geomorphological processes have similarly been affected by anthropogenic activities, in particular increased sediment inputs due to airborne dust from surrounding mining activities, and disturbances to soil caused by increased vehicular and foot traffic within the catchment. During the site assessment, several herds of domestic livestock were observed within the study area and along the Groot Sandsloot River; the concentration of these animals in a relatively small area has led to overgrazing and trampling, contributing to the overall disturbance of soil and absence of protective vegetative cover.
- The river was dry at the time of assessment, and thus water quality parameters could not be determined. It is likely that when present, surface water quality is impaired due to the various disturbances in the catchment including increased availability of toxins and hydrocarbons from general vehicular traffic in the catchment, as well as sediment.
- Despite the decreased ecological integrity of the river, it nevertheless provides suitable breeding and foraging habitat for less sensitive faunal species as well as providing an important migratory corridor between the remaining open spaces. The riparian zone predominantly comprised indigenous woody species albeit dominated by *Dichrostachys cinerea*, potentially an indication of disturbance and bush encroachment.

Extent of modification anticipated

Although the identified watercourse is situated within the 500 m investigation area, the study area is located outside the applicable zones of regulation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), Government Notice 509 as published in the Government Gazette 40229 of 2016 and Government Notice 704 Regulations as published in the Government Gazette 20119 of 1999 as they relate to the National Water Act, 1998 (Act No. 36 of 1998) (please refer to Section 5 for details). Therefore, no direct impacts to the river relating to the proposed activities within the study area are anticipated. However, the study area is situated slightly upgradient of the river, and therefore indirect impacts such as increased inputs of water may potentially occur. Provided that appropriate mitigation measures are implemented throughout the life of the proposed project, particularly during the operational phase, the extent of modification anticipated is likely to be negligible to low and no fragmentation of the watercourse is anticipated.

Impact

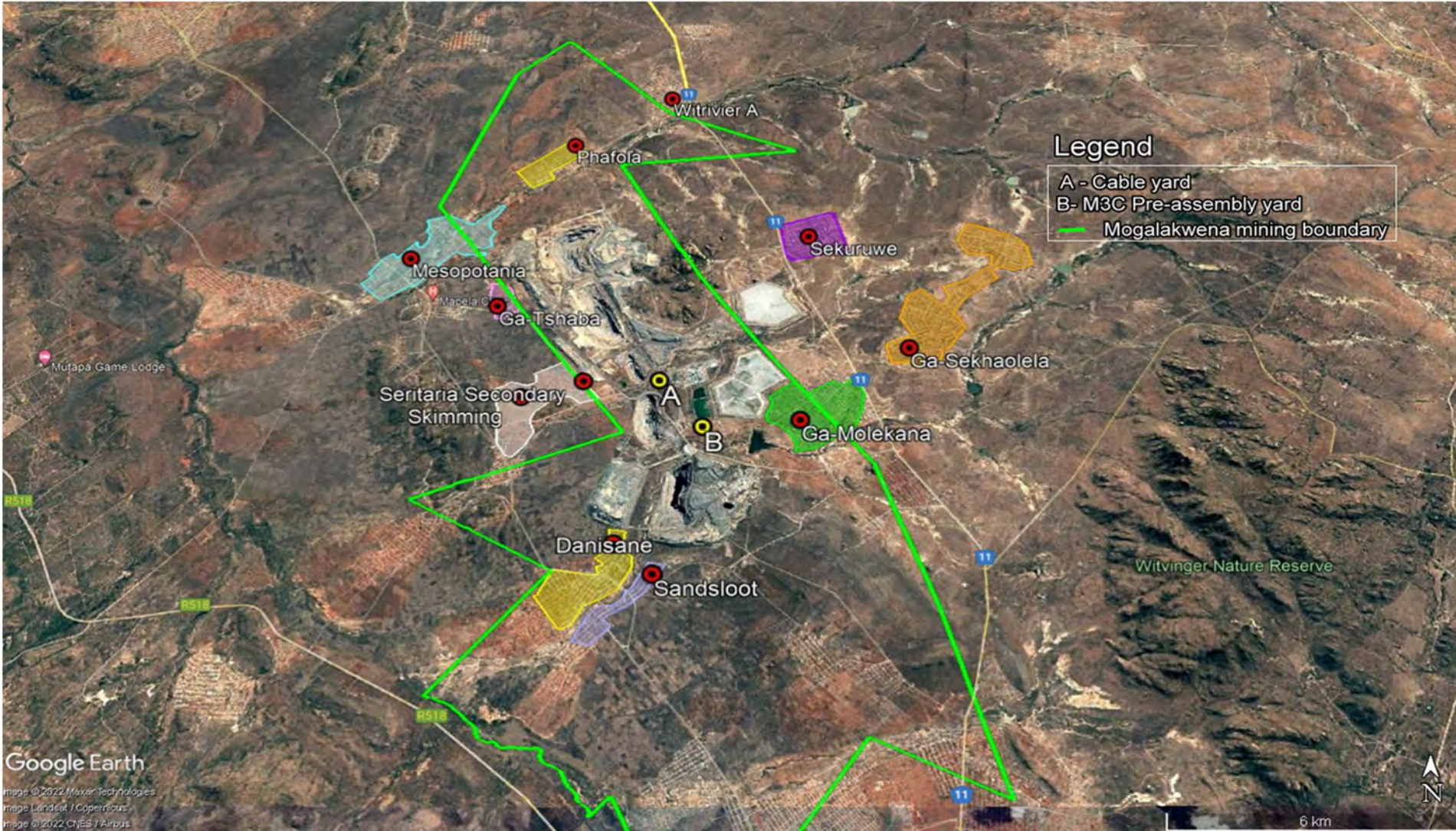
Although direct impacts associated with the proposed activities within the study area are unlikely owing to the distance between the freshwater ecosystems and the study area, mitigation measures as stipulated in Section 11 are strongly recommended to prevent indirect impacts.

10.8 Noise

The information presented in this section has been extracted from the Noise specialist study compiled by dBAcoustics in 2022 (Appendix E).

A noise survey was conducted for the proposed pre-assembly yard and cable yard projects in on 7 and 8 December 2021. The noise data have been used to determine the potential noise impacts into the abutting residential areas which are the Seritarita Secondary School, Ga-Masanya/Skimming, Danisane, Sandsloot, and Ga-Molekana. These habitable areas are all within a radius of 5 342m from the project areas. The two projects will take place in an area where there are other mining activities and feeder roads with a continuous flow of traffic during the day and intermittent traffic flow during the night.

Table 10-9: Noise baseline

Baseline aspect	Baseline summary	Table/Map/illustration to support baseline summary																				
<p>Current noise sources</p>	<p>Existing mining activities (north and south concentrator), opencast activities, traffic (inside the mining area), traffic along the N11 and feeder road between the N11 and the western communities, seasonal agricultural activities, domestic activities all contributes to the prevailing ambient noise levels depending on the distance the residential area is to the existing mining activities. The communities within the vicinity of the proposed project areas are indicated in Figure 10-21.</p> <p>The prevailing ambient noise levels in the vicinity of Seritaria Secondary School, Ga-Mosenyana/Skimming, Danisane, Sandsloot and Ga-Molekana were as follows:</p> <ul style="list-style-type: none"> • Seritaria Secondary School – Daytime 39.0dBA and night-time 44.6dBA; • Ga-Mosenyana/Skimming – Daytime 39.8dBA and night-time 39.0dBA; • Danisane – Daytime 40.1dBA and night-time 45.1dBA; • Sandsloot - Daytime 38.6dBA and night-time 43.5dBA; • Ga-Molekana – Daytime 43.0dBA and night-time 44.5dBA; • Mining area in the vicinity of Bakenberg Road – Daytime 49.5dBA and night-time 48.6dBA. 	 <p>Figure 10-21: Communities in the vicinity of the proposed project areas (A = Cable yard area and B = Pre=assembly yard area)</p>																				
<p>Sensitive receptors</p>	<p>The closest community to the proposed project sites is the Seritia secondary school placed 1381 m away from the proposed cable yard location. Table 10-10 provides the distances between all of the abutting communities and the proposed project areas.</p>	<p>Table 10-10: Distances between the project areas and the communities</p> <table border="1" data-bbox="988 1440 2763 1858"> <thead> <tr> <th rowspan="2">Communities</th> <th colspan="2">Distance between the different project areas and the abutting communities in meters</th> </tr> <tr> <th>Cable yard (A)</th> <th>Pre-assembly yard (B)</th> </tr> </thead> <tbody> <tr> <td>Seritaria Secondary School</td> <td>1 381</td> <td>2 419</td> </tr> <tr> <td>Ga-Masenyana/Skimming</td> <td>1 932</td> <td>3 040</td> </tr> <tr> <td>Danisane</td> <td>4 321</td> <td>3 485</td> </tr> <tr> <td>Sandsloot</td> <td>5 234</td> <td>3 963</td> </tr> <tr> <td>Ga-Molekana</td> <td>3 031</td> <td>1 519</td> </tr> </tbody> </table>	Communities	Distance between the different project areas and the abutting communities in meters		Cable yard (A)	Pre-assembly yard (B)	Seritaria Secondary School	1 381	2 419	Ga-Masenyana/Skimming	1 932	3 040	Danisane	4 321	3 485	Sandsloot	5 234	3 963	Ga-Molekana	3 031	1 519
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Sandsloot	5 234	3 963																				
Ga-Molekana	3 031	1 519																				

Noise survey

The results of the noise survey conducted on 7 and 8 December 2021 were used to determine the potential noise impact at the different communities in the vicinity of the mining right boundaries.

Noise measurements were taken at 11 points throughout the study areas (Figure 10-22) during the day and night time.

The prevailing ambient noise levels are recorded in Table 10-11 provide an indication of the noise sources currently present in the area which include domestic, traffic noise, distant mine noise and natural noise sources.

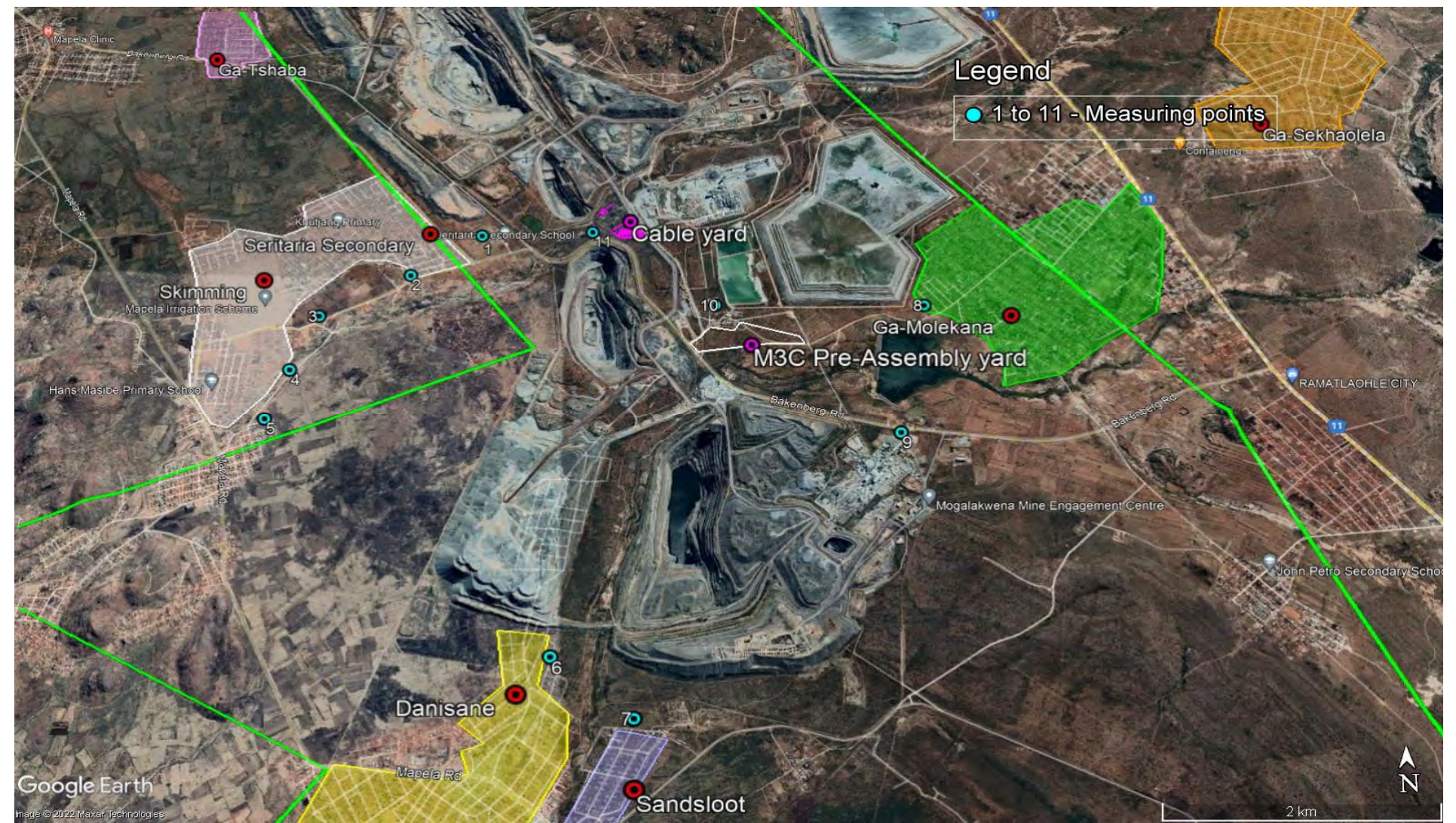


Figure 10-22: Noise measuring points within the proposed project areas (A = Cable yard area and B = Pre-assembly yard area)

Table 10-11: Noise levels for day and night in the study area

Measuring point	Daytime				Night 1				Night 2			
	LAeq-dBA	Lmax - dBA	Lmin - dBA	Remarks	LAeq- dBA	Lmax - dBA	Lmin - dBA	Remarks	LAeq-dBA	Lmax - dBA	Lmin - dBA	Remarks
1	39.0	54.0	29.8	Distant mining and traffic	44.8	56.4	37.7	Distant mining	44.2	55.6	37.2	Distant mining
2	39.7	55.0	31.1	Distant mining and domestic	37.6	49.6	31.9	Distant mining	40.1	52.7	34.0	Distant mining
3	39.1	49.6	32.3	Distant mining	40.1	48.2	30.0	Distant mining	39.8	48.2	30.7	Distant mining
4	36.3	56.5	26.7	Distant mining and traffic	40.9	52.3	34.0	Distant mining	39.4	51.8	33.6	Distant mining
5	44.1	52.2	37.9	Domestic and distant mining activities audible.	38.4	50.2	32.3	Domestic and distant mining activities audible	35.9	46.7	31.1	Distant domestic and insects.

6	40.1	56.7	24.8	Distant animals, birds, and domestic noise	40.0	46.4	36.5	Domestic, mining and insects.	50.1	67.4	38.7	Distant mining and insects.
7	38.6	55.7	24.9	Domestic and birds.	42.0	53.8	33.6	Domestic and insects	44.9	57.1	38.0	Distant mining and insects
8	43.0	54.5	33.5	Distant mining.	44.8	61.8	33.1	Distant mining and insects.	44.1	52.2	37.9	Distant mining and insects.
9	54.3	67.4	38.7	Traffic and distant mining activities	50.1	66.7	37.7	Traffic and mining activities	54.2	59.6	46.0	Traffic and distant mining.
10	48.1	59.2	40.4	Distant hauling and mining.	50.1	59.9	39.7	Distant hauling and mining.	47.8	60.1	40.5	Distant mining and traffic.
11	46.1	58.0	38.1	Distant mining activities.	44.3	56.5	36.9	Distant mining activities.	44.9	57.1	38.0	Distant mining activities.

Calculated noise intrusion levels during construction and operation

Sound levels were used in determining the noise intrusion level for the project during the phases of the proposed project. The criteria for assessing the magnitude of a noise impact are illustrated in the table below:

Increase Δ-dBA	Assessment of impact magnitude	Color code
0 <Δ≤ 1	Not audible	Green
1 <Δ≤ 3	Very Low	Blue
3 <Δ≤ 5	Low	Yellow
5 <Δ≤ 10	Medium	Orange
10 <Δ≤ 15	High	Red
15 <Δ	Very High	Dark Red

The specialist reported that noise intrusion levels during the construction and operational phase of the cable yard will be below the threshold value of 7.0dBA. The noise from the proposed project activities will not be audible at the abutting noise receptors due to the existing mining activities at Mogalakwena Complex

In terms of the Noise Regulations, a noise disturbance is created when the prevailing ambient noise level is exceeded by 7.0dBA or more. The noise intrusion levels for both the pre-assembly yard and cable yard areas during the construction and operations phases are shown in Table 10-12 to Table 10-17.

Cable yard (Area A on the map)

Table 10-12: Calculated noise intrusion levels during the construction phase – Clearing of footprint at the proposed cable yard area

Position	Clearing and stripping of topsoil	Earthworks	Digging of trenches and foundation	Construction of roads	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	22.7	22.7	20.7	22.7	26.3	28.3	39.1	0.1	0.0
Ga-Masenya/Skimming	19.8	19.8	17.8	19.8	23.4	25.4	39.8	0.0	0.0
Danisane	12.8	12.8	10.8	12.8	16.8	18.6	40.1	0.0	0.0
Sandsloot	11.1	11.1	9.1	11.1	15.4	17.1	38.6	0.0	0.0
Ga-Molekana	15.9	15.9	13.9	15.9	19.7	21.6	43.0	0.0	0.0

Table 10-13: Calculated noise intrusion levels during the construction phase – Construction of buildings at the proposed cable yard area

Position	Deliveries of construction material	Delivery of material for construction of buildings	Assembling erecting buildings	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	20.7	22.7	20.7	20.2	35.4	36.4	0.1	0.1

Ga-Masenya/Skimming	17.8	19.8	17.8	23.9	35.6	36.5	0.3	0.2
Danisane	10.8	12.8	10.8	22.8	35.5	36.5	0.2	0.2
Sandsloot	9.1	11.1	9.1	23.1	45.7	45.0	0.0	0.0
Ga-Molekana	13.9	15.9	13.9	25.6	45.7	45.0	0.0	0.0

Table 10-14: Noise intrusion levels for the operational phase of the cable yard

Position	Cable yard	Compressors	Cable bay	Vehicles	Parking Bay	Administrative building	Extract fans	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	25.2	25.2	25.7	25.7	5.7	7.7	17.8	26.5	39.2	44.7	0.2	0.1
Ga- Masenya/ Skimming	22.3	22.3	22.8	22.8	2.8	4.8	15.8	23.8	39.9	39.1	0.1	0.1
Danisane	15.3	15.3	15.8	15.8	-4.2	-2.2	14.7	18.7	40.1	45.1	0.0	0.0
Sandsloot	13.6	13.6	14.1	14.1	-5.9	-3.9	13.5	17.4	38.6	43.5	0.0	0.0
Ga-Molekana	18.4	18.4	18.9	18.9	-1.1	0.9	21.9	23.8	43.1	44.5	0.1	0.0

The specialist reported that noise intrusion levels during the construction and operational phase of the pre-assembly yard will be below the threshold value of 7.0dBA. The noise from the proposed project activities will not be audible at the abutting noise receptors due to the existing mining activities at Mogalakwena Complex

Pre-assembly yard (Area B on the map)

Table 10-15: Calculated noise intrusion levels during the construction phase – clearing of footprint at the proposed pre-assembly yard area

Position	Clearing and stripping of topsoil	Earthworks	Digging of trenches and foundation	Construction of roads	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	17.8	17.8	15.8	15.8	23.0	39.0	44.6	0.0	0.0
Ga-Masenya/Skimming	15.8	15.8	13.8	13.8	21.1	39.8	39.0	0.0	0.0
Danisane	14.7	14.7	12.7	12.7	20.0	40.1	45.1	0.0	0.0
Sandsloot	13.5	13.5	11.5	11.5	18.9	38.6	43.5	0.0	0.0
Ga-Molekana	21.9	21.9	19.9	19.9	27.0	43.0	44.5	0.0	0.0

Table 10-16: Calculated noise intrusion levels during the construction phase – construction of buildings at the proposed pre-assembly yard area

Position	Deliveries of construction material	Delivery of material for construction of buildings	Assembly/erecting buildings	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	15.8	14.5	16.0	20.5	39.1	44.6	0.1	0.0
Ga-Masenya/Skimming	13.8	14.5	14.0	19.2	39.8	39.0	0.0	0.0
Danisane	12.7	16.9	12.9	19.6	40.1	45.1	0.0	0.0
Sandsloot	11.5	14.6	11.7	18.0	38.6	43.5	0.0	0.0
Ga-Molekana	19.9	14.8	20.1	23.7	43.1	44.5	0.1	0.0

Table 10-17: Noise intrusion levels for the operational phase of the pre-assembly yard

Position	Pre-assembly yard	Compressors	Cranes	Vehicles	Mobile generators	Extract fans	Administrative buildings	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level – Night-time	Intrusion noise level - daytime	Intrusion noise level - night-time
Seritaria Secondary School	25.2	26.2	25.7	15.7	30.7	15.7	5.8	31.0	39.6	44.8	0.6	0.2
Ga-Masenya/Skimming	22.3	23.3	22.8	12.8	27.8	12.8	3.8	28.1	40.1	39.3	0.3	0.3
Danisane	15.3	16.3	15.8	5.8	20.8	5.8	2.7	21.3	40.2	45.1	0.1	0.0
Sandsloot	13.6	14.6	14.1	4.1	19.1	4.1	1.5	19.7	38.7	43.5	0.1	0.0
Ga-Molekana	18.4	19.4	18.9	8.9	23.9	8.9	9.9	24.4	43.1	44.5	0.1	0.0

Impact

The environmental noise impact during the construction/development phase will be insignificant and during the operational phase the impact will be insignificant should all the noise mitigatory measures be in place (refer to Section 11)

10.9 Air Quality

The information presented in this section is extracted from the specialist Air Quality study undertaken by SRK in 2021 with specific focus on the proposed pre-assembly and cable yard areas as well as Anglo Platinum Mogalakwena: continuous Ambient Air Quality Monitoring Report: May-June 2022 prepared by SLR Group Company.

10.9.1 Ambient air quality

Air quality monitoring data from Mogalakwena Complex for this project is presented in this section. Data was received for dust fallout (DFO) as well as for PM₁₀ (particulate matter with an aerodynamic diameter < 10 microns), PM_{2.5} (particulate matter with an aerodynamic diameter < 2.5 microns), sulphur dioxide (SO₂), nitrogen dioxide (NO₂), ozone (O₃) and carbon monoxide (CO). A total of 36 DFO units have been installed in and around the Mogalakwena Complex project area. Twenty are residential area DFO units and sixteen are non-residential rea DFO units. Four Oizom Polludrone Pro analysers (known as continuous ambient air quality monitoring system (CAAQMS)) for PM₁₀, PM_{2.5}, SO₂, NO₂, and O₃ analysis have been installed within the Mogalakwena Complex project area, along the boundary. The location of all the monitoring stations located in close proximity to the proposed pre-assembly and cable yard areas are presented in Table 10-18 and shown in Figure 10-23.

The following datasets have been collated:

- DFO results for the period January 2014 to April 2021.
- 24-hour average PM₁₀, and PM_{2.5} concentrations for May and June 2022
- 24-hour average NO₂ concentrations for May and June 2022
- 24-hour average SO₂ concentrations for May and June 2022
- 24-hour O₃ concentrations for May and June 2022

10.9.2 Existing Emission Sources

The existing air emissions sources identified within and around the Mogalakwena Complex include dust from roads and motor vehicles; vehicle tail pipe emissions; mining and processing activities; mine residue deposits; drilling and blasting; ore stockpiles; open pits; crushing and drilling and blasting

Table 10-18 includes the CAAQMS and DFO monitoring locations situated in near proximity to the proposed pre-assembly and cable yard areas.

Table 10-18: CAAQMS and DFO monitoring locations

Field ID	Parameter	Classification	Latitude (X)	Longitude (Y)
Skimming BSP 117	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃	N/A	-11169.5	-2653667
Ga-Molekwane BSP 128	PM ₁₀ , PM _{2.5} , SO ₂ , NO ₂ , O ₃	N/A	-13970.6	-2648155
P34	DFO	Non-residential	695815	7344169
P46		Non-residential	693144	7346056
P9		Non-residential	694865	7345368
P21		Non-residential	695868	7347337
P31		Non-residential	695176	7347346
ZWNDS		Non-residential	693135	7346189

10.9.3 Monitoring

Dust fallout results

The average monthly DFO rates for non-residential and residential areas are below the respective standards at all monitoring points across Mogalakwena Complex. All non-residential were in compliance with the National Dust Control Regulation's non-residential standard of 1 200 mg/m²/day. DFO also rates remain below the residential area standard of 600 mg/m²/day for monitoring points indicated in Table 10-18.

Air quality sampling points in the vicinity of the proposed pre-assembly and cable yard are indicated in Figure 10-23.

Particulate matter

PM₁₀ and PM_{2.5} monitoring at the Mogalakwena Complex site was undertaken as part of the ambient air quality monitoring programme and the May 2022 and June 2022 results have been used to inform this section. The average daily PM₁₀ and PM_{2.5} results for the Skimming BSP 117 monitoring location are presented in Table 10-19¹⁰.

Table 10-19: Average daily PM10 and PM2.5 concentrations (µg/m³) at the Skimming BSP 117 CAAQMS

Month	PM _{2.5}	PM ₁₀
May	12 µg/m ³	31 µg/m ³
June	18 µg/m ³	6 µg/m ³

Overall compliance was achieved comfortably for this first survey reporting period of May and June 2022, with meaningful trends but no transgressions of any applicable NAAQS. Particulate matter is generally considered the 'primary' pollutant and a useful indicator for general air quality.

Gaseous pollutants

While the weather and PM sensors showed good data collection for these first two months, the validation of gaseous concentrations revealed that the electrochemical cells are more sensitive to power fluctuations, evident as:

- Obvious spikes in the data under very low power conditions (critical voltage required); and
- Longer recovery times (than weather and PM sensors) following power interruptions for the cells to stabilise to meaningful values.

The data validation procedure removed any 24-hour average readings when the average battery voltage for the day was below 45%. Given the application of this validation criterion, less days or results are available for gases, but those presented are considered to be representative, and provide sufficient detail to assess initial compliance. Measures to improve the solar-battery power supply are currently being investigated.

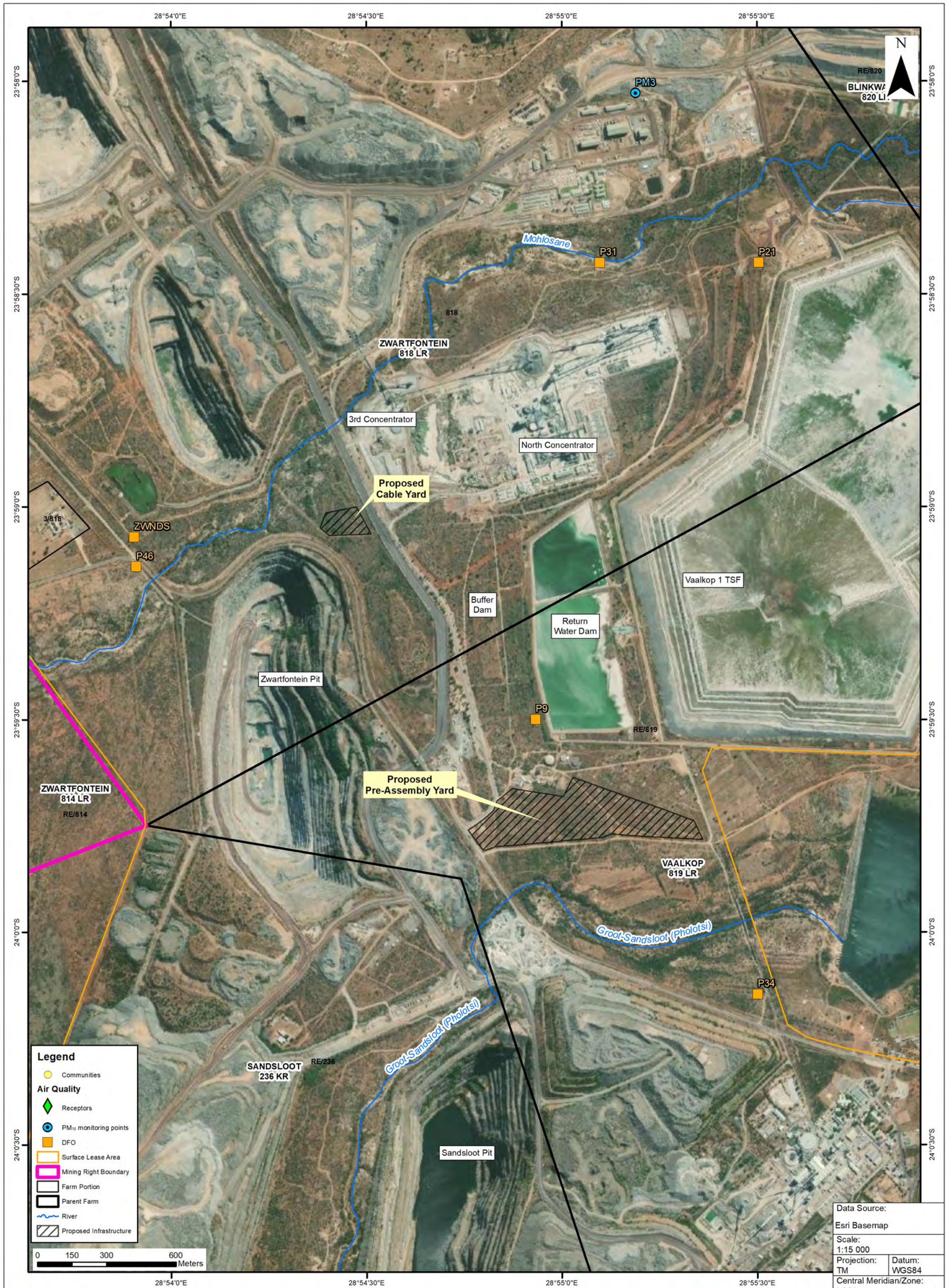
Average daily gaseous pollutant concentrations for May and June 2022 are included in Table 10-20.

¹⁰ The station Skimming gave the most complete and reliable results over the initial two months (87% data recovery for May 2022 and 91% for June 2022) and is thus presented here. The entire CAAQMS at Ga-Molekwane was stolen from this site between the installation (mid-April) and activation (3 May) and therefore data has not been collected at this monitoring point.

Table 10-20: Average daily gaseous pollutant concentrations ($\mu\text{g}/\text{m}^3$) at the Skimming BSP 117 CAAQMS

Month	NO ₂	SO ₂	O ₃
May	49 $\mu\text{g}/\text{m}^3$	22 $\mu\text{g}/\text{m}^3$	12 $\mu\text{g}/\text{m}^3$
June	27 $\mu\text{g}/\text{m}^3$	6 $\mu\text{g}/\text{m}^3$	17 $\mu\text{g}/\text{m}^3$

Averages remain below the annual NAAQS for SO₂ and O₃ however the NO₂ result for May is slightly above the annual NAAQS. Due to the limited data available at this stage (the CAAQMS system is a recent installation at Mogalakwena Complex) as well as several teething issues associated within installation, it is anticipated that more reliable data will become available once all of the issues are rectified.




Data Source:	
Esri Basemap	
Scale: 1:15 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date:	Compiled by:
07/09/2022	LOUA
Project No.	Fig No.
575107	10-23
Revision:	Date:

10.10 Cultural Heritage

The information presented in this section is extracted from the specialist Heritage and Palaeontology studies undertaken by PGS Heritage and Banzai Environmental in 2022 for the proposed pre-assembly and cable yard areas (Appendix E).

Table 10-21 and Table 10-22 presents the status quo and key findings pertaining to the heritage baseline within the proposed cable yard and pre-assembly areas respectively based on the fieldwork assessment undertaken on 27 October 2021. Figure 10-30 indicates the heritage features observed during the fieldwork.

Table 10-21: Heritage status quo and findings within the proposed cable yard

Aspects	Description	Photographs and maps
Desktop assessment	<p><u>Desktop baseline based on 1963 aerial photograph</u></p> <ul style="list-style-type: none"> • The surroundings of the study area is characterised by a long and significant history • The assessment of the available topographic maps and old aerial photographs revealed that at least two black homesteads were located within the proposed development footprint area. One of these homesteads (Feature 2) is clearly depicted within the proposed development footprint area on the 1963 aerial photograph (Figure 10-24). • The second homestead is depicted on the eastern boundary of the development footprint area on the First Edition of the 2328DD Limburg Topographic Sheet. Interestingly, the aerial photographs do not depict the homestead identified on the topographic map, and the topographic maps do not depict the homestead depicted on the aerial photograph. • Past experience has shown that in some cases stillborn babies and infants were buried in close proximity to such black homesteads in unmarked graves. These graves were frequently positioned along the sides, or underneath, the parents' dwelling. • Feature 1 represents an old road shown to pass through a section of the proposed development footprint. No evidence for this road could be observed during the fieldwork. • Feature 3, situated outside of the proposed development footprint consists of old mining remains however No evidence for historic mining activities or associated structural features were identified during the fieldwork. 	 <p>Figure 10-24: The study area as depicted on the 1963 aerial photograph ((NGI, Aerial Photographs, 480_09_00273). The proposed development footprint area is shown in red line.</p>



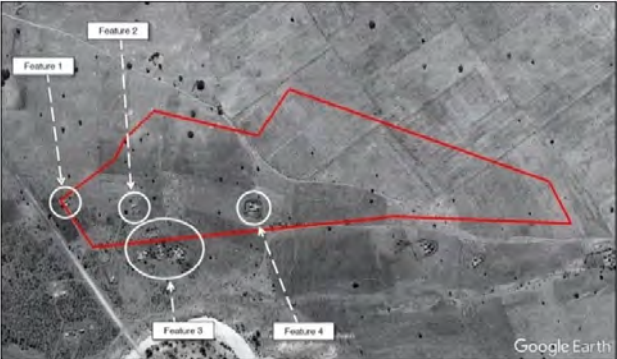
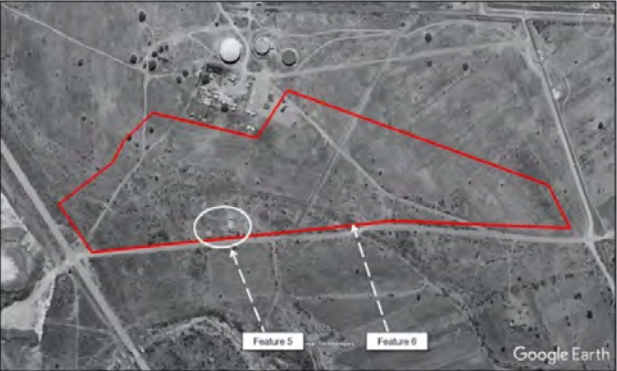

	<p>Desktop baseline based on 2004 aerial photograph</p> <ul style="list-style-type: none"> No clear evidence for the old road can be seen within the proposed development footprint area on the aerial photograph. This said, lanes of trees can be seen in sections where the road used to be located. Feature 1 in Figure 10-30 indicates the start of such a lane of trees within the development footprint area. No evidence for the homestead that was depicted on the 1963 aerial photograph can be seen on this 2004 image. Feature 2 in the Figure 10-30 defines the approximate area where the homestead was depicted on the 1963 aerial photograph. An extensive area located to the northwest of the development footprint area is characterised by various features, including what appears to be a waste rock dump and two dams. According to the topographic maps included in the heritage report (Appendix E), the Northern Prospecting Platinum Mine was located here. While the extent of the old mining remains is not easily defined on this aerial photograph, it would appear that the remains of this old mine extended into small segments of the development footprint area. No evidence for historic mining activities or associated structural features were identified during the fieldwork. See Feature 3 in Figure 10-30. A new road that runs along a new mine pit can be seen to the south of the development footprint area. See Feature 4 in Figure 10-30. 	 <p>Figure 10-25: The study area as depicted on the 2004 aerial photograph ((NGI, Aerial Photographs, 498_478_10_0005). The proposed development footprint area are shown in red line.</p>
<p>Fieldwork findings</p>	<ul style="list-style-type: none"> It is important to note that no evidence for the homestead could be observed during the fieldwork undertaken for this study. Although no evidence for the homesteads could be identified during the fieldwork, the risk still exists for unmarked graves associated with this homesteads to be located within the study area. Throughout the fieldwork, hand-held GPS devices were used to record the tracklogs showing the routes followed by the two archaeological fieldwork teams. Please refer to Figure 10-26 for a map indicating the tracks that were recorded by the fieldwork team. Despite the intensive fieldwork being undertaken, no evidence for any archaeological or heritage sites could be identified within the study area. 	 <p>Figure 10-26: Google Earth image depicting the tracklogs that were recorded in the field. The study area boundaries are shown in red line.</p>
<p>Impact</p>	<p>The proposed cable yard area is not expected to have any impact on cultural heritage resources (refer to Section 11)</p>	

Table 10-22: Heritage status quo and findings within the proposed pre-assembly yard

Aspects	Description	Photographs and maps
Desktop assessment	<p>Desktop baseline based on 1963 aerial photograph</p> <ul style="list-style-type: none"> • Three homesteads (Feature 1,2 and 4) are depicted within the study area boundary with a fourth homestead (Feature 3) located immediately south of the study area (Figure 10-27). No evidence for any of these homesteads could be identified during the fieldwork • Extensive sections of the study area were used for the cultivation of crops. These cultivated lands are especially visible in the eastern and north-eastern sections of the study area. This said, cultivated lands are depicted throughout the study area. A secondary gravel road is seen cutting diagonally through the study area. Additionally, smaller tracks can also be discerned providing access to the various homesteads from within the study area. 	 <p>Figure 10-27: The study area as depicted on the 1963 aerial photograph ((NGI, Aerial Photographs, 480_09_00273). The study area boundary is shown in red line.</p>
	<p>Desktop baseline based on 2004 aerial photograph</p> <ul style="list-style-type: none"> • None of the homesteads that were depicted on the 1963 aerial photograph can still be seen on the 2004 image (Figure 10-28). • Extensive sections of the study area appears to still have been used for the cultivation of crops. • Three massive water reservoirs are depicted a short distance north of the study area. A rectangular arrangement of buildings is shown in the section between the study area and these reservoirs. These buildings may have been associated with the construction of these reservoirs and the mine. • The same gravel road is again seen cutting diagonally through the study area. Additionally, a new gravel road is shown to cut through the western end of the study area. Finally, newly built roads are shown to the west and immediately south of the study area. These roads may have been built by the mine. • Four building clusters consisting of structural remains of this site were identified during the fieldwork (Feature 5) • A canal is shown to cut through the study area (Feature 6) 	 <p>Figure 10-28: The study area as depicted on the 2004 aerial photograph ((NGI, Aerial Photographs, 498_478_10_0005). The study area boundary is shown in red line.</p>

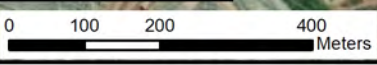
<p>Fieldwork findings</p>	<ul style="list-style-type: none"> • The site comprises the remains of at least four structures. Two of the structures are connected by a concrete foundation. The remains of a toilet was also identified. The buildings have collapsed and only rubble and foundations remain. • An assessment of the available aerial photographs indicates that the buildings from the site were erected between 30 April 1983 and 12 July 1993. This is said as no evidence for the site can be discerned on the aerial photograph taken in 1983, whereas the site is clearly depicted on the 1993 aerial photograph. • A member of the local community indicated that the site appears to have been used as a mechanical workshop. This is confirmed by the presence of a vehicle inspection or grease pit identified at one of the structures. • Although the site appears to have been used as a mechanical workshop, it seems likely for a homestead(s) to also have been located here. Past experience has shown that in some cases stillborn babies and infants were buried in close proximity to such black homesteads in unmarked graves. These graves were frequently positioned along the sides, or underneath, the parents' dwelling. As the site is not occupied anymore, no direct information with regards to the presence (or not) of such graves is currently available. 	 <p>Figure 10-29: General view of the site. Some of the structural remains can be seen.</p>												
<p>Significance of findings</p>	<p>Due to the contemporary nature of the site, the structural remains of the site are deemed to be of:</p> <ul style="list-style-type: none"> • Generally Protected C (GP. C) or Low Significance. • However, the risk for the presence of unmarked graves does exist. Until such time that the presence of graves in the area has been confirmed or disproved, the site must be viewed as containing graves. All graves have high levels of emotional, religious and in some cases historical significance. The possible presence of graves requires a higher significance level for the site. Site MPAY-01 (coordinates provided in Table 10-23) is therefore deemed to be of Generally Protected A (GP. A) or High/Medium Significance, which means that mitigation is required (refer to Section 11). 	<p>Table 10-23: Coordinates of heritage site MPAY-01</p> <table border="1" data-bbox="1161 930 1919 1101"> <thead> <tr> <th>MPAY-01 (A)</th> <th>MPAY-01 (B)</th> <th>MPAY-01 (C)</th> <th>MPAY-01 (D)</th> </tr> </thead> <tbody> <tr> <td>S -23.996494</td> <td>S -23.996431</td> <td>S -23.996380</td> <td>S -23.996225</td> </tr> <tr> <td>E 28.915694</td> <td>E 28.915990</td> <td>E 28.915114</td> <td>E 28.916112</td> </tr> </tbody> </table>	MPAY-01 (A)	MPAY-01 (B)	MPAY-01 (C)	MPAY-01 (D)	S -23.996494	S -23.996431	S -23.996380	S -23.996225	E 28.915694	E 28.915990	E 28.915114	E 28.916112
MPAY-01 (A)	MPAY-01 (B)	MPAY-01 (C)	MPAY-01 (D)											
S -23.996494	S -23.996431	S -23.996380	S -23.996225											
E 28.915694	E 28.915990	E 28.915114	E 28.916112											
<p>Impact</p>	<p>If mitigated the proposed pre-assembly area is not expected to have any significant impacts on cultural heritage resources (refer to Section 11)</p>													

10.10.1 Palaeontology study

The proposed development is primarily underlain by the Malmani Subgroup (Chuniespoort Group) within the Transvaal Supergroup. According to the PalaeoMap on the South African Heritage Resources Information System (SAHRIS) database, the Paleontological Sensitivity of the Malmani Subgroup is Very High (Almond and Pether 2008, SAHRIS website). It is thus recommended that a phase 1 field-based assessment report be conducted to assess the value and prominence of fossils in the development area and the effect of the proposed development on the paleontological heritage. The purpose of the report is to elaborate on the issues and potential impacts identified during process. A Phase 1 field-based assessment will be conducted and research in the site-specific study area as well as a comprehensive assessment of the likely impacts.



- Legend**
- Communities
 - ⊗ Old mines
 - Homestead
 - ⊗ Ruins
 - Surface Lease Area
 - Mining Right Boundary
 - Farm Portion
 - Parent Farm
 - ~ River
 - Proposed Infrastructure



Data Source:	
Esri Basemap	
Scale: 1:10 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date: 07/09/2022	Compiled by: LOUA
Project No. 575107	Fig No. 10-30
Revision: A Date: 11 10 2022	

10.11 Geohydrology

The information presented in this section is extracted from the specialist Hydrogeological study undertaken by Itasca Africa (Pty) Ltd in 2019.

The general geohydrological baseline for the Mogalakwena Complex is described in Table 10-24.

Table 10-24: General geohydrological baseline for Mogalakwena Complex

Baseline aspect	Description
Aquifers	<p>There are three aquifer systems underlying the Mogalakwena Complex area:</p> <ul style="list-style-type: none"> • There is a localised primary aquifer that occurs in the drainage channels of the Sandsloot, Mohlosane, and Witrivier non-perennial streams that drain the Mogalakwena Complex area to the Mogalakwena River. Sub-surface flow throughout the year in the sandy sediments is intercepted in the shallow boreholes (<15 m depth average where measurable) that are used extensively by the local communities as their domestic water supply; • The weathered bedrock aquifer extends to a depth of at least 30 -50m within the weathered bedrock units; • Groundwater flow in the unweathered bedrock is controlled mainly through fractures and joints and major fault blocks which are hydraulically connected. Higher yields occur in the shear zones at the contact with the Platreef, which serves as the main storage component of the aquifer, with some contribution by seepage from the overlying weathered zone.
Groundwater vulnerability	<p>Most of the Mogalakwena Complex area falls within the medium and low vulnerability rating. The medium vulnerability area corresponds to the Malamani Dolomites to the south of the mine.</p>
Aquifer classification	<ul style="list-style-type: none"> • According to the Hydrogeological Map (1:500 000) series, the regional hydrogeology is characterized as an 'intergranular and fractured aquifer' with a typical potential yield of 0.1 to 5.0 L/s. The underlying Malamani dolomite to the south of the Mine is characterised as a 'Karst aquifer' with yields of around 0.5 to 2.0 L/s • Based on the National Aquifer Classification map, the aquifer system underlying the site is regarded a "major aquifer" for the dolomites and a "minor aquifer" for the remainder of the Mine Area. • Regardless of the poor quality of the groundwater and the low yields of the fractured aquifer, the fact that the informal households in the surrounding communities use the groundwater as their main water supply, the aquifer around the Mine is classified as a sole-source aquifer system, according to the DWS classification system (1998).
Groundwater levels	<ul style="list-style-type: none"> • The location of the monitored boreholes in the vicinity of the pre-assembly yard and cable yard at Mogalakwena Complex is shown in Figure 10-31 with a brief summary of the measured groundwater-level data provided below: • The depth to the groundwater table is generally between 0.5 to 24 mbgl. • Groundwater flow is from SE to NW towards the Mogalakwena River, from > 1150 mamsl upgradient of the Mine to 1060 mamsl downgradient of the mine. • The pits have been mined below the groundwater table and therefore are localised sinks or discharge points to the groundwater flow. • Significant groundwater level fluctuations occur in response to the recharge and discharge cycles that occur during the wet and dry seasons in the shallow alluvial boreholes. • Almost all the measured groundwater levels in the deeper Mine monitoring boreholes do not fluctuate with precipitation events. This suggests that the recharge to the bedrock groundwater system during precipitation is limited to the unsaturated,

	<p>permeable topsoil and fractured rocks and discharges via the alluvial sediments as sub-surface flow. The recharge from precipitation to the deeper groundwater system is a slow infiltration process.</p> <ul style="list-style-type: none"> • There is no obvious vertical hydraulic gradient, however, a minor downward vertical gradient was observed. For the low hydraulic conductivity value rocks at the Mogalakwena Complex, it is reasonable to observe no obvious or minor downward vertical gradients at the piezometers that are outside the perimeter of the open pits, confirming that the cone of drawdown due to the mining is steep and does not extend laterally.
Hydrocensus	<ul style="list-style-type: none"> • The latest hydrocensus was conducted in June 2018. • Groundwater is the main water supply to the communities for domestic consumption and for livestock watering. Based on the recent hydrocensus, 92% of the boreholes located in villages surrounding the Mine, (both upstream and downstream), are used as their domestic water supply. It is noted that most of the communities are clustered along the banks of the Witrivier, Mohlosane and Sandsloot rivers due to the availability of water from the shallow boreholes exploiting sub-surface flow throughout the year. Other villages at distance from the alluvial drainage channels are likely to be exploiting the weathered aquifer. • Although no pumping-rate data are available, it is reasonable to assume that all boreholes pump at low rates to supply the domestic needs. The effect of these pumping boreholes on the regional groundwater flow condition below the weathered zone is likely to be very limited. The effect of these domestic pumping boreholes on the migration of the solutes related to Mine operation is also likely to be small.
Background groundwater quality	<ul style="list-style-type: none"> • Due to the semi-arid environment and high evaporation rate the background groundwater is slightly brackish from the accumulation of salts in the soil profile. • The groundwater quality from most of the Mine monitoring boreholes have marginal to poor groundwater quality due to elevated magnesium, chloride and sulphate. • Concentrations are in the range of TDS of 600-730 mg/L, Na of 80-100 mg/L, Cl 30-75mg/L, SO₄ at 2-7 mg/L) and NO₃- N (< 2 mg/L). SRK 5S represents the shallow background alluvial aquifer (next to the existing spring and wetland) with TDS of 364 mg/L, Na of 103 mg/L, Cl of 96 mg/L and SO₄ of 31 mg/L and NO₃ > 1 mg/L . • Densification of the surrounding communities with on-site sanitation (pit latrines) and roaming livestock can result in elevated salts (NO₃ and Cl) both upgradient and downgradient of the mine in the shallow alluvial aquifers. • The closest groundwater monitoring points to the pre-assembly and cable yard areas are indicated in Figure 10-31
Impact	<p>It is not anticipated that the proposed pre-assembly yard and cable yard areas will have an impact on the background groundwater quality as long as the current approved groundwater mitigation and management measures contained within the approved EMPs for the complex are applied (refer to Section 11.3).</p>



Data Source:	
Esri Basemap	
Scale: 1:10 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date: 07/09/2022	Compiled by: LOUA
Project No. 575107	Fig No. 10-31
Revision:	Date:

10.12 Surface water hydrology

The information presented in this section is extracted from the specialist Surface Water study undertaken by SRK in 2021 and updated in 2022.

The Mogalakwena Complex area is situated in quaternary catchment A61G, (Limpopo River Water Management Area A6) (Figure 10-32) approximately 30 km northwest of Mokopane, in the Mogalakwena Local Municipality of the Limpopo Province. There are three main rivers within the Mogalakwena Complex area namely the Groot Sandsloot (Pholotsi) River, Mohlosane River and Witrivier. The Sandsloot and the Mohlosane Rivers are in the closest proximity to the proposed project areas. The overall surface water hydrology baseline is described in Table 10-25.

Table 10-25: Surface water hydrology baseline

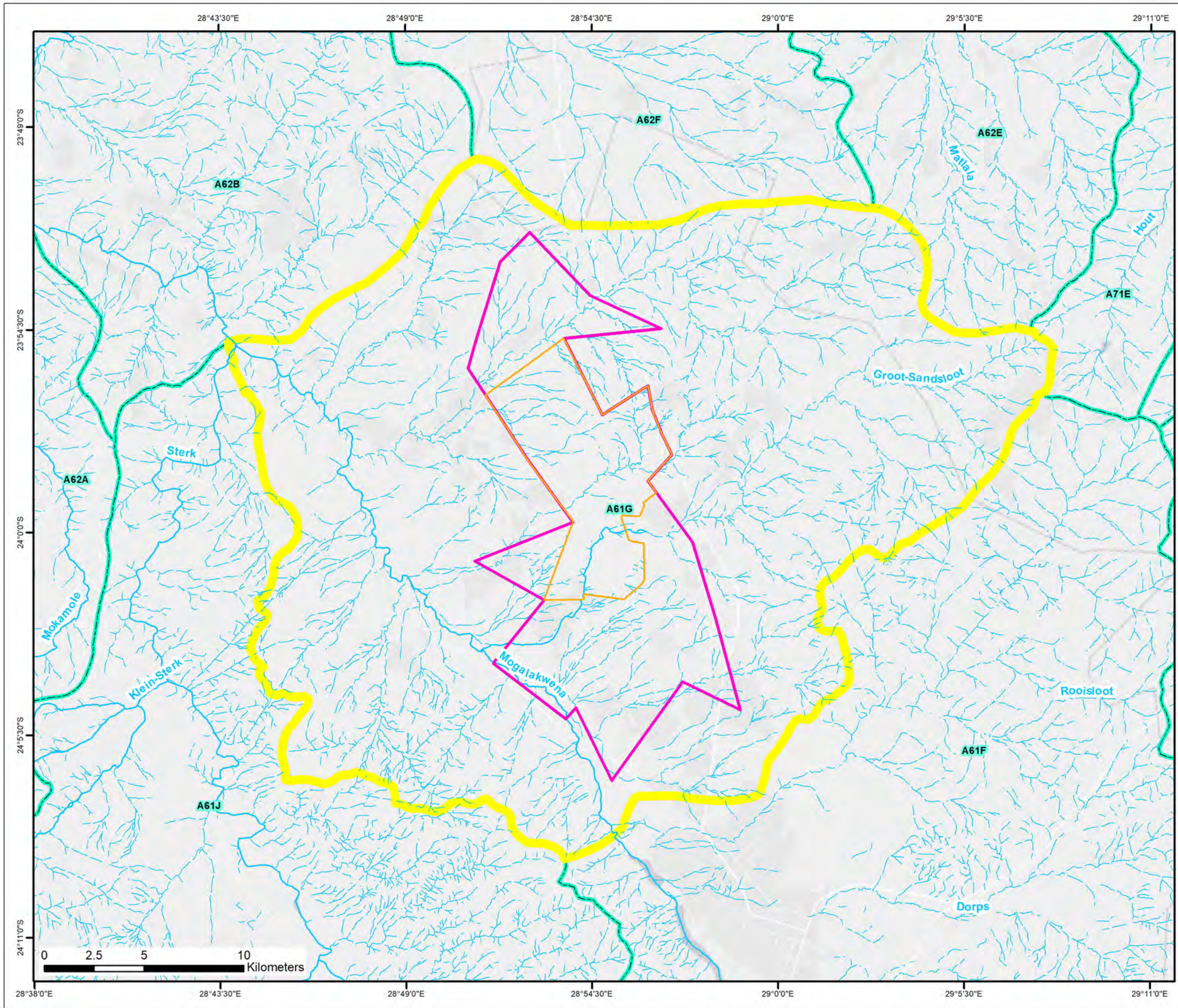
Baseline aspect	Description										
Surface water use	<p>Domestic and industrial use</p> <ul style="list-style-type: none"> Mogalakwena Complex abstracts water from three wellfields within the mine lease area and surrounds. Communities surrounding the mine also rely on groundwater for potable and domestic use. Industrial use in the immediate area is limited to mining operations. Process water is made up of sewage effluent from the Mokopane and Polokwane sewage works, open pit water and process water dams that includes the return water from the TSFs. Wellfield water supplements the process water. The water is contained within the mine's dirty water circuit and this captured water is also used in the process. <p>Livestock watering and irrigation</p> <ul style="list-style-type: none"> Surface water is used for farming and livestock watering, although this is severely limited by the intermittent nature of flow in the rivers. The communities surrounding the mine also make use of the water in the Groot Sandsloot (Pholotsi) River when the water comes to surface 										
Surface water hydrology	<p><u>Catchment characteristics</u></p> <p>Catchment area and river lengths in the vicinity of the proposed supporting infrastructure were determined from the 5 m contour data as abstracted from the 1:10 000 topographical maps. These catchments were then plotted on the 1:50 000 maps. The catchment characteristics are presented in Table 10-26.</p> <p>Table 10-26: Summary of catchment characteristics</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #cccccc;">Catchment Name</th> <th style="background-color: #cccccc;">Area (km²)</th> <th style="background-color: #cccccc;">Longest Watercourse (m)</th> <th style="background-color: #cccccc;">10:85¹¹ Slope (m/m)</th> <th style="background-color: #cccccc;">Tc (hours)¹²</th> </tr> </thead> <tbody> <tr> <td>Mohlosane</td> <td>56</td> <td>7600</td> <td>0.016</td> <td>2.2</td> </tr> </tbody> </table>	Catchment Name	Area (km ²)	Longest Watercourse (m)	10:85 ¹¹ Slope (m/m)	Tc (hours) ¹²	Mohlosane	56	7600	0.016	2.2
Catchment Name	Area (km ²)	Longest Watercourse (m)	10:85 ¹¹ Slope (m/m)	Tc (hours) ¹²							
Mohlosane	56	7600	0.016	2.2							

¹¹ 10:85 slopes denote the slope of the catchment from a point 10% from the end point and 85% of the distance to the furthest point.

¹² Time of concentration denotes the length of time it takes for a raindrop to travel from the furthest point of the catchment to the outlet point

	<p><u>Normal dry weather flow</u></p> <p>The normal dry weather flow is defined, as the flow that occurs 70% of the time in the three driest months (June, July, and August). The system has negligible flow during the dry season and can therefore be classified as non-perennial.</p> <p><u>Flood peaks</u></p> <p>The flood peaks were determined for each catchment using various methods including Unit Hydrograph method, the Standard Design Flood (SDF) method and Empirical Regional Maximum Flood (RMF) method, except for Witrivier catchment where rational method was used. The SDF Method peaks were adopted and they are presented in Table 10-27.</p> <p>Table 10-27: Peak flow summary</p> <table border="1" data-bbox="440 520 1393 793"> <thead> <tr> <th colspan="2" rowspan="2">Peak flow and volume</th> <th colspan="6">Return Period (years)</th> </tr> <tr> <th>2</th> <th>5</th> <th>10</th> <th>20</th> <th>50</th> <th>100</th> </tr> </thead> <tbody> <tr> <td colspan="8" style="text-align: center;">Catchment Mohlosane: 56 km²</td> </tr> <tr> <td>Peak Flows (m³/s)</td> <td>SDF Method</td> <td>10</td> <td>57</td> <td>102</td> <td>155</td> <td>234</td> <td>301</td> </tr> <tr> <td colspan="8" style="text-align: center;">Catchment Groot Sandsloot: 176 km²</td> </tr> <tr> <td>Peak Flows (m³/s)</td> <td>SDF Method</td> <td>54</td> <td>86</td> <td>116</td> <td>155</td> <td>235</td> <td>324</td> </tr> </tbody> </table> <p><u>Floodlines</u></p> <p>Both the proposed cable yard and pre-assembly yard areas are located outside of the 1:100 year floodline.</p>	Peak flow and volume		Return Period (years)						2	5	10	20	50	100	Catchment Mohlosane: 56 km ²								Peak Flows (m ³ /s)	SDF Method	10	57	102	155	234	301	Catchment Groot Sandsloot: 176 km ²								Peak Flows (m ³ /s)	SDF Method	54	86	116	155	235	324
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Catchment Groot Sandsloot: 176 km ²																																															
Peak Flows (m ³ /s)	SDF Method	54	86	116	155	235	324																																								
<p>Surface water quality</p>	<ul style="list-style-type: none"> • Aqua Earth Consulting has been tasked by Mogalakwena Complex to compile water quality reports linking mine activities and performance against the WUL conditions relating to surface and groundwater monitoring. Detailed water analysis of the data is provided in the Aqua Earth quarterly and annual reports, which are submitted to DWS. • Water quality is monitored at Mogalakwena Complex to compile water quality reports linking mine activities and performance against the WUL conditions. • The sample analysis includes all major cations and anions, as well as physical parameters, such as Electrical Conductivity, pH, Total Dissolved Solids, sulphate and nitrate. Surface water samples are collected from surface water bodies situated in and around the mine on a monthly basis, provided water is present for sampling in the non-perennial rivers. Detailed water analysis of the data is provided in the Aqua Earth water quality reports, which are submitted to the DWS as per the WUL. • Subsurface river flow daylightings in certain areas within each of the riverbeds and this is where the monitoring points have been located. The intermittent flow in the rivers causes periodic anomalies/outliers in the data and impacts on the interpretation of the water quality data, for example, suspended solids increase after rainfall events and this impact is not necessarily directly associated with mining activities. Routine monitoring was initiated in January 2008. • A guideline value for the most sensitive user/condition for each constituent monitored has been identified and is referred to as the Identified Resource Protection (IRP) value. The IRP has been used for the water quality assessment in the absence of WUL surface water quality limits. It must be stated that the IRP is a precautionary limit and does not represent the environmental considerations of this area, however, this approach is in line with the NEMA Precautionary Principle. • Current surface water monitoring points situated in close proximity to the proposed infrastructure are presented in Figure 27-1. • The closest surface water monitoring point to the proposed pre-assembly yard is SGB (Sandsloot bridge) located on the Groot Sandsloot River directly south and downstream of the Pre-Assembly Yard. Water quality sampling is sporadic as the Groot Sandsloot River is non-perennial and may only have water present after rainfall events. In general, water quality within the Groot Sandsloot River indicates and increase in Electrical Conductivity, Calcium, 																																														

	<p>Sulphate and Nitrate between the upstream and downstream monitoring points which is indicative of mining impact.</p> <ul style="list-style-type: none"> The closest surface water monitoring point to the proposed cable yard is MRU situated directly downstream of the north mining offices. The poor water quality is attributed to the elevated concentrations of sodium, magnesium, calcium, chloride and manganese. Fluctuating sulphate concentrations were observed for the MRU sampling point during the sampling period with exceedances to the IRP limit in the February and June 2020 samples. Samples exceeded the IRP for calcium and magnesium; however, this can mostly be attributed to the geology of the environment. The sampling period, however, presented a decrease in sodium concentrations for the MRU sampling point.
<p>Impact</p>	<p>It is not anticipated that the proposed pre-assembly yard and cable yard areas will have an impact on the surface water resources as long as the current approved groundwater mitigation and management measures contained within the approved EMPs for the complex are applied (refer to Section 11).</p>



Legend

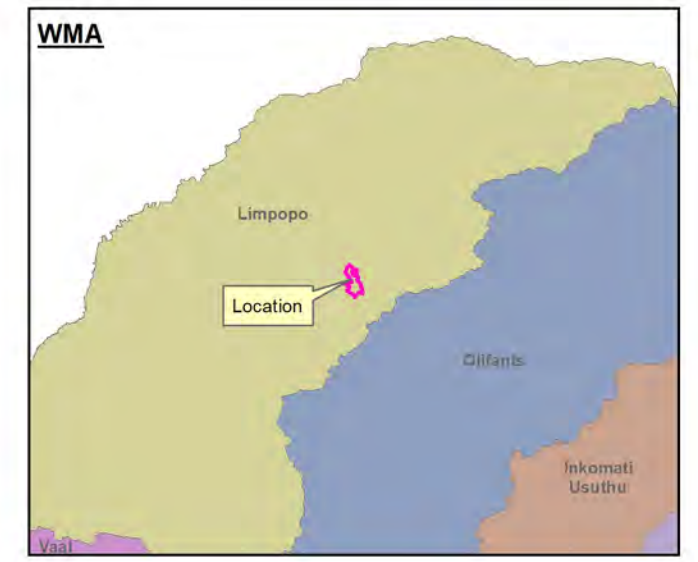
- Surface Lease
- Mining Right Boundary

Rivers

- Perennial River
- Non-Perennial River

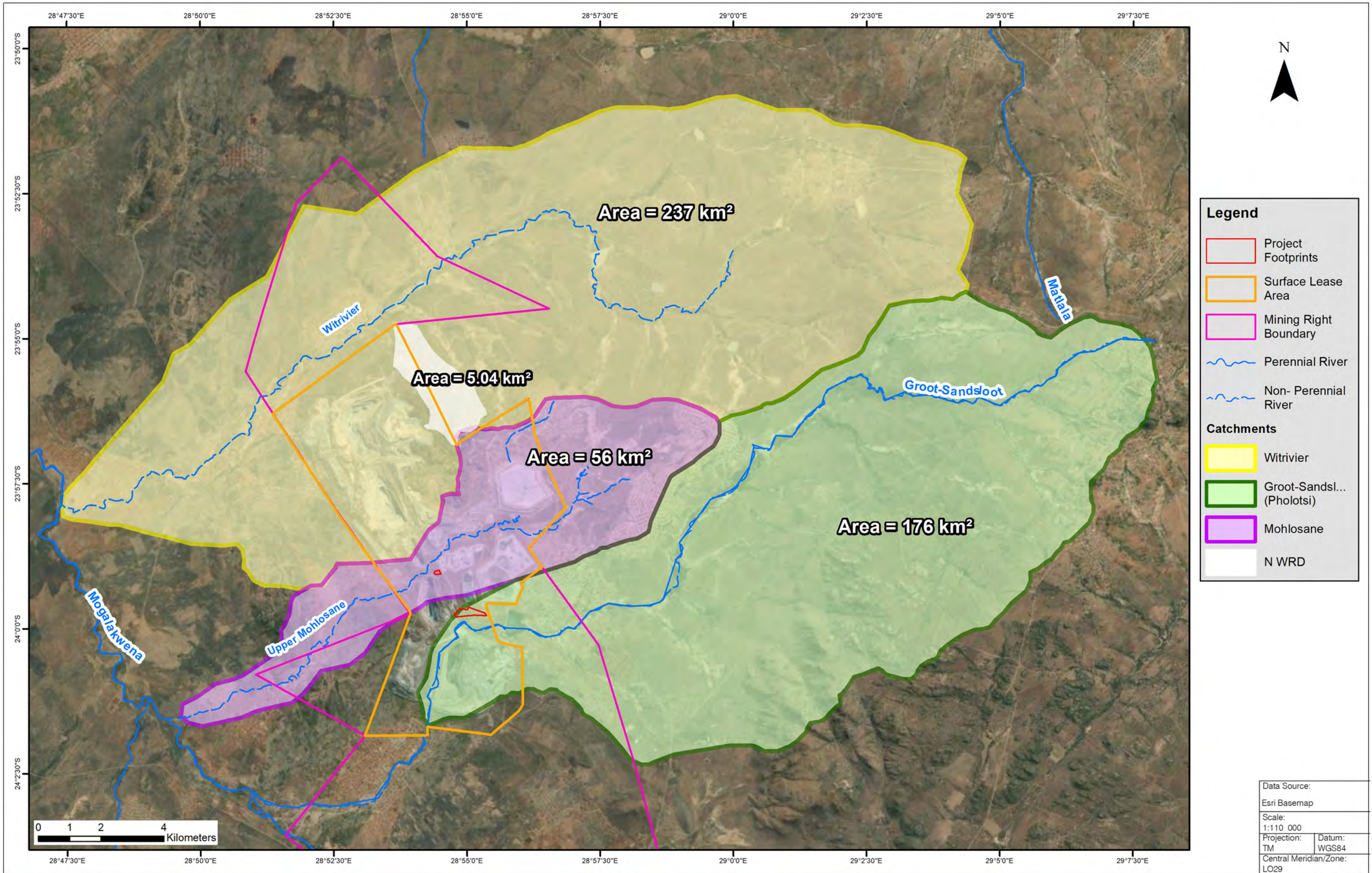
Quaternary Catchment

- Quaternary Catchment
- QC:A61G



**MOGALAKWENA COMPLEX
SURFACE WATER RESOURCES MAP**

Data Source: 1:50 000 vector data Esri Basemap	
Scale: 1:200 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date: 12/09/2022	Compiled by: LOUA
Project No: 575107	Fig No: 10-32
Revision:	Date:



Legend

- Project Footprints
- Surface Lease Area
- Mining Right Boundary
- Perennial River
- Non-Perennial River

Catchments

- Witrivier
- Groot-Sandsl... (Pholotsi)
- Mohlosane
- N WRD

Data Source:	
Esri Basemap	
Scale:	
1:110 000	
Projection:	Datum:
TM	WGS84
Central Meridian/Zone:	
LO29	
Date:	Compiled by:
12/09/2022	LOUA
Project No:	Fig No:
575107	10-33
Revision:	Date:



MOGALAKWENA COMPLEX
CATCHMENTS - AREA

10.13 Socio-economic

The information presented in this section is extracted from the Social Impact Assessment (SIA) compiled by SRK Consulting in 2021.

Table 10-28 presents the socio-economic baseline for the area within which Mogalakwena Complex is located.

Table 10-28: Socio-economic baseline

Baseline aspect	Description
Local context	
<p>The Mogalakwena Complex Area of Influence (Aoi) has been updated to reflect communities that may be most impacted by the mine (AAP, 2021). Communities that are most severely impacted by mine operations fall within area 1 (previously known as doorstep communities), with the level of impact gradually reducing as the classification moves to area 2 through to area 5 (i.e., Provincial level).</p> <p>A total of 23 area 1 communities have been identified, with the majority (19) falling within the Mapela TA. A total of 29 area 2 communities have been identified, with the majority (17) falling within the Mapela TA. These areas, including area 3 (Mokopane) have been adopted by the SIA for indirect project impacts (e.g., employment opportunities).</p> <p>In order to identify the directly affected communities (for example, communities that are affected by noise or dust), the SIA assumed a 1km buffer area of any proposed new infrastructure. Consequently, there are no communities within 1km of the proposed pre-assembly and cable yard areas as shown in Figure 10-34. The closest communities include:</p> <ul style="list-style-type: none"> • Ga-Molekana • Skimming Leruleng 	
Geographic location and climate	
<p>According to the MLM IDP (MLM, 2021) MLM consists of three proclaimed townships (i.e., Mokopane, Mahwelereng and Rebone) and 178 villages. There are five main clusters, including: Mokopane; Mahwelereng and peri-urban areas; Mapela; Bakenberg; and Rebone.</p> <p>The villages in the rural areas are closely linked to subsistence farming, with many households dependent on agriculture for their livelihoods (MLM, 2021). Livestock farming is the predominant enterprise within the peri-urban areas. However, there is limited land to carry the current amounts of livestock. According to the MLM IDP (MLM, 2021), overgrazing is evident on communal grazing land compared to privately owned land.</p>	
Mogalakwena Local Municipality governance structures	
<p>The MLM has 178 rural settlements (traditional villages) spread across its municipal boundary, 70.9% of the population resides in these areas. The MLM has three additional semi-urban settlements (Ga-Pila (Sterkwater), Ga-Puka (Rooibokfontein) and Ga-Sekhaolelo (Armoede) all proclaimed as a result of relocation due to mining expansion in the Mapela TA area. Mogalakwena Complex is predominantly located on land owned by the Mapela TA, with the Mokopane TA situated immediately adjacent to the operation.</p> <p>As mentioned above, the communities in the MLM are governed by Traditional Councils and Leaders, with both the Mapela- and the Mokopane TA being recognised in terms of the Traditional Leadership and Governance Framework Act, Act 2 of 2005 (Framework Act).</p>	
Language and ethnic groups	

MLM's population is made up of 96.1% black Africans, 2.2% Whites and other population groups making up the remaining 0.8% (Stats SA, 2016). The principal spoken languages in the MLM is Sepedi (73.1%), followed by Xitsonga, (9.1%) and IsiNdebele (6.6%), but Tshivenda (16.5%) is spoken in the Limpopo Province as well (Stats SA, 2016).

Gender and age

The MLM population consists of a majority of males (51.6%) as compared to 48.8% of females (Stats SA, 2016). Within the MLM, 70.5% represent those of working age (15-65 years). MLM has more female headed households (59.4%) as compared to WDM, while the youth population is lower in the MLM at 30.8%. A summary of gender and age distribution is provided in Table 10-29 and Table 10-30.

Table 10-29: Gender 2011 and 2016

	2011		2016	
	Male	Female	Male	Female
Mogalakwena Local Municipality	46.7%	53.3%	51.6%	48.8%

Source: Stats SA, 2016

Table 10-30: Population age category

	Age group (2016)			
	0-14 (Children)	15-34 (Youth)	35-59 (Adults)	60+ (Elderly)
Mogalakwena Local Municipality	39.9%	30.8%	20%	9.4%

Source: Stats SA, 2016

Household income and poverty intensity

Household income¹³ is widely distributed across income brackets in the MLM. Household incomes are illustrated in Table 10-31 and shows that a high percentage (15.4%) of households in MLM have no income. This means that not one person in the household received an income, not even in the form of a pension or social grant and is, therefore, experiencing extreme poverty.

When combining the income brackets three to six in Table 10-31 one can determine that the majority of the MLM (65.8%) earn between R4,801 and R76,400 per annum. This is a low annual income and is reflective of inexpensive, labour intensive jobs available in the area. With adjustments for annual inflation, it is likely that those earning between the third and sixth income bracket would be earning between R230,000 and R365,000 in 2021.

In the MLM, household income ranges are similar, most of the population falling into the first six income brackets.

¹³ Household income is defined as all receipts by all members of a household, in cash and in kind, in exchange for employment, or in return for capital investment, or receipts obtained from other sources such as pension. Other sources of income are, for example social grants, Unemployment Insurance Fund, remittances, rentals, investments, sales or products, services, etc.

Table 10-31: Municipal population by household income

Income bracket No.	Household income range per annum	% Households in MLM
1	None	15.4%
2	R1 - R4,800	5.2%
3	R4,801 - R9,600	10.6%
4	R9,601 - R19,600	23.0%
5	R19,601 - R38,200	22.1%
6	R38,201 - R76,400	10.1%
7	R76,401 - R153,800	6.4%
8	R153,801 - R307,600	4.4%
9	R307,601 - R614,400	1.9%

Source: Stats SA, 2012

Services and infrastructure

Communities in the MLM were concerned with the cost of electricity, lack of safe and reliable water supply as well as a lack of, or inadequate employment opportunities. Communities within the MLM were similarly concerned about the inadequate roads in their area.

Access to education

There are 258 schools in the MLM, which is made up of 96 secondary schools, 151 primary schools, nine combined schools and two Further Education Training colleges. Other educational facilities include 176 Early Childhood Development centres, one special school and 47 Adult Basic Education and Training centres. Most of the villages surrounding the operation have one or more primary schools and a secondary school, making education accessible to most of the population. Despite this, not all children attend school, which is often due to financial factors, regardless of most schools not charging any fees. Many of the schools are understaffed and under resourced making the level of education below an acceptable standard (MLM, 2018).

Health facilities

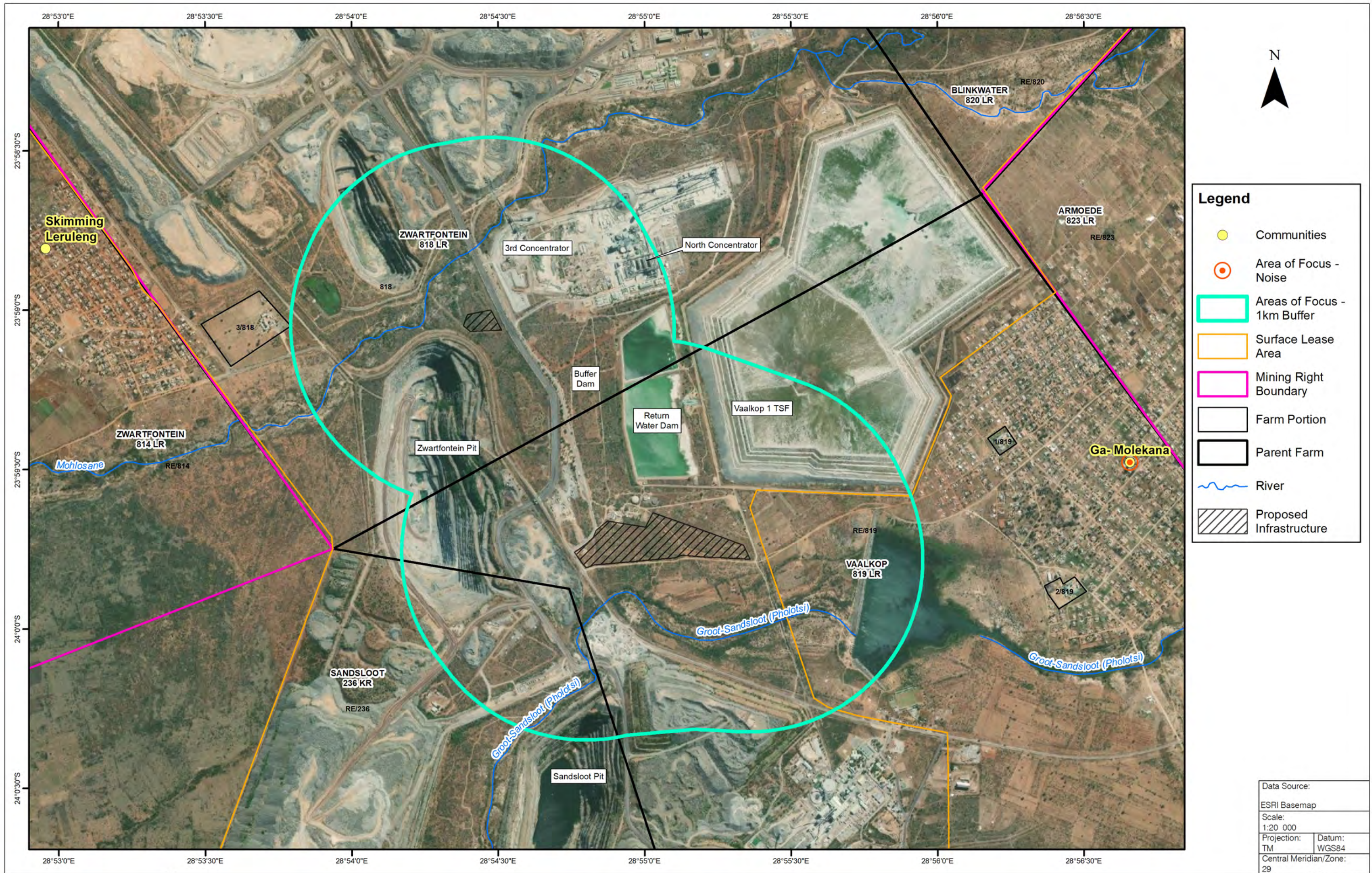
The MLM has 33 medical facilities, three hospitals (Mokopane Provincial Hospital in Mahwelereng, Voortrekker Hospital in Mokopane Town and George Masebe Hospital in Bakenberg), 29 clinics, 12 mobile clinics and one health centre (MLM, 2021). Clinics are scattered across the municipal area and are located at Mamaselela, Pholotji, Mahwelereng, Bokwalakwala, Sekuruwe, Tsamahansi, Bakenberg, Dibeng, Mashashane, Jakkalskuil and Lekhureng. Many communities and villages rely on the mobile clinics that are available within the MLM, with more than 80% of the population living within 120 minutes from health facilities (MLM, 2021).

Transportation infrastructure

According to the Mogalakwena SDF (MLM, 2009) the MLM area has a good road network and includes links to both the N1 in the south and the N11 running north-south through the area. Where the N11 serves the eastern border region of the MLM, the R518 fulfils this function along the western part of the MLM. The SDF further notes that there are good lateral links between the N11 and the R518.

The road infrastructure within the MLM with only 12% of the roads in the municipality being tarred. Main transport routes, including the N11 are tarred and frequently maintained, however, most of the population continues to rely on minor roads with poor stormwater management and poor surface quality, particularly in the rainy season (MLM, 2021).

Justice and policing											
<p>The MLM IDP (2018) indicates that numerous socio-economic factors such as poverty, unemployment and lack of education have contributed to an increase in the community’s crime rates.</p> <p>The MLM only has four police stations namely Gilead, Mahwelereng, Mokopane, and Tinmyne. The MLM (2021) indicated that more than 96% of the population is within a 30-minute drive from a police station. The occurrence of crime is relatively high in the MLM, where Mokopane and Mahwelereng are known as crime hotspots.</p>											
Socio-economic profile											
Employment	<p>Census data (Stats SA, 2012) show that only 26.2% of the MLM population aged between 15 and 65 years are employed (Table 10-32). The number of unemployed persons in the MLM was 17.6%.</p> <p>Table 10-32: Employment status per region</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th style="text-align: center;">Employed</th> <th style="text-align: center;">Unemployed</th> <th style="text-align: center;">Discouraged work-seeker</th> <th style="text-align: center;">Other not economically active</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Mogalakwena</td> <td style="text-align: center;">26.2%</td> <td style="text-align: center;">17.6%</td> <td style="text-align: center;">5.6%</td> <td style="text-align: center;">50.5%</td> </tr> </tbody> </table> <p>Source: Stats SA, 2012</p>		Employed	Unemployed	Discouraged work-seeker	Other not economically active	Mogalakwena	26.2%	17.6%	5.6%	50.5%
	Employed	Unemployed	Discouraged work-seeker	Other not economically active							
Mogalakwena	26.2%	17.6%	5.6%	50.5%							
Vulnerability											
<p>According to Blaikie. et. al (2004) as quoted by the World Health Organisation’s practical guide on environmental health in emergencies and disasters “vulnerability is the degree to which a population, individual or organization is unable to anticipate, cope with, resist and recover from the impacts of disasters”. Poverty is a major contributor to vulnerability, and considering high unemployment, and general poverty in the Mogalakwena Complex study area, it is reasonable to conclude that the area is demographically vulnerable. Population growth is expected to increase in areas where new economic development opportunities are available, and this could increase vulnerability, more so if it is coupled with reduced water availability and degradation and loss of land (whether mine-induced or not).</p>											
Impact	<p>It is not anticipated that the proposed pre-assembly yard and cable yard areas will have a positive impact on the socio-economic environment as no additional employment opportunities will be created. However limited negative impacts will result due to the construction and operation of the proposed projects (see Section 11 for the impact assessment)</p>										



Legend

- Communities
- Area of Focus - Noise
- Areas of Focus - 1km Buffer
- Surface Lease Area
- Mining Right Boundary
- Farm Portion
- Parent Farm
- ~ River
- Proposed Infrastructure

Data Source:	
ESRI Basemap	
Scale: 1:20 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: 29	
Date: 12/09/2022	Compiled by: LOUA
Project No: 575107	Fig No: 10-34
Revision:	Date:

11 Environmental Impact Assessment

This section provides an overview of the impact assessment methodology, the findings of the impact assessment phase which includes both positive and negative impacts identified for the various phases of the project (pre-construction, construction, operation and decommissioning and closure).

11.1 Approach

11.1.1 Prediction of significant environmental issues

Potential environmental issues or impacts associated with the proposed project were identified through a review and consideration of the following:

- The nature and profile of the receiving environment which included both a desktop evaluation (available documents, existing EMPs, GIS maps) and a site visit to the areas where the proposed project will be developed;
- Specialist studies undertaken as part of this project;
- Understanding of the direct and indirect effects of the project as a whole; and
- Legal context.

Environmental and social impacts have been highlighted in Section 11.4 for each environmental aspect considered. In addition to this, the cumulative impacts have been briefly described in Section 11.4.5.

11.1.2 Mitigation of impacts

A detailed assessment was conducted to evaluate possible impacts with input from the project team, existing specialist studies and specialist studies undertaken as part of this project, making use of the impact assessment methodology described in Section 11.3.

Practical mitigation measures were identified with the following objectives:

- 1) To firstly strive to prevent the occurrence of the impact; and
- 2) If the impact cannot be prevented, then measures need to be put in place to minimise the significance of the impact

The mitigation measures associated with the proposed project have been included Table 11-5 to Table 11-12.

11.2 Summary of environmental and social impacts identified

The pre-assembly and cable yard projects fall within the Mogalakwena Complex's mine right and surface right areas. Based on assessments undertaken for previous projects at the Complex as well as studies conducted for the proposed pre-assembly and cable yard sites, the impacts associated with the proposed projects are considered to be limited.

If managed according to the proposed management measures in Section 12 and Part B, negative impacts associated with pre-construction, construction, operation, closure and post closure phases of the proposed projects can be mitigated and positive impacts can be enhanced.

Table 11-1 includes a summary of the expected impacts prior to the implementation of management measures. These impacts have been assessed in line with the impact assessment methodology in Section 11.3.

Table 11-1: Expected impacts arising from project related activities during different project phases for both the proposed pre-assembly and cable yard

Project Phase	Activity
Pre-construction	<ul style="list-style-type: none"> • Loss of cultural heritage due to pre-construction activities such as site clearing and preparation • Disturbance of soils due to site clearing and preparation • Dust generation and emissions due to construction vehicles moving on bare land • Impact on Habitat Units due to a lack of identification and relocation of flora to suitable habitat outside the development footprint prior to the construction phase • Unknown impacts to palaeontology • Reduction in water quality due to increased turbidity as a result of an increase in erosion from the clearing of areas • Storage of general and hazardous waste
Construction	<ul style="list-style-type: none"> • Loss of floral diversity and habitat due to dumping of construction material within areas where no construction is planned, proliferation of alien invasive species at topsoil stockpiles spreading into the surrounding area, compaction of soils outside of the study area and habitat fragmentation • Erosion as a result of poorly managed stormwater runoff resulting in downslope habitat loss • Increase in dust and exhaust emissions due to the construction machinery operating and travelling on unsealed roads • Increase in ambient noise levels due to clearing and stripping of topsoil and construction of infrastructure • Limited and temporary employment creation • Loss of soil utilisation potential and sterilisation due to placement/construction of permanent structures or hydrocarbon contamination, soil erosion • Pollution to land and or rivers from hydrocarbon spills from construction machinery, deterioration of surface water quality • Dust generation and emissions due to construction vehicles moving on bare land • Storage of general and hazardous waste • Increase community and employee exposure to hazards and risks
Operation	<ul style="list-style-type: none"> • Ongoing or permanent loss of floral habitat, diversity and increased introduction and proliferation of alien plant species. • Loss of floral habitat as well as overall species diversity within the local area, increased erosion as a result of poor stormwater management • Increase in AIP species due to disturbed areas • Increase in ambient noise levels due to the operation of the projects • Unfavourable perception of the project, opportunities for capacity building, impact on health and social well-being of surrounding communities • Loss of soil utilisation due to contamination from spillage of raw products or by-products, hydrocarbons, reagents and unprotected overland flow of dirty water • Dust generation due to mine vehicles travelling on bare roads • Sedimentation of watercourses due to operational activities;
Closure/ Rehabilitation	<ul style="list-style-type: none"> • Increase in ambient noise levels due to the operation rehabilitation machinery • Pollution to soils from hydrocarbon/reagent spillage from rehabilitation equipment • Impact of dust generated from rehabilitation machinery and from bare areas which need to be vegetated • Poor implementation of rehabilitation activities resulting in increased AIP species • Increase in turbidity of surface water caused by an increase in runoff from the cleared and stripped areas • Deterioration of soil stockpiles' viability
Post-closure	<ul style="list-style-type: none"> • Improvement of noise, air quality, visual and surface water impacts due to limited or no activities taking place at the sites and rehabilitation efforts • Uncontrolled access to rehabilitated sites by animals, vehicles, people will result in compaction and erosion of unprotected/non vegetative sites (over grazing etc.)

11.3 Methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of the potential environmental impacts and risks

The impact assessment will focus on the direct and indirect impacts associated with the project. All identified impacts have been analysed with regard to their extent, intensity, duration, probability and significance. The significance of potential impacts that may arise from the proposed project have been determined in order to assist decision-makers (typically by a designated authority or state agency, but in some instances, the proponent). The significance of an impact is defined as a combination of the consequence of the impact occurring (described as magnitude below) and the probability that the impact will occur.

The impact assessment methodology used, has been formalised to comply with Regulation 31(2)(l) of the National Environmental Management Act (Act 107 of 1998) as amended (NEMA), which states the following:

“(2) An environmental impact assessment report must contain all information that is necessary for the competent authority to consider the application and to reach a decision ..., and must include –

- (i) an assessment of each identified potentially significant impact, including –
- (i) cumulative impacts;
 - (ii) the nature of the impact;
 - (iii) the extent and duration of the impact;
 - (iv) the probability of the impact occurring;
 - (v) the degree to which the impact can be reversed;
 - (vi) the degree to which the impact may cause irreplaceable loss of resources; and
 - (vii) the degree to which the impact can be mitigated.”

Based on the above, the impact assessment Methodology requires that each potential impact identified is clearly described (providing the nature of the impact) and be assessed in terms of the following factors:

- Extent (spatial scale) - *will the impact affect the national, regional or local environment, or only that of the site?*
- Duration (temporal scale) - *how long will the impact last?*
- Magnitude (severity) - *will the impact be of high, moderate or low severity?;* and
- Probability (likelihood of occurring) - *how likely is it that the impact may occur?*
- To enable environmental significance (importance) of each identified potential impact to be quantified, a numerical value has been linked to each factor. The ranking scales applicable are shown in Table 11-2.

Table 11-2: Impact Ranking Scales

Occurrence	Duration	Probability
	5 – Permanent	5 – Definite/don't know
4 – Long -term (ceases with the operational life)	4 – Highly probable	
3 – Medium -term (5-15 years)	3 – Medium probability	
2 – Short-term (0-5 years)	2 – Low probability	
1 – Immediate	1 – Improbable	
	0 – None	
Severity	Extent/Scale	Magnitude
	5 – International	10 – Very high/uncertain

4 – National	8 – High
3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

Once the above factors had been ranked for each identified potential impact, the environmental significance of each impact can be calculated using the following formula:

$$\text{Significance} = (\text{duration} + \text{extent} + \text{magnitude}) \times \text{probability}$$

The maximum value that can be calculated for the environmental significance of any impact is 100.

The environmental significance of any identified potential impact is then rated as either: high, moderate or low on the following basis:

- More than 60 significance value indicates a high (H) environmental significance impact;
- Between 30 and 60 significance value indicates a moderate (M) environmental significance impact; and
- Less than 30 significance value indicates a low (L) environmental significance impact.

In order to assess the degree to which the potential impact can be reversed and be mitigated, each identified potential impact will need to be assessed twice.

- Firstly, the potential impact will be assessed and rated prior to implementing any mitigation and management measures; and
- Secondly, the potential impact will be assessed and rated after the proposed mitigation and management measures have been implemented.

The purpose of this dual rating of the impact before and after mitigation is to indicate that the significance rating of the initial impact is and should be higher in relation to the significance of the impact after mitigation measures have been implemented. In order to assess the degree to which the potential impact can cause irreplaceable loss of resources¹⁴, the following classes (%) will be used:

- 5 100% - Permanent loss
- 4 75% - 99% - significant loss
- 3 50% - 74% - moderate loss
- 2 25% - 49% - minor loss
- 1 0% - 24% - limited loss.

11.4 The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected.

The main environmental disturbance/ impact will occur during the pre-construction and construction phases of the project as a result of clearing the area as well as the movement of construction vehicles and trucks on the sites.

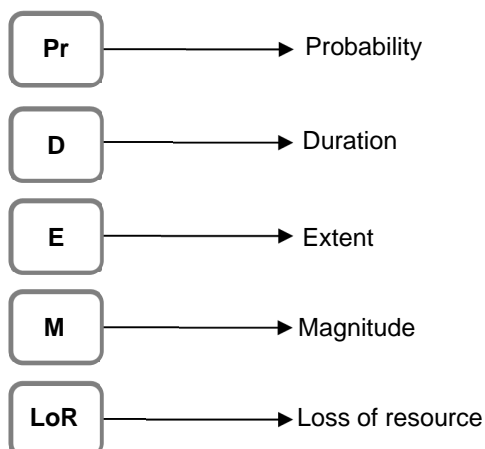
Since Mogalakwena Complex is already an operational mine there are very few additional environmental and social impacts arising from the proposed projects.

¹⁴ The Loss of Resources aspect will not affect the overall significance rating of the impact.

The rating of impacts, as per the methodology described in Section 11.3, is also provided. In addition, mitigation measures that may alleviate or result in avoidance of the potential impacts have been included.

The following sections provide further details on the potential impacts (negative and positive), in terms of the various environmental and social aspects for each aforesaid activity and the associated actions that will be undertaken during the implementation of the project.

The potential identified impacts were rated, as discussed in Section 11.3, in terms of the Probability, Duration, Extent and Magnitude that may be associated with the potential impact. The following abbreviations were used in the impact assessment tables to indicate the said impact assessment aspects:



11.4.1 Pre-construction phase

Table 11-3 list the main project related activities that will be undertaken during the pre-construction phase of the projects.

Table 11-3: Main project related activities during the pre-construction phase

Pre-assembly yard	Cable yard
<ul style="list-style-type: none"> Site clearing and grubbing of the footprint areas associated with the pre-assembly yard area in preparation for constructing of hardstanding and placement of temporary infrastructure (containerised buildings, parking areas, water tanks, fencing etc). 	<ul style="list-style-type: none"> Site clearing and grubbing of the footprint areas associated with the cable yard area in preparation for constructing the foundations associated with the workshop building, concrete laydown area, parking areas, fencing etc).
<ul style="list-style-type: none"> Removal and stockpiling of topsoil 	<ul style="list-style-type: none"> Excavation and removal of all vegetation, topsoil and sub-soil down to required level.

The pre-construction activities may only commence once environmental authorisation has been obtained and when the actions listed in Table 11-6 have been completed.

Table 11-4: Pre-construction actions prior to commencement with activities

Pre-assembly yard	Cable yard
<ul style="list-style-type: none"> Phase 1 Palaeontology assessment Implementation of the heritage watching brief and mitigations as recommended by the specialist (Appendix E) Biodiversity summer survey Engagement with herders currently using the area for grazing of livestock 	<ul style="list-style-type: none"> Phase 1 Palaeontology assessment Implementation of the heritage watching brief Biodiversity summer survey

Table 11-5: Pre-construction impacts applicable to during site clearing and grubbing of the proposed pre-assembly yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR				P	D	E	M	LoR				
Geology	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Topography	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Soils, land use and land capability	Vegetation clearing within the pre-assembly yard footprint as part of the site preparation prior to commencement, may lead to soil erosion. Loose soils may also wash down gradient into the Groot-Sandsloot (Pholotsi) River which will impact on water quality		3	4	2	6	3	36	Moderate	<ul style="list-style-type: none"> The footprint to be cleared must be kept as small as possible in order to minimise impact on the surrounding environment The footprint of the proposed infrastructure areas will be clearly demarcated to restrict vegetation clearing activities as far as practically possible Clearing of vegetation will take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential Moisture control will be necessary on large bare areas during dry season construction, in order to reduce the frequency and amount of dust suspended in the ambient air All disturbed areas adjacent to the infrastructural areas can be re-vegetated with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emission. This can be achieved by conducting a vegetation assessment. Soils from the footprint to be cleared must be stripped and stockpiled within existing topsoil stockpile areas for use during rehabilitation Stockpiles must be revegetated to establish a vegetation cover as an erosion control measure and be managed in line with the Alien and Invasive Plant (AIP) Management/ Control process for Mogalakwena Complex. Burying or burning of any waste including rubble, domestic waste, empty containers on the site will be strictly prohibited and all waste must be removed to approved waste management facilities. 	2	4	1	4	1	18	Low	50.0
Floral ecology and indigenous vegetation	Potential failure to conduct a walkdown of the authorised footprint area before construction activities commence where floral Species of Conservation Concern (SCC), where present, are marked and relocated to suitable habitat outside the development footprint prior to the construction phase		4	2	2	6	2	40	Moderate	<ul style="list-style-type: none"> If SCC, that are not Red Data Listed (RDL) species are encountered and will be affected by the construction activities, these species must, as far as is possible, be relocated to suitable habitat surrounding the disturbance footprint. If RDL species are encountered, avoidance is the best mitigation Before any construction activities can occur, a detailed walk down of the area must take place, during which all NFA-protected tree species should be marked and permits applied for to remove / cut / destroy these species Permits from the relevant authorities, i.e., LEDET and DFFE should be obtained before removal, cutting or destruction of protected species or TOPS before any proposed vegetation clearing activities may take place 	3	1	1	4	1	18	Low	55.0

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)			
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance				
	<p>Potential failure to comply with national and regional legislative requirements regarding permit applications, including timeously liaising with national and provincial competent authorities, for the removal / destruction of species listed under:</p> <ul style="list-style-type: none"> •The list of Schedule 12 (Protected plants) under the Limpopo Environmental Management Act, 2003 (Act 7 of 2003) (LEMA); •The List of Protected Tree Species (GN 536 OF 2018) as it relates to the National Forest Act (Act 84 of 1998) (NFA); and •The NEMBA TOPS list (Government Gazette [GN] 29657, as amended in GN R1187 in Government Gazette 30568 of 2007 and again in GN 627 in Government Gazette 43386 of 2020) <p>This will result in unnecessary or unlawful destruction/removal of floral SCC leading to a decline in the numbers of NFA-Protected Tree species (particularly <i>Sclerocarya birrea</i> subsp. <i>caffra</i>, <i>Elaodendron transvaalse</i>) and/or potential TOPS-Protected floral species</p>	Negative	4	2	2	6	2	40	Moderate		3	1	1	4	1	18	Low	55.0
	<p>Inconsiderate planning of infrastructure placement and design, leading to the loss of intact floral habitat, as well as unnecessary edge effect impacts (e.g., ongoing alien vegetation spread and bush encroachment) within areas outside of the proposed development footprint.</p>	Negative	4	3	2	6	2	44	Moderate	<ul style="list-style-type: none"> • Planned footprint area must be optimised, ensuring that the layout is as small as possible and does not encroach upon any neighbouring floral communities • Design of infrastructure should be environmentally sound, and all possible precautions taken to prevent potential spills and /or leaks. All spills and /or leaks from equipment must be immediately remedied and cleaned up to ensure that these chemicals do not enter the soils in accordance with the existing spills procedure. 	3	2	1	4	1	21	Low	52.3
	<p>Potential failure to update the AIP Management/Control plan for the footprint area before the commencement of construction activities.</p>	Negative	4	3	2	8	2	52	Moderate	<ul style="list-style-type: none"> • Prior to the commencement of construction activities on site, the existing alien and invasive plant control plan for the mine should be updated and implemented throughout all phases of the proposed pre-assembly project: <ul style="list-style-type: none"> i) Cleared vegetation and removed soil that will not be used again (e.g., in rehabilitation) should be removed to a registered waste facility where alien propagules will not spread further into natural habitat; and ii) It is highly recommended that the AIP Management/ Control Plan should be implemented by an experienced professional. • Only registered chemicals may be used during any carried out chemical control of AIPs 	3	2	1	6	1	27	Low	48.1

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation							Degree of mitigation (%)	
		P	D	E	M	LoR	Significance	P		D	E	M	LoR	Significance				
	Potential failure to draw up and get approval for the required plans to mitigate impacts before and at the commencement of construction activities: •Failure to draw up and get approval for an Erosion Control Plan; •Failure to draw up and get approval for a Rehabilitation Plan to be implemented before the commencement of construction. This will result in: •Extensive and unnecessary loss of floral habitat, leading to a decline in floral diversity, including a decline in floral SCC numbers within the study area, including species such as <i>Sclerocarya birrea</i> subsp. <i>caffra</i> , <i>Elaodendron transvaalse</i> . •Inability of vegetation to recover due to a lack of, or untimely, implementation of a well-conceived rehabilitation plan.	Negative	4	3	2	8	2	52	Moderate	<ul style="list-style-type: none"> Ensure that sound environmental management is in place during the planning phase Prior to the commencement of construction activities, the entire development footprint area, should be fenced off and clearly demarcated Prior to the commencement of construction activities on site, a rehabilitation plan should be developed for implementation throughout the pre-assembly laydown development phases (accommodating concurrent rehabilitation) 	3	2	1	6	1	27	Low	48.1
Freshwater ecosystem	Due to the distance of the Groot Sandstoot (Pholotsi) River from the study area, as well as the presence of informal 'buffers' including a 10 m gravel road and dense vegetation between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.								<ul style="list-style-type: none"> Vegetation clearing to be limited to the proposed project footprint areas including those associated with any proposed stormwater infrastructure, and vegetation outside of the study area, particularly to the south, must remain intact to retain a natural buffer zone Topsoil stripped within the study area must be stockpiled for rehabilitation, and stockpiles must be located in the northern portion of the study area Topsoil stockpile slope monitoring should be carried out regularly to manage the slope angle and height. The slope of the stockpile areas should not be excessively steep in order to minimise erosion risk Dust suppression measures must be put into place during site clearing and vegetation removal activities It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water on the mine 									
Noise	Noise increase due to clearing activities	Negative	2	2	2	4	2	16	Low	Pre-construction activities at the footprint area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine are not exceeded.	1	2	2	4	1	8	Low	50.0
	Noise increase due to clearance machinery and vehicles along the routes to and from the site.	Negative	2	3	2	4	2	18	Low	Pre-construction activities at the footprint area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine are not exceeded.	1	2	2	4	1	8	Low	55.6
Air Quality	Dust and gaseous generation from clearing of land, levelling of ground, vehicle entrainment of dust on roads and vehicle tailpipe emissions potentially resulting in nuisance and health effects on nearby receptors	Negative	2	3	2	4	2	18	Low	<ul style="list-style-type: none"> Apply dust suppressants or vegetate bare areas not being used for construction. Locate soil stockpiles within site boundaries considering the location of potential sensitive receptors and the predominant wind direction Set speed limits to minimise the creation of fugitive dust within the project boundary. Continuation of routine air quality monitoring (refer to Section 27.5.3) using Mogalakwena Complex's existing monitoring network specifically at monitoring points located in close proximity to the proposed project area 	2	3	1	4	1	16	Low	11.1

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance			
Cultural heritage	Impact of clearance activities on possible unmarked graves at site MPAY-01 (Complete destruction of site MPAY- 01, where the risk exists for graves to be located)	3	5	3	8	3	48	Moderate	<ul style="list-style-type: none"> Depending on the final development footprints and requirements of the mine, the following two options with their proposed mitigation measures are of reference: 	2	5	2	4	2	22	Low	54.2
									<p>Option 1: Preserve site MPAY-01 in situ.</p> <p>In terms of this option, the only requirement would be for a 100m wide buffer area to be kept clear of any development around the site. This 100m wide buffer area must be calculated around each of the four coordinates provided in the site description in Section 6.2.1 of the Heritage assessment (Appendix E)</p>								
									<p>Option 2: Mitigate the possible risk for the presence of Unmarked Graves. In terms of this option, the mitigation measures outlined below will be required:</p> <p>A social consultation process to assess whether any local residents or the wider public is aware of the presence of graves at these sites. Depending on the outcome of the social consultation process, three different outcomes would be the result, namely:</p> <p>Outcome 1: The social consultation absolutely confirms that no graves are located here. No further grave-related mitigation would be required.</p> <p>Outcome 2: The social consultation absolutely confirms that graves are located here. A grave relocation process must be undertaken and a detailed social consultation process, at least 60 days in length, comprising the attempted identification of the next-of-kin in order to obtain their consent for the relocation. The following mitigation measures would be required for sites falling under Outcome 2:</p> <ul style="list-style-type: none"> - Bilingual site and newspaper notices indicating the intent of the relocation. - Permits from all the relevant and legally required authorities. - An exhumation process that keeps the dignity of the remains and family intact. - An exhumation process that safeguards the legal rights of the families as well as that of the mining company. - The process must be done by a reputable company well versed in the mitigation of graves. <p>Outcome 3: The social consultation does not yield any confident results. The following mitigation measures would be required for sites falling under Outcome 3:</p> <ul style="list-style-type: none"> - Test excavations to physically confirm the presence or absence graves. - If no evidence for graves is found, the site will fall within Outcome 1 as outlined above. This means that no further mitigation measures would be required. - If evidence for graves is found, the site will fall within Outcome 2 as outlined above. This means 								

Negative

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	P			D	E	M	LoR	Significance				
									that a full grave relocation process must be implemented.									
									<ul style="list-style-type: none"> Additionally, the following mitigation measures must be undertaken for all these sites: <ul style="list-style-type: none"> - All structures and site layouts from each site must be recorded using standard survey methods. The end result would be site layout plans for all these sites placed on the operational master plan. - A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report. - The completed mitigation report must be submitted to the relevant heritage authorities. 									
	Impact of clearance activities on possible unmarked graves that may be located within the study area. Although no evidence for homesteads could be identified during the fieldwork, the risk still exists for unmarked graves associated with these homesteads to be located within the study area.	Negative	2	5	3	8	3	32	Moderate	<ul style="list-style-type: none"> An archaeological watching brief must be implemented during the entire initial period when the surface of the site is cleared of vegetation, graded and levelled During the watching brief, which will be undertaken during the early stages of the construction, the archaeologist must be allowed to provide guidance and instructions to the construction team as to the depth and extent at which grading activities are undertaken. This is to ensure that the initial disturbance from the graders and machinery do not impact at such a depth to destroy any evidence for graves An archaeological watching brief report must be compiled and submitted to SAHRA after the end of the watching brief 	2	5	2	4	2	22	Low	31.3
Palaeontology	Only the site will be affected by the proposed development. The proposed development will have a negative impact on Fossil Heritage if any fossils are found to exist.	Negative	4	5	1	10	5	64	High	It is recommended that a phase 1 field-based assessment report be conducted to assess the value and prominence of fossils in the development area and the effect of the proposed development on the paleontological heritage. Only then can practical mitigation measures be put in place depending on the findings of the assessment.	4	5	1	10	5	64	High	0.0
Geohydrology	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance			
Surface water hydrology	Reduction in water quality within the Groot-Sandsloot (Pholotsi) River due to an increase in turbidity as a result of an increase in erosion from the clearing of areas							<ul style="list-style-type: none"> All site preparation activities must remain outside of the freshwater systems. This includes the 100m zones of regulations or the 1:100-year floodlines for the Groot-Sandsloot (Pholotsi) River (refer to Appendix F) Vegetation clearance will be undertaken in a phased manner Clean water diversion bunds will be constructed upstream of the construction site prior to clearing areas for new infrastructure but will be located outside the 1:100-year floodlines Areas disturbed by pre-construction activities, which will not be required for construction, will be rehabilitated immediately on completion of construction of each area Bunded containment will be provided for hazardous materials, such as fuel and oil Spill-sorb or a similar product will be kept on site and used to clean up hydrocarbon spills in the event that they will occur The groundwater and surface water quality monitoring will continue in line with requirements of the Water Use Licence (refer to Figure 10-31 for monitoring points in close proximity to the proposed projects) Provide sufficient on-site ablution (albeit temporary in nature). The portable toilets need to be emptied daily and sewage disposed of at the existing STP at Mogalakwena Complex Topsoil and subsoil stockpiles must be managed in accordance with the existing approved Environmental Management Programme 									
	Negative	3	4	2	6	3	36		Moderate	2	4	1	4	2	18	Low	50.0
Socio-economic	During the field assessment it was noted (as well as discussed with herders present) that the pre-assembly yard area was being utilised for grazing of community livestock (cattle, goats, donkeys and horses). Fencing off of this area for the pre-assembly yard activities will result in a loss of grazing areas.							<p>It is recommended that the Social Performance team make contact with the affected community members/herders as part of Mogalakwena Complex's ongoing community engagement to understand what grazing land requirements and mitigation of the impact that the proposed pre-assembly yard will have on the use of the existing area for grazing.</p>									
	Negative	5	5	1	8	4	70		High	5	5	1	8	5	70	High	0.0
	Reduced air quality and increase in dust (site) due to clearance activities							<ul style="list-style-type: none"> Incorporate activities associated with the proposed project into the site Community Health and Safety Management Plan Include participatory monitoring of community health and safety risks and impacts in management plans Maintain current dust management monitoring measures as per the EMP Ensure dust levels are below the respective standards Raise awareness amongst surrounding communities on the available grievance mechanisms Implement dust suppression methods for vehicles such as dampening the roads Dust must be monitored in line with the current monitoring programme at Mogalakwena Complex (i.e. monthly) Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive receptors, taking account of prevailing wind directions and seasonal variations in the prevailing wind directions 									
	Negative	3	2	1	4	1	21		Low	2	2	1	2	1	10	Low	52.4

Table 11-6: Pre-construction impacts applicable to during site clearing and grubbing of the proposed cable yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)			
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance				
Geology	The clearing of the proposed cable yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.							No mitigation measures are required as no material impact is anticipated.										
Topography	The clearing of the proposed cable yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.							No mitigation measures are required as no material impact is anticipated.										
Soils, land use and land capability	Vegetation clearing within the cable yard footprint as part of the site preparation prior to commencement, may lead to soil erosion. Loose soils may also wash into the Mhlosane River which will impact on water quality.	Negative	3	4	2	6	3	36	Moderate	<ul style="list-style-type: none"> The footprint to be cleared must be kept as small as possible in order to minimise impact on the surrounding environment The footprint of the proposed infrastructure areas will be clearly demarcated to restrict vegetation clearing activities as far as practically possible Clearing of vegetation will take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential Moisture control will be necessary on large bare areas during dry season construction, in order to reduce the frequency and amount of dust suspended in the ambient air All disturbed areas adjacent to the infrastructural areas can be re-vegetated with an indigenous grass mix, to re-establish a protective cover, in order to minimise soil erosion and dust emission. This can be achieved by conducting a vegetation assessment. Soils from the footprint to be cleared must be stripped and stockpiled within existing topsoil stockpile areas for use during rehabilitation Stockpiles must be revegetated to establish a vegetation cover as an erosion control measure and be managed in line with the Alien and Invasive Plant (AIP) Management/ Control process for Mogalakwena Complex. Burying or burning of any waste including rubble, domestic waste, empty containers on the site will be strictly prohibited and all construction rubble waste must be removed to an approved disposal site 	2	4	1	4	1	18	Low	50.0
Floral ecology and indigenous vegetation	Potential failure to conduct a walkdown of the authorised footprint area before construction activities commence where floral SCC, where present, are marked and relocated to suitable habitat outside the development footprint prior to the construction phase.	Negative	4	2	2	6	2	40	Moderate	<ul style="list-style-type: none"> If SCC, that are not RDL species are encountered and will be affected by the construction activities, these species must, as far as is possible, be relocated to suitable habitat surrounding the disturbance footprint. If RDL species are encountered, avoidance is the best mitigation Before any construction activities can occur, a detailed walk down of the area must take place, during which all NFA-protected tree species should be marked and permits applied for to remove / cut / destroy these species 	3	1	1	4	1	18	Low	55.0

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)			
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance				
	<p>Potential failure to comply with national and regional legislative requirements regarding permit applications, including timeously liaising with national and provincial competent authorities, for the removal / destruction of species listed under:</p> <ul style="list-style-type: none"> •The list of Schedule 12 (Protected plants) under the Limpopo Environmental Management Act, 2003 (Act 7 of 2003) (LEMA); •The List of Protected Tree Species (GN 536 OF 2018) as it relates to the National Forest Act (Act 84 of 1998) (NFA); and •The NEMBA TOPS list (Government Gazette [GN] 29657, as amended in GN R1187 in Government Gazette 30568 of 2007 and again in GN 627 in Government Gazette 43386 of 2020). <p>This will result in unnecessary or unlawful destruction/removal of floral SCC leading to a decline in the numbers of NFA-Protected Tree species (particularly <i>Sclerocarya birrea</i> subsp. <i>caffra</i>, <i>Elaodendron transvaalse</i>) and/or potential TOPS-Protected floral species.</p>	Negative	4	2	2	6	2	40	Moderate	<ul style="list-style-type: none"> • Permits from the relevant authorities, i.e., LEDET and DFFE should be obtained before removal, cutting or destruction of protected species or TOPS species before any proposed vegetation clearing activities may take place 	3	1	1	4	1	18	Low	55.0
	<p>Inconsiderate planning of infrastructure placement and design, leading to the loss of intact floral habitat, as well as unnecessary edge effect impacts (e.g., ongoing alien vegetation spread and bush encroachment) within areas outside of the proposed development footprint.</p>	Negative	4	3	2	6	2	44	Moderate	<ul style="list-style-type: none"> • Planned footprint area must be optimised, ensuring that the layout is as small as possible and does not encroach upon any neighbouring floral communities • Design of infrastructure should be environmentally sound, and all possible precautions taken to prevent potential spills and /or leaks. All spills and /or leaks from equipment must be immediately remedied and cleaned up to ensure that these chemicals do not enter the soils in accordance with the existing spills procedure 	3	2	1	4	1	21	Low	52.3
	<p>Potential failure to draft an updated Alien and Invasive Plant (AIP) Management/Control plan for the footprint area before the commencement of construction activities.</p>	Negative	4	3	2	8	2	52	Moderate	<ul style="list-style-type: none"> • Prior to the commencement of construction activities on site, the existing alien and invasive plant control plan for the mine should be updated and implemented throughout all phases of the proposed pre-assembly project: <ul style="list-style-type: none"> i) Cleared vegetation and removed soil that will not be used again (e.g., in rehabilitation) should be disposed of at a registered waste facility where alien propagules will not spread further into natural habitat; and ii) It is highly recommended that the AIP Management/ Control Plan should be implemented by an experienced professional. • Only registered chemicals may be used during any carried out chemical control of AIPs 	3	2	1	6	1	27	Low	48.1

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	Significance	P		D	E	M	LoR	Significance				
	<p>Potential failure to draw up and get approval for the required plans to mitigate impacts before and at the commencement of construction activities:</p> <ul style="list-style-type: none"> - Failure to draw up and get approval for an Erosion Control Plan - Failure to draw up and get approval for a Rehabilitation Plan to be implemented before the commencement of construction. This will result in: <ul style="list-style-type: none"> - Extensive and unnecessary loss of floral habitat, leading to a decline in floral diversity, including a decline in floral SCC numbers within the study area, including species such as <i>Sclerocarya birrea</i> subsp. <i>caffra</i>, <i>Elaodendron transvaalse</i>). - Inability of vegetation to recover due to a lack of, or untimely, implementation of a well-conceived rehabilitation plan. 	Negative	4	3	2	8	2	52	Moderate	<ul style="list-style-type: none"> • Ensure that sound environmental management is in place during the planning phase • Prior to the commencement of construction activities, the entire development footprint area, should be fenced off and clearly demarcated • Prior to the commencement of construction activities on site, a rehabilitation plan should be developed for implementation throughout the pre-assembly laydown development phases (accommodating concurrent rehabilitation) 	3	2	1	6	1	27	Low	48.1
Freshwater ecosystem	<p>Due to the distance of the Mohlosane River from the study area, as well as the presence of 'buffers' such as dense vegetation and altered topography resulting from historical mining activities between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.</p>								<ul style="list-style-type: none"> • Vegetation clearing to be limited to the proposed project footprint areas including those associated with any proposed stormwater infrastructure, and vegetation outside of the study area, particularly to the south, must remain intact to retain a natural buffer zone • Topsoil stripped within the study area must be stockpiled for rehabilitation, and stockpiles must be located in the northern portion of the study area. Topsoil stockpile slope monitoring should be carried out regularly to manage the slope angle and height. The slope of the stockpile areas should not be excessively steep in order to minimise erosion risk • Dust suppression measures must be put into place during site clearing and vegetation removal activities • It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) • Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow • "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine. 									
Noise	Noise increase due to clearing activities	Negative	2	2	2	4	2	16	Low	Pre-construction activities at the footprint area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine are not exceeded.	1	2	2	4	1	8	Low	50.0
	Noise increase due to clearance machinery and vehicles along the routes to and from the site.	Negative	2	3	2	4	2	18	Low	Pre-construction activities at the footprint area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine are not exceeded.	1	2	2	4	1	8	Low	55.6
Air Quality	Dust and gaseous generation from clearing of land, levelling of ground, vehicle entrainment of dust on roads and vehicle tailpipe emissions potentially resulting in nuisance and health effects on nearby receptors	Negative	2	3	2	4	2	18	Low	<ul style="list-style-type: none"> • Apply dust suppressants or vegetate bare areas not being used for construction. • Locate soil stockpiles within site boundaries considering the location of potential sensitive receptors and the predominant wind direction • Set speed limits to minimise the creation of fugitive dust within the project boundary. • Continuation of routine air quality monitoring (refer to Section 27.5.3) using Mogalakwena Complex's existing monitoring network (Figure 10-23) specifically at monitoring points located in close proximity to the proposed project area 	2	3	1	4	1	16	Low	11.1

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation							Degree of mitigation (%)	
		P	D	E	M	LoR	Significance	P		D	E	M	LoR	Significance				
Cultural heritage	As far as can be ascertained from the available old aerial photographs, the old mining remains extend a bit into the north-western corner of the development footprint area. If the construction of the proposed Cable Repair Workshop is undertaken within the development footprints, only a minor impact on the old mining remains would be expected. This is said as only a small section of the old mining remains visible on the old aerial photographs are located within the present study area.	Negative	3	2	3	4	2	27	Low	As far as can be ascertained from the available old aerial photographs, the old mining remains extend a bit into the north-western corner of the development footprint area. As such only a small section of the old mining remains would be impacted by the proposed development. The result of the impact assessment calculation means that no mitigation measures would be required for this risk. It is important to note that no mitigation measures are suggested only for the small section of old mining remains that are located within the study area boundaries. Any expansion of the study area boundaries would necessarily require additional fieldwork and an amendment of this report, with possibly additional mitigation measures.	2	5	2	4	2	22	Low	18.5
	Impact of clearance activities on possible unmarked graves that may be located within the study area. Although no evidence for homesteads could be identified during the fieldwork, the risk still exists for unmarked graves associated with these homesteads to be located within the study area.	Negative	2	5	3	8	3	32	Moderate	<ul style="list-style-type: none"> An archaeological watching brief must be implemented during the entire initial period when the surface of the site is cleared of vegetation, graded and levelled During the watching brief, which will be undertaken during the early stages of the construction, the archaeologist must be allowed to provide guidance and instructions to the construction team as to the depth and extent at which grading activities are undertaken. This is to ensure that the initial disturbance from the graders and machinery do not impact at such a depth to destroy any evidence for graves An archaeological watching brief report must be compiled and submitted to SAHRA after the end of the watching brief 	2	5	2	4	2	22	Low	31.3
Palaeontology	Only the site will be affected by the proposed development. The proposed development will have a negative impact on Fossil Heritage if any fossils are found to exist.	Negative	4	5	1	10	5	64	High	It is recommended that a phase 1 field-based assessment report be conducted to assess the value and prominence of fossils in the development area and the effect of the proposed development on the paleontological heritage. Only then can practical mitigation measures be put in place depending on the findings of the assessment.	4	5	1	10	5	64	High	0.0
Geohydrology	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	Reduction in water quality within the Mhlosane River due to an increase in turbidity as a result of an increase in erosion from the clearing of areas	Negative	3	4	2	6	3	36	Moderate	<ul style="list-style-type: none"> All site preparation activities must remain outside of the freshwater systems. This includes the 100m zones of regulations or the 1:100-year floodlines for the Mhlosane River (refer to Appendix F) Vegetation clearance will be undertaken in a phased manner Clean water diversion bunds will be constructed upstream of the construction site prior to clearing areas for new infrastructure but will be located outside the 1:100-year floodlines Areas disturbed by pre-construction activities, which will not be required for construction, will be rehabilitated immediately on completion of construction of each area Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil Spill-sorb or a similar product will be kept on site and used to clean up hydrocarbon spills in the event that they will occur The groundwater and surface water quality monitoring will continue in line with requirements of the Water Use Licence (refer to Figure 27-1 for surface and groundwater monitoring points located in close proximity to the proposed project) Provide sufficient on-site ablution (albeit temporary in nature). The portable toilets need to be emptied daily and sewage disposed of at the existing STP at Mogalakwena Complex Topsoil and subsoil stockpiles must be managed in accordance with the existing approved Environmental Management Programme 	2	4	1	4	2	18	Low	50.0

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	Significance	P		D	E	M	LoR	Significance				
Socio-economic	Reduced air quality and increase in dust (site) due to clearance activities	Negative	3	2	1	4	1	21	Low	<ul style="list-style-type: none"> Incorporate activities associated with the proposed project into the site Community Health and Safety Management Plan Include participatory monitoring of community health and safety risks and impacts in management plans Maintain current dust management monitoring measures as per the EMP Ensure dust levels are below the respective standards Raise awareness amongst surrounding communities on the available grievance mechanisms Implement dust suppression methods for vehicles such as dampening the roads Dust must be monitored in line with the current monitoring programme at Mogalakwena Complex (i.e. monthly) Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive receptors, taking account of prevailing wind directions and seasonal variations in the prevailing wind directions 	2	2	1	2	1	10	Low	52.4

11.4.2 Construction phase

The table below list the main project related activities that will be undertaken during the construction phase of the proposed project.

Pre-assembly yard	Cable yard
Placement of temporary/containerised buildings (kwikspace or similar) including offices, messing facilities, portable toilets, document & data storage, under roof equipment and materials storage.	Construction of the foundations, floor slabs and sub columns including all shuttering, installation of steel reinforcement, concrete pouring, finishing of concrete and all cutting and casting of joints.
Installation of temporary water tanks for the provision of drinking water and to service the ablutions.	Installation of the conservancy tank for temporary sewage effluent management.
Reticulation of power and IT networks between the above areas/containerised offices and in the installation of area lighting where required.	Shaping of external platform including roads, parking, and aprons to manage run-off water away from the facility.
Construction of a perimeter fence on the boundary of the area including access gates and turnstiles as well as the construction of limited fencing inside the boundary to allow more secure storage of materials and to demarcate areas between difference contractors.	Construction of the exterior and interior masonry walls.
Establishment of turn off points from the MNC access road and Ga-Molekana access road	Install steel columns, rafters and roof trusses including the required bracing and fixing elements. Complete with sheeting for roof covering and side cladding.
Establishment of parking areas.	Installation of potable water and sewer connections to the conservancy tank and reticulation in line with engineering designs.
Establishment of level open areas in order to place and temporarily store equipment earmarked for the construction of M3C. Equipment will be placed/stored on pallets, other appropriate dunnage or crates.	Installation of transformer, trunking, cabling and wiring for plugs and lights.
Establishment of level open areas in order to place and temporarily store materials for the construction of M3C.	Establishment of turn off points from the MNC access road
Establishment of material stores (temporary covered areas or buildings) to store sensitive materials earmarked for the construction of M3C.	
Monitoring of groundwater and surface water.	Handling of potential contaminated soils.
Handling of potential contaminated soils.	Monitoring of groundwater and surface water.

Table 11-7: Construction impacts applicable to the activities associated with the proposed pre-assembly yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation							Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	Significance	P		D	E	M	LoR	Significance				
Geology	Construction within the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Topography	Construction within proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Soils, land use and land capability	Loss of vegetative cover and topsoil protection - possible erosion, the permanent loss of resource downslope/downstream and impact of sedimentary load on streams and river systems	Negative	3	2	2	6	3	30	Moderate	<ul style="list-style-type: none"> Use of suitable grass as an erosion prevention medium ahead of clearing where erosion is a considered risk. 	2	2	1	4	2	14	Low	53.3

	Loss of soil resource and utilisation potential due to contamination by hydrocarbon/reagent spills and/or dirty water runoff	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Restriction/Minimisation of movement and servicing of vehicles, spillage from haulage systems and vehicles and bunding of all services areas 	2	2	1	4	2	14	Low	30.0
	Loss of soil utilisation potential and land capability due to leaching and de-nutrition of stripped and stockpiled soils	Negative	2	4	1	6	4	22	Low	<ul style="list-style-type: none"> Strip soils with vegetative cover in tacked (inclusive of seed pool and organic matter), stockpile utilisable soils separately from soft overburden, restrict stockpiles and berms in line with the requirements of the soil utilisation plan (Section 11.4.5) Vegetate and/or rock clad stores of soil and overburden and manage the ingress of dirty water and erosion 	2	4	1	4	2	18	Low	18.2
	Loss of resource and its utilisation potential due to compaction by heavy construction vehicles used over unprotected ground/soils	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Minimise the footprint of impact, restrict vehicle movement over unprotected soils and to areas of need, remove all (to depth) utilisable soil, stockpile and store prior to construction of facilities/structures Implement concurrent rehabilitation of all areas once usefulness is completed 	2	2	1	4	2	14	Low	30.0
Floral ecology and indigenous vegetation	Loss of floral diversity and habitat due to construction activities and vegetation clearing; i) Dumping of construction material within areas where no construction is planned; ii) Proliferation of alien invasive species within the footprint area due to pre-construction activities, spreading into the surrounding areas. This could lead to the potential loss of floral species within surrounding habitat areas.	Negative	4	3	3	6	3	48	Moderate	<ul style="list-style-type: none"> The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management) Removal of vegetation must be restricted to what is necessary and should remain within the approved development footprint If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil in line with the Spills Procedure. An AIP control plan must be implemented for areas cleared outside of the authorised footprint area. 	3	2	2	4	1	24	Low	50.0
	Loss of floral diversity and habitat due to potentially poorly managed edge effects such as i) Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to ongoing proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; ii) Compaction of soils outside of the study area due to indiscriminate driving of construction vehicles through natural vegetation; and iii) Habitat fragmentation because of construction activities leading to loss of floral diversity.	Negative	4	2	3	8	3	52	Moderate	<ul style="list-style-type: none"> Clearing of vegetation should take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential. Additionally, construction personnel and construction vehicles should be kept to the bare minimal per site to reduce the construction footprint and potential of soil compaction. Vehicles should be restricted to travelling only on designated roadways to limit the footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal. Care should be taken during the construction phase of the proposed development to limit edge effects to surrounding natural habitat. At a minimum, this can be achieved by: i) Demarcating all footprint areas during construction and operational activities; ii) No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste management facility; iii) All soils compacted because of construction or mining activities should be ripped and profiled and reseeded; iv) Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare because of the construction and mining activities should be rehabilitated using indigenous species. 	3	1	2	2	1	15	Low	71.2
	Loss of floral SCC from the study area for the following reasons: i) Potential failure to monitor relocation success of occurring and potential occurring floral SCC (relocation must have taken place before construction phase); and ii) Harvesting of floral SCC outside of the construction footprint by construction personnel.	Negative	4	4	2	6	2	48	Moderate	<ul style="list-style-type: none"> No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered) Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area. 	3	3	1	4	1	24	Low	50.0

	Loss of floral diversity and habitat due to construction and operational activities: i) Destruction of vegetation due to unplanned fires; ii) Dust generated during construction and operational activities accumulating on the surrounding floral individuals, altering the photosynthetic ability of plants, and potentially further decreasing optimal growing/re-establishing conditions.	Negative	3	3	3	6	2	36	Moderate	<ul style="list-style-type: none"> No illicit fires may be allowed during the construction of the proposed development. Where possible suppress dust to mitigate the impact of dust on flora within a close proximity of construction activities. 	2	2	2	4	1	16	Low	55.6
Freshwater ecosystem	Due to the distance of the Groot Sandstoot (Pholotsi) River from the study area, as well as the presence of informal 'buffers' including a 10 m gravel road and dense vegetation between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.									<ul style="list-style-type: none"> Dust suppression measures must be put into place during site clearing and vegetation removal activities It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine 								
Noise	Preparation of the footprint, digging of trenches, earthworks, and construction of the base of the M3C Pre-Assembly yard - Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	All noise sources on construction vehicles in excess of 85.0dBA at 1.0m from the noise source to be acoustically screened off. Noise monitoring to be done to ensure that the noise sources are identified on a pro-active manner (refer to Figure 10-22 for the noise measuring points where monitoring should be conducted for the proposed project).	2	2	2	4	3	16	Low	46.7
	Construction of the buildings and stores - Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	Construction activities at the project area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine is not exceeded. When the prevailing ambient noise is exceeded such activities will have to be acoustically screened of.	2	2	2	4	3	16	Low	46.7
	Construction vehicles travelling along the access roads resulting in a Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	Internal roads to be kept in a good condition and all potholes to be repaired. Noise monitoring to be done to ensure that the noise sources are identified on a pro-active manner	2	2	2	4	3	16	Low	46.7
Air Quality	Increase in dust and exhaust emissions due to the construction machinery operating and travelling on unsealed roads.	Negative	3	2	2	4	2	24	Low	<ul style="list-style-type: none"> Pave or treat road surfaces within the mine boundary to suppress dust entrained by vehicles. Surface treatment of roads should also be considered before and after a sensitive receptor Apply dust suppressants or vegetate bare areas not being used for construction Locate soil stockpiles within site boundaries considering the location of potential sensitive receptors and the predominant wind direction Set speed limits to minimise the creation of fugitive dust within the project boundary Continuation of routine air quality monitoring using Mogalakwena Complex's existing monitoring network specifically at monitoring points located in close proximity to the proposed project area 	2	2	2	2	1	12	Low	50.0
Cultural heritage	No further impacts expected									Mitigation measures resulting from the watching brief must be implemented. Implement the existing chance finds procedure to deal with how to protect graves and heritage sites accidentally unearthed during construction								
Palaeontology	No further impacts expected									Mitigation measures from the Phase 1 assessment to be undertaken must be implemented								
Geohydrology	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								

Surface water hydrology	Reduction in water quality within the Groot-Sandsloot (Pholotsi) River due to an increase in turbidity as a result of an increase in erosion from the cleared areas	Negative	3	4	2	6	3	36	Moderate	<ul style="list-style-type: none"> All construction activities must remain outside of the freshwater systems. This includes the 100m zones of regulations or the 1:100-year floodlines for the Groot-Sandsloot (Pholotsi) River Areas disturbed by pre-construction activities, which will not be required for construction, will be rehabilitated immediately on completion of construction of each area Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil Spill-sorb or a similar product will be kept on site and used to clean up hydrocarbon spills in the event that they will occur The groundwater and surface water quality monitoring will continue in line with requirements of the Water Use Licence Provide sufficient on-site ablution (albeit temporary in nature). The portable toilets need to be emptied daily and sewage disposed of at the existing STP at Mogalakwena Complex Topsoil and subsoil stockpiles must be managed in accordance with the existing approved Environmental Management Programme 	2	4	1	4	2	18	Low	50.0
Socio-economic	Reduced air quality and increase in dust (site)	Negative	3	2	1	4	1	21	Low	<ul style="list-style-type: none"> Incorporate activities associated with the proposed project into the site Community Health and Safety Management Plan Include participatory monitoring of community health and safety risks and impacts in management plans Maintain current dust management monitoring measures as per the EMP Ensure dust levels are below the respective standards Raise awareness amongst surrounding communities on the available grievance mechanisms Implement dust suppression methods for vehicles such as dampening the roads Dust must be monitored in line with the current monitoring programme at Mogalakwena Complex (i.e. monthly) Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive receptors, taking account of prevailing wind directions and seasonal variations in the prevailing wind directions 	2	2	1	2	1	10	Low	52.4
	Increase community and employee exposure to hazards and risks	Negative	2	2	2	2	1	12	Low	<ul style="list-style-type: none"> Incorporate project activities into the Mogalakwena Complex emergency response plan Keep First Aid supplies on site Undertake induction training as well as regular refresher training sessions on health and safety for employees Include the respective contractors (if applicable to the project) in the health and safety training Inform the employees of the emergency response plan in conjunction with the training. 	1	2	1	2	1	5	Low	58.3
	Potential temporary increase in job creation	Positive	2	2	2	6	1	20	Low	<ul style="list-style-type: none"> Emerging employment opportunities as part of general construction activities should be targeted at local residents as well as people from the surrounding communities in cases where the skills cannot be obtained from immediately adjacent communities Update commitments register on a regular basis 	3	2	2	6	1	30	Moderate	50.0

Table 11-8: Construction impacts applicable to the activities associated with the proposed cable yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation					Mitigation Measures	Significance of potential impact AFTER mitigation					Degree of mitigation (%)	
		P	D	E	M	LoR		Significance	P	D	E	M		LoR
Geology	Construction within the proposed cable yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.						No mitigation measures are required as no material impact is anticipated.							
Topography	Construction within of the proposed cable yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.						No mitigation measures are required as no material impact is anticipated.							

Soils, land use and land capability	Loss of vegetative cover and topsoil protection - possible erosion, the permanent loss of resource downslope/downstream and impact of sedimentary load on streams and river systems	Negative	3	2	2	6	3	30	Moderate	<ul style="list-style-type: none"> Minimisation of footprint of impact, use of high floatation tires on all construction vehicles, removal and storage of all utilisable soil and the re-vegetation Use of a suitable grass as an erosion prevention medium ahead of clearing where erosion is a considered risk. 	2	2	1	4	2	14	Low	53.3
	Loss of soil resource and utilisation potential due to contamination by hydrocarbon/reagent spills and/or dirty water runoff	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Restriction/Minimisation of movement and servicing of vehicles, spillage from haulage systems and vehicles and bunding of all services areas 	2	2	1	4	2	14	Low	30.0
	Loss of soil utilisation potential and land capability due to leaching and de-nutrition of stripped and stockpiled soils	Negative	2	4	1	6	4	22	Low	<ul style="list-style-type: none"> Strip soils with vegetative cover in tacked (inclusive of seed pool and organic matter), stockpile utilisable soils separately from soft overburden, restrict stockpiles and berms in line with the soil utilisation plan (refer to Section 11.4.5) Vegetate and/or rock clad stores of soil and overburden and manage the ingress of dirty water and erosion 	2	4	1	4	2	18	Low	18.2
	Loss of resource and its utilisation potential due to compaction by heavy construction vehicles used over unprotected ground/soils	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Minimise the footprint of impact, restrict vehicle movement over unprotected soils and to areas of need, remove all (to depth) utilisable soil, stockpile and store prior to construction of facilities/structures Implement concurrent rehabilitation of all areas once usefulness is completed 	2	2	1	4	2	14	Low	30.0
Floral ecology and indigenous vegetation	Loss of floral diversity and habitat due to construction activities and vegetation clearing; i) Dumping of construction material within areas where no construction is planned; ii) Proliferation of alien invasive species within the footprint area due to pre-construction activities, spreading into the surrounding areas. This could lead to the potential loss of floral species within surrounding habitat areas.	Negative	4	3	3	6	3	48	Moderate	<ul style="list-style-type: none"> The construction footprint must be kept as small as possible to minimise the impact on the surrounding environment (edge effect management) Removal of vegetation must be restricted to what is necessary and should remain within the approved development footprint If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil in line with the Spills Procedure. An AIP control plan must be implemented for areas cleared outside of the authorised footprint area. 	3	2	2	4	1	24	Low	50.0
	Loss of floral diversity and habitat due to potentially poorly managed edge effects such as i) Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to ongoing proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; ii) Compaction of soils outside of the study area due to indiscriminate driving of construction vehicles through natural vegetation; and iii) Habitat fragmentation because of construction activities leading to loss of floral diversity.	Negative	4	2	3	8	3	52	Moderate	<ul style="list-style-type: none"> Clearing of vegetation should take place in a phased manner as to keep bare soil areas as small as possible to limit the erosion potential. Additionally, construction personnel and construction vehicles should be kept to the bare minimal per site to reduce the construction footprint and potential of soil compaction. Vehicles should be restricted to travelling only on designated roadways to limit the footprint of the construction activities. Additional road construction should be limited to what is absolutely necessary, and the footprint thereof kept to a minimal. Care should be taken during the mining phase of the proposed development to limit edge effects to surrounding natural habitat. At minimum, this can be achieved by: i) Demarcating all footprint areas during construction and operational activities; ii) No construction rubble or cleared alien invasive species are to be disposed of outside of demarcated areas, and should be taken to a registered waste disposal facility; iii) All soils compacted because of construction or mining activities should be ripped and profiled and reseeded; iv) Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare because of the construction and mining activities should be rehabilitated using indigenous species. 	3	1	2	2	1	15	Low	71.2
	Loss of floral SCC from the study area for the following reasons: i) Potential failure to monitor relocation success of occurring and potential occurring floral SCC (relocation must have taken place before construction phase); and ii) Harvesting of floral SCC outside of the construction footprint by construction personnel.	Negative	4	4	2	6	2	48	Moderate	<ul style="list-style-type: none"> No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered) Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area. 	3	3	1	4	1	24	Low	50.0

	Loss of floral diversity and habitat due to construction and operational activities: i) Destruction of vegetation due to unplanned fires; ii) Dust generated during construction and operational activities accumulating on the surrounding floral individuals, altering the photosynthetic ability of plants, and potentially further decreasing optimal growing/re-establishing conditions.	Negative	3	3	3	6	2	36	Moderate	<ul style="list-style-type: none"> No illicit fires may be allowed during the construction of the proposed development. Where possible suppress dust to mitigate the impact of dust on flora within a close proximity of construction activities. 	2	2	2	4	1	16	Low	55.6
Freshwater ecosystem	Due to the distance of the Mhlosane River from the study area, as well as the presence of 'buffers' such as dense vegetation and altered topography resulting from historical mining activities between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.									<ul style="list-style-type: none"> Dust suppression measures must be put into place during site clearing and vegetation removal activities It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine. 								
Noise	Preparation of the footprint, digging of trenches, earthworks, and construction of the base of the proposed cable yard - Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	All noise sources on construction vehicles in excess of 85.0dBA at 1.0m from the noise source to be acoustically screened off. Noise monitoring to be done to ensure that the noise sources are identified on a pro-active manner (refer to Figure 10-22 for the noise measuring points within the proposed project area).	2	2	2	4	3	16	Low	46.7
	Construction of the buildings and stores - Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	Construction activities at the project area may be carried out during the day and night time provided that the prevailing ambient noise levels at the boundary of the mine is not exceeded. When the prevailing ambient noise is exceeded such activities will have to be acoustically screened of.	2	2	2	4	3	16	Low	46.7
	Construction vehicles travelling along the access roads resulting in a Noise increase in excess of the 70.0dBA threshold value along the MRA footprint	Negative	3	2	2	6	3	30	Moderate	Internal roads to be kept in a good condition and all potholes to be repaired. Noise monitoring to be done to ensure that the noise sources are identified on a pro-active manner	2	2	2	4	3	16	Low	46.7
Air Quality	Increase in dust and exhaust emissions due to the construction machinery operating and travelling on unsealed roads.	Negative	3	2	2	4	2	24	Low	<ul style="list-style-type: none"> Pave or treat road surfaces within the mine boundary to suppress dust entrained by vehicles. Surface treatment of roads should also be considered before and after a sensitive receptor Apply dust suppressants or vegetate bare areas not being used for construction Locate soil stockpiles within site boundaries considering the location of potential sensitive receptors and the predominant wind direction Set speed limits to minimise the creation of fugitive dust within the project boundary Continuation of routine air quality monitoring using Mogalakwena Complex's existing monitoring network specifically at monitoring points located in close proximity to the proposed project area 	2	2	2	2	1	12	Low	50.0
Cultural heritage	No further impacts expected									Mitigation measures resulting from the watching brief must be implemented. Implement the existing chance finds procedure to deal with how to protect graves and heritage sites accidentally unearthed during construction								
Palaeontology	No further impacts expected									Mitigation measures from the Phase 1 assessment to be undertaken must be implemented								
Geohydrology	The clearing of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								

Surface water hydrology	Reduction in water quality within the Mhlosane River due to an increase in turbidity as a result of an increase in erosion from the cleared areas	Negative	3	4	2	6	3	36	Moderate	<ul style="list-style-type: none"> All construction activities must remain outside of the freshwater systems. This includes the 100m zones of regulations or the 1:100-year floodlines for the Mhlosane River Clean water diversion bunds will be constructed downstream of the construction site prior to clearing areas for new infrastructure but will be located outside the 1:100-year floodlines Areas disturbed by pre-construction activities, which will not be required for construction, will be rehabilitated immediately on completion of construction of each area Bunded containment and settlement facilities will be provided for hazardous materials, such as fuel and oil Spill-sorb or a similar product will be kept on site and used to clean up hydrocarbon spills in the event that they will occur The groundwater and surface water quality monitoring will continue in line with requirements of the Water Use Licence Provide sufficient on-site ablution (albeit temporary in nature). The portable toilets need to be emptied daily and sewage disposed of at the existing STP at Mogalakwena Complex Topsoil and subsoil stockpiles must be managed in accordance with the existing approved Environmental Management Programme 	2	4	1	4	2	18	Low	50.0
Socio-economic	Reduced air quality and increase in dust (site)	Negative	3	2	1	4	1	21	Low	<ul style="list-style-type: none"> Incorporate activities associated with the proposed project into the site Community Health and Safety Management Plan Include participatory monitoring of community health and safety risks and impacts in management plans Maintain current dust management monitoring measures as per the EMP Ensure dust levels are below the respective standards Raise awareness amongst surrounding communities on the available grievance mechanisms Implement dust suppression methods for vehicles such as dampening the roads Dust must be monitored in line with the current monitoring programme at Mogalakwena Complex (i.e. monthly) Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive receptors, taking account of prevailing wind directions and seasonal variations in the prevailing wind directions 	2	2	1	2	1	10	Low	52.4
	Increase community and employee exposure to hazards and risks	Negative	2	2	2	2	1	12	Low	<ul style="list-style-type: none"> Incorporate project activities into the Mogalakwena Complex emergency response plan Keep First Aid supplies on site Undertake induction training as well as regular refresher training sessions on health and safety for employees Include the respective contractors (if applicable to the project) in the health and safety training Inform the employees of the emergency response plan in conjunction with the training. 	1	2	1	2	1	5	Low	58.3
	Potential temporary increase in job creation	Positive	2	2	2	6	1	20	Low	<ul style="list-style-type: none"> Emerging employment opportunities as part of general construction activities should be targeted at local residents as well as people from the surrounding communities in cases where the skills cannot be obtained from immediately adjacent communities Update commitments register on a regular basis 	3	2	2	6	1	30	Moderate	50.0

11.4.3 Operational phase

The table below list the main project related activities that will be undertaken during the operational phase of the proposed project.

Pre-assembly yard	Cable yard
The pre-assembly yard area will be operating 24 hours, 7 days a week to provide an allocated area to accommodate the laydown of equipment and materials as well as the pre-assembly of structures such as conveyor gantries and pipe racks required for the M3C.	The cable yard area will be operating 24 hours, 7 days a week to repair and maintain cables for primary mining equipment.
Mining vehicles will travel on the existing MNC access road as well as the Ga-Molekana access road in order to access the pre-assembly yard area and transport components of the M3C from the pre-assembly yard to the M3C footprint area.	Mining vehicles will travel to and from the cable yard area on existing mine roads to deliver broken cables to the workshop and transport repaired cables to various areas at the Complex.
Waste will be collected within the separation corner of the site in two skip bins for removal by an authorised waste management contractor in line with existing waste management practices at the Complex.	Waste will be collected within the separation corner of the site in two skip bins for removal by an authorised waste management contractor in line with existing waste management practices at the Complex.

Table 11-9: Operational impacts applicable to all the proposed pre-assembly yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	P			D	E	M	LoR	Significance				
Geology	Operation activities associated with the pre-assembly yard are unlikely to materially affect or be affected by the local geology. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Topography	Operation activities associated with the pre-assembly yard are unlikely to materially affect or be affected by the local topography. No material impact is anticipated.								No mitigation measures are required as no material impact is anticipated.									
Soils, land use and land capability	Continued loss of soil resource and its utilisation potential for all areas covered by infrastructure and operational areas	Negative	3	2	2	6	3	30	Moderate	<ul style="list-style-type: none"> Minimise footprint and restrict area of impact to as small an area as practical and manage all stockpiles of stripped soil for erosion and contamination Manage vegetative/rock cladding and impacts of dirty water/dust ingress 	2	2	1	4	2	14	Low	53.3
	Loss of resource due to unprotected overland flow of dirty water (suspended solids and possible hydrocarbons/reagents) and erosion of soils by water and/or wind - potential for offsite (downstream and downwind) contamination/impacts by dust and dirty water.	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Manage stockpiles and berms for vegetative cover to restrict erosion, and maintain and manage stormwater control systems to prevent erosion and ingress of dirty water 	1	2	1	4	2	7	Low	65.0
	On-going loss of soil utilisation potential from unprotected stockpiles and in-situ sites due to leaching of nutrient stores (inclusive of organic carbon stores)	Negative	2	2	2	6	3	20	Low	On-going monitoring and maintenance of vegetative cover/rock cladding to all material stockpiles and berms, concurrent rehabilitation of all non-essential or disused areas, and the maintenance of stormwater control systems.	1	2	1	4	2	7	Low	65.0
Floral ecology and indigenous vegetation	Loss of floral diversity and habitat due to construction activities and vegetation clearing; i) Dumping of construction material within areas where no construction is planned; ii) Proliferation of alien invasive species within the footprint area due to pre-construction activities, spreading into the surrounding areas. This could lead to the potential loss of floral species within surrounding habitat areas.	Negative	4	3	3	6	3	48	Moderate	<ul style="list-style-type: none"> If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil An AIP control plan must be implemented for areas cleared outside of the authorised footprint area. 	3	2	2	4	1	24	Low	50.0
	Loss of floral diversity and habitat due to potentially poorly managed edge effects such as i) Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to ongoing proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; ii) Compaction of soils outside of the study area due to indiscriminate driving of construction vehicles through natural vegetation; and iii) Habitat fragmentation because of construction activities leading to loss of floral diversity.	Negative	4	2	3	8	3	52	Moderate	<ul style="list-style-type: none"> Care should be taken during the operational phase of the proposed development to limit edge effects to surrounding natural habitat. At minimum, this can be achieved by: i) Demarcating all footprint areas during operational activities; iii) All soils compacted because of operational activities should be ripped and profiled and reseeded; iv) Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare because of the operational activities should be rehabilitated using indigenous species. 	3	1	2	2	1	15	Low	71.2

	Loss of floral SCC from the study area for the following reasons: i) Potential failure to monitor relocation success of occurring and potential occurring floral SCC (relocation must have taken place before construction phase); and ii) Harvesting of floral SCC outside of the construction footprint by construction personnel.	Negative	4	4	2	6	2	48	Moderate	<ul style="list-style-type: none"> No collection of indigenous floral species must be allowed by personnel, especially with regards to floral SCC (if encountered) Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area 	3	3	1	4	1	24	Low	50.0
	Loss of floral diversity and habitat due to construction and operational activities: i) Destruction of vegetation due to unplanned fires; ii) Dust generated during construction and operational activities accumulating on the surrounding floral individuals, altering the photosynthetic ability of plants, and potentially further decreasing optimal growing/re-establishing conditions.	Negative	3	3	3	6	2	36	Moderate	<ul style="list-style-type: none"> Where possible suppress dust to mitigate the impact of dust on flora within a close proximity of activities 	2	2	2	4	1	16	Low	55.6
Freshwater ecosystem	Due to the distance of the Groot Sandsloot (Pholotsi) River from the study area, as well as the presence of informal 'buffers' including a 10 m gravel road and dense vegetation between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.									<ul style="list-style-type: none"> Dust suppression measures must be put into place during operational activities It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine 								
Noise	Noise generated by the pre-assembly yard general activities, compressors, cranes, mobile generators etc resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint.	Negative	3	5	2	6	2	39	Moderate	All noise sources in excess of 85.0dBA to be acoustically screened off	2	5	2	4	1	22	Low	43.6
	Traffic to and from the pre-assembly yard resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint.	Negative	3	5	2	6	2	39	Moderate	Access roads to and from the project area to be kept in good order at all times.	2	5	2	4	1	22	Low	43.6
	Noise from the administrative buildings resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint	Negative	2	5	2	6	2	26	Low	All noise sources in excess of 85.0dBA to be acoustically screened off	2	5	2	4	1	22	Low	15.4

Air Quality	Dust generation potentially resulting in nuisance and health effects on nearby receptors due to materials handling, vehicle entrainment of dust on the haul roads and windblown dust from the open and bare areas	Negative	3	4	2	4	1	30	Moderate	<ul style="list-style-type: none"> Use dust suppression techniques such as wet suppression or chemical suppression (must be environmentally friendly and non-polluting) to reduce dust on roads that exhibit an increase of dust emitted from the entrainment of dust Design road alignments to minimise travel distances and eliminate unnecessary traffic Speed limits within the mine should be adhered to for both treated haul roads and unpaved roads Development and implementation of routine emissions and ambient air quality monitoring program to determine whether there are any significant increases in emissions and impacts at sensitive receptors 	2	4	2	2	1	16	Low	46.7
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	The operation of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	The operation of the proposed pre-assembly yard footprint is unlikely to materially affect the surface water resources. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	Increased community and employee exposure to hazards and risks	Negative	3	4	1	6	3	33	Moderate	<ul style="list-style-type: none"> Inform affected community about potential risks and impacts from the project activities in a culturally appropriate manner, including collaborating with the community and government agencies in their efforts to respond effectively to emergency situations Recruit and/or train staff who will be responsible for the implementation of health and safety in line with the Community Health and Safety Management Plan Minimize transmission of communicable diseases (e.g. Covid 19, HIV/Aids) that may be associated with the influx of temporary or permanent project labour by referencing existing Health Impact Assessments and updating the site Community Health and Safety Management Plan and Covid 19 Action Plan Incorporate project activities into the Mogalakwena Complex Emergency Response Plan and Community Health and Safety Management Plan Keep First Aid supplies on site Undertake induction training as well as regular refresher training sessions on health and safety for employees Include the respective contractors (if applicable to the project) in the health and safety training Inform the employees of the emergency response plan in conjunction with the training 	2	4	1	4	2	18	Low	45.5
	Limited employment creation and benefits	Negative	5	4	2	6	1	60	High	<ul style="list-style-type: none"> Emerging employment opportunities should be targeted at local residents as well as people from the surrounding communities in cases where the skills cannot be obtained from immediately adjacent communities Update commitments register on a regular basis Mogalakwena Complex should continue to provide the surrounding communities with practical skills training so that they have the opportunity to upskill themselves and apply for jobs with the mine. Recruitment of labour should be guided by AAP's recruitment policies which should promote the employment of local labour. The recruitment process must be transparent and communicated to stakeholders to limit opportunities for conflict situations. Mogalakwena Complex's contractor management plan also needs to be implemented to ensure that appointed contractors also employ locally as far as practically possible Support for local businesses through SMME development should be prioritised, with support from other surrounding mines, business forums and the municipality. The appointment of local business and the use of their products and services should be promoted as far as practically possible, as it will potentially open opportunities for local employment Continued participation of labour unions in Work Place Skills Plans and Annual Training Reports should be encouraged, and feedback provided to employees at mass meetings Ensure compliance with Stakeholder Engagement Plan, Socio-Economic Development Plan and Contractor Management Plan 	5	4	2	4	1	50	Moderate	16.7

	Anticipated increases in noise and nuisance effects	Negative	3	4	1	4	2	27	Low	<ul style="list-style-type: none"> Incorporate activities associated with the project into the site Community Health and Safety Management Plan Implement Environmental, Health and Safety Guidelines in line with AASW3 as well Mogalakwena Complex's Noise Impact Management Plan Noise must be monitored on a quarterly basis 	2	4	1	4	1	18	Low	33.3
	Continued social differentiation and inequality	Negative	3	4	2	6	2	36	Moderate	<ul style="list-style-type: none"> Engage with community leadership indicating that the project is an extension of current mining activities Inform communities about the ways AAP is assisting with socio-economic development and their Social and Labour Plan commitments Ensure that transparent communication methods are used throughout the project Ensure compliance with Stakeholder Engagement Plan, Socio-Economic Development Plan and Contractor Management Plan Update commitments register on a regular basis 	2	4	2	4	2	20	Low	44.4

Table 11-10: Operational impacts applicable to all the proposed cable yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR	P			D	E	M	LoR	Significance				
Geology	The operation of the proposed cable yard is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.	No mitigation measures are required as no material impact is anticipated.																
Topography	The operation proposed cable yard is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.	No mitigation measures are required as no material impact is anticipated.																
Soils, land use and land capability	Continued loss of soil resource and its utilisation potential for all areas covered by infrastructure and operational areas	Negative	3	2	2	6	3	30	Moderate	<ul style="list-style-type: none"> Minimise footprint and restrict area of impact to as small an area as practical and manage all stockpiles of stripped soil for erosion and contamination Manage vegetative/rock cladding and impacts of dirty water/dust ingress 	2	2	1	4	2	14	Low	53.3
	Loss of resource due to unprotected overland flow of dirty water (suspended solids and possible hydrocarbons/reagents) and erosion of soils by water and/or wind - potential for offsite contamination/impacts by dust and dirty water.	Negative	2	2	2	6	3	20	Low	<ul style="list-style-type: none"> Manage stockpiles and berms for vegetative cover to restrict erosion, and maintain and manage stormwater control systems to prevent erosion and ingress of dirty water 	1	2	1	4	2	7	Low	65.0
	On-going loss of soil utilisation potential from unprotected stockpiles and in-situ sites due to leaching of nutrient stores (inclusive of organic carbon stores)	Negative	2	2	2	6	3	20	Low	On-going monitoring and maintenance of vegetative cover/rock cladding to all material stockpiles and berms, concurrent rehabilitation of all non-essential or disused areas, and the maintenance of stormwater control systems.	1	2	1	4	2	7	Low	65.0
Floral ecology and indigenous vegetation	Loss of floral diversity and habitat due to construction activities and vegetation clearing; i) Dumping of construction material within areas where no construction is planned; ii) Proliferation of alien invasive species within the footprint area due to pre-construction activities, spreading into the surrounding areas. This could lead to the potential loss of floral species within surrounding habitat areas.	Negative	4	3	3	6	3	48	Moderate	<ul style="list-style-type: none"> If any spills occur, they should be immediately cleaned up to avoid soil contamination that can hinder floral rehabilitation later down the line. Spill kits should be kept on-site within workshops. In the event of a breakdown, maintenance of vehicles must take place with care, and the recollection of spillage should be practised, preventing the ingress of hydrocarbons into the topsoil An AIP control plan must be implemented for areas cleared outside of the authorised footprint area. 	3	2	2	4	1	24	Low	50.0

	Loss of floral diversity and habitat due to potentially poorly managed edge effects such as i) Ineffective rehabilitation of compacted areas, bare soils, or eroded areas leading to ongoing proliferation of AIP species in disturbed areas and subsequent spread to surrounding natural areas altering the floral habitat; ii) Compaction of soils outside of the study area due to indiscriminate driving of construction vehicles through natural vegetation; and iii) Habitat fragmentation because of construction activities leading to loss of floral diversity.	Negative	4	2	3	8	3	52	Moderate	<ul style="list-style-type: none"> Care should be taken during the mining phase of the proposed development to limit edge effects to surrounding natural habitat. At minimum, this can be achieved by: i) Demarcating all footprint areas during operational activities; ii) All soils compacted because of operational activities should be ripped and profiled and reseeded; iv) Manage the spread of AIP species, which may affect remaining natural habitat within surrounding areas. Any areas that have been left bare because of the operational activities should be rehabilitated using indigenous species. 	3	1	2	2	1	15	Low	71.2
	Loss of floral SCC from the study area for the following reasons: i) Potential failure to monitor relocation success of occurring and potential occurring floral SCC (relocation must have taken place before construction phase); and ii) Harvesting of floral SCC outside of the construction footprint by construction personnel.	Negative	4	4	2	6	2	48	Moderate	<ul style="list-style-type: none"> No collection of indigenous floral species must be allowed by construction personnel, especially with regards to floral SCC (if encountered) Edge effect control needs to be implemented by fencing off or demarcating no-go areas to prevent further degradation and potential loss of floral SCC and their habitat outside of the proposed development footprint area 	3	3	1	4	1	24	Low	50.0
	Loss of floral diversity and habitat due to construction and operational activities: i) Destruction of vegetation due to unplanned fires; ii) Dust generated during construction and operational activities accumulating on the surrounding floral individuals, altering the photosynthetic ability of plants, and potentially further decreasing optimal growing/re-establishing conditions.	Negative	3	3	3	6	2	36	Moderate	<ul style="list-style-type: none"> Where possible suppress dust to mitigate the impact of dust on flora within a close proximity of construction activities 	2	2	2	4	1	16	Low	55.6
Freshwater ecosystem	Due to the distance of the Mohlosane River from the study area, as well as the presence of 'buffers' such as dense vegetation and altered topography resulting from historical mining activities between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented									<ul style="list-style-type: none"> Dust suppression measures must be put into place during operational activities It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998) Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine 								
Noise	Noise generated by the cable yard general activities, compressors, cranes, mobile generators etc resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint.	Negative	3	5	2	6	2	39	Moderate	All noise sources in excess of 85.0dBA to be acoustically screened off	2	5	2	4	1	22	Low	43.6
	Traffic to and from the cable yard resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint.	Negative	3	5	2	6	2	39	Moderate	Access roads to and from the project area to be kept in good order at all times.	2	5	2	4	1	22	Low	43.6

	Noise from the administrative buildings resulting in noise increases in excess of the 70.0 dBA threshold value along the MRA footprint	Negative	2	5	2	6	2	26	Low	All noise sources in excess of 85.0dBA to be acoustically screened off	2	5	2	4	1	22	Low	15.4
Air Quality	Dust generation potentially resulting in nuisance and health effects on nearby receptors due to materials handling, vehicle entrainment of dust on the haul roads and windblown dust from the open and bare areas	Negative	3	4	2	4	1	30	Moderate	<ul style="list-style-type: none"> Use dust suppression techniques such as wet suppression or chemical suppression (must be environmentally friendly and non-polluting) to reduce dust on roads that exhibit an increase of dust emitted from the entrainment of dust Design road alignments to minimise travel distances and eliminate unnecessary traffic Speed limits within the mine should be adhered to for both treated haul roads and unpaved roads Development and implementation of routine emissions and ambient air quality monitoring program to determine whether there are any significant increases in emissions and impacts at sensitive receptors 	2	4	2	2	1	16	Low	46.7
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	The operation of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	The operation of the proposed pre-assembly yard footprint is unlikely to materially affect the surface water resources. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	Increased community and employee exposure to hazards and risks	Negative	3	4	1	6	3	33	Moderate	<ul style="list-style-type: none"> Inform affected community about potential risks and impacts from the project activities in a culturally appropriate manner, including collaborating with the community and government agencies in their efforts to respond effectively to emergency situations Recruit and/or train staff who will be responsible for the implementation of health and safety in line with the Community Health and Safety Management Plan Minimize transmission of communicable diseases (e.g. Covid 19, HIV/Aids) that may be associated with the influx of temporary or permanent project labour by referencing existing Health Impact Assessments and updating the site Community Health and Safety Management Plan and Covid 19 Action Plan Incorporate project activities into the Mogalakwena Complex Emergency Response Plan and Community Health and Safety Management Plan Keep First Aid supplies on site Undertake induction training as well as regular refresher training sessions on health and safety for employees Include the respective contractors (if applicable to the project) in the health and safety training Inform the employees of the emergency response plan in conjunction with the training 	2	4	1	4	2	18	Low	45.5

	Limited employment creation and benefits	Negative	5	4	2	6	1	60	High	<ul style="list-style-type: none"> Emerging employment opportunities should be targeted at local residents as well as people from the surrounding communities in cases where the skills cannot be obtained from immediately adjacent communities Update commitments register on a regular basis Mogalakwena Complex should continue to provide the surrounding communities with practical skills training so that they have the opportunity to upskill themselves and apply for jobs with the mine. Recruitment of labour should be guided by AAP's recruitment policies which should promote the employment of local labour. The recruitment process must be transparent and communicated to stakeholders to limit opportunities for conflict situations. Mogalakwena Complex's contractor management plan also needs to be implemented to ensure that appointed contractors also employ locally as far as practically possible Support for local businesses through SMME development should be prioritised, with support from other surrounding mines, business forums and the municipality. The appointment of local business and the use of their products and services should be promoted as far as practically possible, as it will potentially open opportunities for local employment Continued participation of labour unions in Work Place Skills Plans and Annual Training Reports should be encouraged, and feedback provided to employees at mass meetings Ensure compliance with Stakeholder Engagement Plan, Socio-Economic Development Plan and Contractor Management Plan 	5	4	2	4	1	50	Moderate	16.7
	Anticipated increases in noise and nuisance effects	Negative	3	4	1	4	2	27	Low	<ul style="list-style-type: none"> Incorporate activities associated with the project into the site Community Health and Safety Management Plan Implement Environmental, Health and Safety Guidelines in line with AASW3 as well Mogalakwena Complex's Noise Impact Management Plan Noise must be monitored on a quarterly basis 	2	4	1	4	1	18	Low	33.3
	Continued social differentiation and inequality	Negative	3	4	2	6	2	36	Moderate	<ul style="list-style-type: none"> Engage with community leadership indicating that the project is an extension of current mining activities Inform communities about the ways AAP is assisting with socio-economic development and their Social and Labour Plan commitments Ensure that transparent communication methods are used throughout the project Ensure compliance with Stakeholder Engagement Plan, Socio-Economic Development Plan and Contractor Management Plan Update commitments register on a regular basis 	2	4	2	4	2	20	Low	44.4
Socio-economic	Reduced air quality and increase in dust (site)	Negative	3	2	1	4	1	21	Low	<ul style="list-style-type: none"> Incorporate activities associated with the proposed project into the site Community Health and Safety Management Plan Include participatory monitoring of community health and safety risks and impacts in management plans Maintain current dust management monitoring measures as per the EMPr Ensure dust levels are below the respective standards Raise awareness amongst surrounding communities on the available grievance mechanisms Implement dust suppression methods for vehicles such as dampening the roads Dust must be monitored in line with the current monitoring programme at Mogalakwena Complex (i.e. monthly) Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive receptors, taking account of prevailing wind directions and seasonal variations in the prevailing wind directions 	2	2	1	2	1	10	Low	52.4
	Increase community and employee exposure to hazards and risks	Negative	2	2	2	2	1	12	Low	<ul style="list-style-type: none"> Incorporate project activities into the Mogalakwena Complex emergency response plan Keep First Aid supplies on site Undertake induction training as well as regular refresher training sessions on health and safety for employees Include the respective contractors (if applicable to the project) in the health and safety training Inform the employees of the emergency response plan in conjunction with the training. 	1	2	1	2	1	5	Low	58.3
	Potential temporary increase in job creation	Positive	2	2	2	6	1	20	Low	<ul style="list-style-type: none"> Emerging employment opportunities as part of general construction activities should be targeted at local residents as well as people from the surrounding communities in cases where the skills cannot be obtained from immediately adjacent communities Update commitments register on a regular basis 	3	2	2	6	1	30	Moderate	50.0

11.4.4 Closure and post-closure phase

The tables below list the main project related activities that will be undertaken during the closure, rehabilitation and post closure phase of the proposed project. Refer to Section 26.6 for the closure actions and post closure monitoring.

Phase	Pre-assembly yard	Cable yard
Closure/Rehabilitation	All hardstanding areas will be removed off site and the area will be re-topsoiled if required and revegetated in line with the Complex's existing rehabilitation plan.	General project related infrastructure will be retained on site until Complex closure. The area will be monitored for the presence of alien invasive species as part of the Complex's AIP. Area will be rehabilitated according to the closure and rehabilitation plan. Area will be re-topsoiled if required.
	All infrastructure will be removed off site and the area will be revegetated in line with the Complex's existing rehabilitation plan.	
Post-closure	Monitoring of revegetated areas and removal of alien invasive species.	Monitoring of revegetated areas and removal of alien invasive species.
	Monitoring of groundwater and surface water.	Demolition of project related infrastructure.
	Handling of potential contaminated soils.	Handling of potential contaminated soils.
		Monitoring of groundwater and surface water.

Table 11-11: Closure/rehabilitation and post-closure phase impacts applicable to all the proposed activities associated with the proposed pre-assembly yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Significance	Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)		
		P	D	E	M	LoR				P	D	E	M	LoR	Significance			
Closure/Rehabilitation Phase																		
Geology	The closure and rehabilitation of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.							Moderate	No mitigation measures are required as no material impact is anticipated.									
Topography	The closure and rehabilitation of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.							Moderate	No mitigation measures are required as no material impact is anticipated.									
Soils, land use and land capability	Loss of soil nutrient and organic carbon stores while in storage and during replacement/rehabilitation process.	Negative	4	5	1	6	4	48	Moderate	<ul style="list-style-type: none"> Replace nutrient and organic carbon matter at time of rehabilitation. Undertake landscaping of the topographic slope (to ensure that it is free draining), cultivate soils and replace of vegetative cover as soon as subsoil and topsoils have been replaced. Monitoring of vegetative growth until self-sustaining Closure and rehabilitation to be aligned to closure and rehabilitation plan 	3	4	1	4	3	27	Low	43.8
	Contamination of in-situ and stored materials by dirty water outwash and use of dirty water for irrigation during rehabilitation of sites.	Negative	4	5	1	6	4	48	Moderate	<ul style="list-style-type: none"> Management of stormwater control systems and monitoring of water quality used for irrigation of vegetated areas. 	3	4	1	4	3	27	Low	43.8
	Hydrocarbon/reagent spillage from rehabilitation equipment during reinstatement of soils and vegetative cover, plus potential for compaction of replaced materials, erosion from water and wind of unprotected surfaces and impact on off-site streams and rivers/dams.	Negative	4	5	2	4	3	44	Moderate	<ul style="list-style-type: none"> Maintenance and management of all vehicles and restriction on access of vehicles and grazing animals to rehabilitated areas and/or unprotected soils. Installation of erosion control measures along all drainage ways/channels and on any/all sensitive sites 	3	4	2	2	2	24	Low	45.5
Floral ecology and indigenous vegetation	Ineffective implementation of rehabilitation activities: Permanent loss of floral habitat, floral diversity, and floral SCC due to loss of favourable habitat to reinstate floral SCC. Higher likelihood of edge effect impacts on adjacent and nearby natural vegetation of increased sensitivity.	Negative	3	3	2	6	2	33	Moderate	<ul style="list-style-type: none"> All infrastructure footprints that will be decommissioned should be rehabilitated in accordance with a rehabilitation plan compiled by a suitable specialist Regular dust suppression must be undertaken on bare soils during the closure and decommissioning phase. Storm water management measures should be maintained until rehabilitation is complete All disturbed areas should be ripped to alleviate compaction All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated Rehabilitation efforts must be implemented for a period of at least five years after decommissioning or until it is evident that veg has taken and can maintain self-sustained populations. A mix of indigenous grass seeds can be used during rehabilitation activities to re-establish a protective cover, to minimise soil erosion and dust emissions Contractors will not be allowed to harvest any natural resources 	2	2	1	4	1	14	Low	57.6

	Potentially poorly implemented and monitored AIP Management programme, leading to the reintroduction and proliferation of AIP species within the area. Potential failure to monitor rehabilitation as per the BAP set out for the mine.	Negative	4	3	2	8	3	52	Moderate	<ul style="list-style-type: none"> AIP control plans should be implemented to ensure continued control of AIP species within the study area and surrounding areas Follow up with alien and invasive plant control measures for a period of 5 years post-closure No dumping of litter must be allowed on-site. As such it is advised that vegetation cuttings be carefully collected and disposed of at a separate waste facility Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC or suitable habitat for such species outside of the proposed development footprint 	3	2	1	6	1	27	Low	48.1
	Potential poor monitoring of relocated SCC resulting in the loss of SCC from the study area and poorly reinstated and represented floral SCC within rehabilitated areas.	Negative	4	3	2	6	2	44	Moderate	<ul style="list-style-type: none"> Monitoring of rescued and relocated floral SCC, particularly the NFA protected species recorded within the study area, should continue during the operational and maintenance phase until it is evident that the species have successfully established As far as possible, no collection of floral SCC or medicinal floral species within the study area or adjacent natural habitat must be allowed during the any of the proposed phases of the development established 	3	2	1	4	1	21	Low	52.3
Freshwater ecosystem	Due to the distance of the Groot Sandsloot (Pholotsi) River from the study area, as well as the presence of informal 'buffers' including a 10 m gravel road and dense vegetation between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.									<ul style="list-style-type: none"> Dust suppression measures must be put into place during site closure and rehabilitation "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine 								
Noise	Noise generated due to activities associated with rehabilitation of disturbed areas	Negative	2	2	2	4	2	16	Low	<ul style="list-style-type: none"> Demolition activities to be done during daytime working hours with demolition machinery/equipment which complies with the manufacturers specifications on all times 	1	2	2	4	1	8	Low	50.0
	Noise increase along the mining right boundaries during the planting of grass/vegetation at the disturbed areas.	Negative	2	3	3	4	3	20	Low	<ul style="list-style-type: none"> Planting of grass/vegetation activities to be done during daytime working hours with machinery which complies with the manufacturers specifications on all times 	1	2	2	4	1	8	Low	60.0
Air Quality	Dust generation potentially resulting in nuisance and health effects on nearby receptors due to materials handling, vehicle entrainment of dust on the haul roads and windblown dust from the open and bare areas	Negative	3	2	2	4	1	24	Low	<ul style="list-style-type: none"> Demolish all infrastructure and rehabilitate on the footprint exposed by demolition activities Revegetate all open and bare areas to reduce windblown dust Effective and expedient rehabilitation of dust and other emissions sources Continuation of the ambient air quality monitoring program. 	2	2	2	2	1	12	Low	50.0
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	The closure and rehabilitation of the proposed pre-assembly yard footprint is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	The closure and rehabilitation of the proposed pre-assembly yard footprint is unlikely to materially affect the surface water resources. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	Decreased community and employee exposure to hazards and risks	Positive	3	4	3	6	2	39	Moderate	<ul style="list-style-type: none"> Rehabilitation specialist to implement the requirements of the Closure and Rehabilitation Plan Consider surrounding land uses and design post-mining land use options to support and enhance long-term development options for the community Proactively engage stakeholders on social mine closure criteria Ensure compliance with Anglo American Mine Closure Standard and Mine Closure Toolkit 	4	5	3	8	1	64	High	64.1
Post-Closure Phase																		
Geology	The post-closure phase of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Topography	The post closure phase of the proposed pre-assembly yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Soils, land use and land capability	Addition of fertiliser and compost to rehabilitated sites have potential to contaminate the vadose zone and associated soil water if not well managed.	Negative	5	5	3	6	5	70	High	<ul style="list-style-type: none"> Assessment of soil physical and chemical requirements, water holding capabilities, hydrogeological considerations and calculation of fertiliser inputs as part of the soil utilisation plan and rehabilitation implementation programme Ongoing monitoring of water quality, erosion and compaction concerns and the overall growth of the re-vegetation effort 	4	4	2	6	5	48	Moderate	31.4

	Uncontrolled access to rehabilitated sites by animals, vehicles, people will result in compaction and erosion of unprotected/non vegetative sites (over grazing etc.).	Negative	5	5	2	4	3	55	Moderate	Control of access to rehabilitated sites until well established and sustainable.	4	4	2	6	3	48	Moderate	12.7
Floral ecology and indigenous vegetation	All infrastructures will have been removed; therefore the floral ecology and indigenous vegetation should not be further impacted by any of the post-closure activities									No mitigation measures are required as no material impact is anticipated.								
Freshwater ecosystem	All infrastructures will have been removed; therefore the freshwater ecosystem should not be further impacted by any of the post-closure activities									No mitigation measures are required as no material impact is anticipated.								
Noise	Maintenance of disturbed areas	Negative	2	2	2	4	2	16	Low	Maintenance activities to be done during daytime working hours with machinery which complies with the manufacturers specifications on all times.	1	2	2	4	1	8	Low	50.0
Air Quality	With rehabilitation plans expected to be implemented in the closure phase, it is envisaged that the impact will be positive and that the rehabilitation measures will improve the air quality within the study area	Positive	5	5	2	6	1	65	High	<ul style="list-style-type: none"> Effective implementation of the closure plan Continuation of monitoring and maintenance procedures to ensure rehabilitation measures have been implemented adequately 	5	5	2	8	1	75	High	15.4
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								

Table 11-12: Closure/rehabilitation and post-closure phase impacts applicable to all the proposed activities associated with the proposed cable yard area

Aspect	Nature of the impact	Significance of potential impact BEFORE mitigation						Mitigation Measures	Significance of potential impact AFTER mitigation						Degree of mitigation (%)			
		P	D	E	M	LoR	Significance		P	D	E	M	LoR	Significance				
Closure/Rehabilitation Phase																		
Geology	The closure and rehabilitation of the proposed cable yard is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.							No mitigation measures are required as no material impact is anticipated.										
Topography	The closure and rehabilitation of the proposed cable yard is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.							No mitigation measures are required as no material impact is anticipated.										
Soils, land use and land capability	Loss of soil nutrient and organic carbon stores while in storage and during replacement/rehabilitation process.	Negative	4	5	1	6	4	48	Moderate	<ul style="list-style-type: none"> Replace nutrient and organic carbon matter at time of rehabilitation. Undertake landscaping of the topographic slope (to ensure that it is free draining), cultivate soils and replace of vegetative cover as soon as subsoil and topsoils have been replaced. Monitoring of vegetative growth until self-sustaining Closure and rehabilitation to be aligned to closure and rehabilitation plan 	3	4	1	4	3	27	Low	43.8
	Contamination of in-situ and stored materials by dirty water outwash and use of dirty water for irrigation during rehabilitation of sites.	Negative	4	5	1	6	4	48	Moderate	Management of stormwater control systems and monitoring of water quality used for irrigation of vegetated areas.	3	4	1	4	3	27	Low	43.8
	Hydrocarbon/reagent spillage from rehabilitation equipment during reinstatement of soils and vegetative cover, plus potential for compaction of replaced materials, erosion from water and wind of unprotected surfaces and impact on off-site streams and rivers/dams.	Negative	4	5	2	4	3	44	Moderate	<ul style="list-style-type: none"> Maintenance and management of all vehicles and restriction on access of vehicles and grazing animals to rehabilitated areas and/or unprotected soils. Installation of erosion control measures along all drainage ways/channels and on any/all sensitive sites 	3	4	2	2	2	24	Low	45.5

Floral ecology and indigenous vegetation	Ineffective implementation of rehabilitation activities: Permanent loss of floral habitat, floral diversity, and floral SCC due to loss of favourable habitat to reinstate floral SCC. Higher likelihood of edge effect impacts on adjacent and nearby natural vegetation of increased sensitivity.	Negative	3	3	2	6	2	33	Moderate	<ul style="list-style-type: none"> All infrastructure footprints that will be decommissioned should be rehabilitated in accordance with a rehabilitation plan compiled by a suitable specialist Regular dust suppression must be undertaken on bare soils during the closure and decommissioning phase. Storm water management measures should be maintained until rehabilitation is complete All disturbed areas should be ripped to alleviate compaction All rehabilitated areas should be rehabilitated to a point where natural processes will allow the ecological functioning and biodiversity of the area to be re-instated Rehabilitation efforts must be implemented for a period of at least five years after decommissioning or until it is evident that veg has taken and can maintain self-sustained populations. A mix of indigenous grass seeds can be used during rehabilitation activities to re-establish a protective cover, to minimise soil erosion and dust emissions Contractors will not be allowed to harvest any natural resources 	2	2	1	4	1	14	Low	57.6
	Potentially poorly implemented and monitored AIP Management programme, leading to the reintroduction and proliferation of AIP species within the area. Potential failure to monitor rehabilitation as per the BAP set out for the mine.	Negative	4	3	2	8	3	52	Moderate	<ul style="list-style-type: none"> AIP control plans should be implemented to ensure continued control of AIP species within the study area and surrounding areas Follow up with alien and invasive plant control measures for a period of 5 years post-closure No dumping of litter must be allowed on-site. As such it is advised that vegetation cuttings be carefully collected and disposed of at a separate waste facility Edge effect control needs to be implemented to prevent further degradation and potential loss of floral SCC or suitable habitat for such species outside of the proposed development footprint 	3	2	1	6	1	27	Low	48.1
	Potential poor monitoring of relocated SCC resulting in the loss of SCC from the study area and poorly reinstated and represented floral SCC within rehabilitated areas.	Negative	4	3	2	6	2	44	Moderate	<ul style="list-style-type: none"> Monitoring of rescued and relocated floral SCC, particularly the NFA protected species recorded within the study area, should continue during the operational and maintenance phase until it is evident that the species have successfully established As far as possible, no collection of floral SCC or medicinal floral species within the study area or adjacent natural habitat must be allowed during the any of the proposed phases of the development established 	3	2	1	4	1	21	Low	52.3
Freshwater ecosystem	Due to the distance of the Mohlosane River from the study area, as well as the presence of informal 'buffers' including a 10 m gravel road and dense vegetation between the study area and the river which will intercept any potential indirect impacts such as runoff from the study area, no significant quantum of risk is anticipated. Nevertheless, it is critical that well-developed, site-specific, 'good practice' mitigation measures be implemented throughout the life of the proposed project to ensure that indirect impacts are prevented.								<ul style="list-style-type: none"> Dust suppression measures must be put into place during site closure and rehabilitation "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine 									
Noise	Noise generated due to activities associated with rehabilitation of disturbed areas	Negative	2	2	2	4	2	16	Low	<ul style="list-style-type: none"> Demolition activities to be done during daytime working hours with demolition machinery/equipment which complies with the manufacturers specifications on all times 	1	2	2	4	1	8	Low	50.0
	Noise increase along the mining right boundaries during the planting of grass/vegetation at the disturbed areas.	Negative	2	3	3	4	3	20	Low	<ul style="list-style-type: none"> Planting of grass/vegetation activities to be done during daytime working hours with machinery which complies with the manufacturers specifications on all times 	1	2	2	4	1	8	Low	60.0

Air Quality	Dust generation potentially resulting in nuisance and health effects on nearby receptors due to materials handling, vehicle entrainment of dust on the haul roads and windblown dust from the open and bare areas	Negative	3	2	2	4	1	24	Low	<ul style="list-style-type: none"> Demolish all infrastructure and rehabilitate on the footprint exposed by demolition activities Revegetate all open and bare areas to reduce windblown dust Effective and expedient rehabilitation of dust and other emissions sources Continuation of the ambient air quality monitoring program. 	2	2	2	2	1	12	Low	50.0
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	The closure and rehabilitation of the proposed cable yard is unlikely to materially affect the groundwater. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	The closure and rehabilitation of the proposed cable yard footprint is unlikely to materially affect the surface water resources. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	Decreased community and employee exposure to hazards and risks	Positive	3	4	3	6	2	39	Moderate	<ul style="list-style-type: none"> Rehabilitation specialist to implement the requirements of the Closure and Rehabilitation Plan Consider surrounding land uses and design post-mining land use options to support and enhance long-term development options for the community Proactively engage stakeholders on social mine closure criteria Ensure compliance with Anglo American Mine Closure Standard and Mine Closure Toolkit 	4	5	3	8	1	64	High	64.1
Post-Closure Phase																		
Geology	The post-closure phase of the proposed cable yard footprint is unlikely to materially affect or be affected by the local geology. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Topography	The post closure phase of the proposed cable yard footprint is unlikely to materially affect or be affected by the local topography. No material impact is anticipated.									No mitigation measures are required as no material impact is anticipated.								
Soils, land use and land capability	Addition of fertiliser and compost to rehabilitated sites have potential to contaminate the vadose zone and associated soil water if not well managed.	Negative	5	5	3	6	5	70	High	<ul style="list-style-type: none"> Assessment of soil physical and chemical requirements, water holding capabilities, hydrogeological considerations and calculation of fertiliser inputs as part of the soil utilisation plan and rehabilitation implementation programme Ongoing monitoring of water quality, erosion and compaction concerns and the overall growth of the re-vegetation effort 	4	4	2	6	5	48	Moderate	31.4
	Uncontrolled access to rehabilitated sites by animals, vehicles, people will result in compaction and erosion of unprotected/non vegetative sites (over grazing etc.).	Negative	5	5	2	4	3	55	Moderate	Control of access to rehabilitated sites until well established and sustainable.	4	4	2	6	3	48	Moderate	12.7
Floral ecology and indigenous vegetation	All infrastructures will have been removed; therefore the floral ecology and indigenous vegetation should not be further impacted by any of the post-closure activities									No mitigation measures are required as no material impact is anticipated.								
Freshwater ecosystem	All infrastructures will have been removed; therefore the freshwater ecosystem should not be further impacted by any of the post-closure activities									No mitigation measures are required as no material impact is anticipated.								
Noise	Maintenance of disturbed areas	Negative	2	2	2	4	2	16	Low	Maintenance activities to be done during daytime working hours with machinery which complies with the manufacturers specifications on all times.	1	2	2	4	1	8	Low	50.0
Air Quality	With rehabilitation plans expected to be implemented in the closure phase, it is envisaged that the impact will be positive and that the rehabilitation measures will improve the air quality within the study area	Positive	5	5	2	6	1	65	High	<ul style="list-style-type: none"> Effective implementation of the closure plan Continuation of monitoring and maintenance procedures to ensure rehabilitation measures have been implemented adequately 	5	5	2	8	1	75	High	15.4
Cultural heritage	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Palaeontology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Geohydrology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Surface water hydrology	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								
Socio-economic	No further impacts expected									No mitigation measures are required as no material impact is anticipated.								

11.4.5 Soil utilisation plan

A summary of the soil utilisation/conservation plan for the construction, operation, decommissioning and closure phases of the proposed project is provided in Table 11-137.

Table 11-13: Summary of the soil utilisation/conservation plan for the construction, operation, decommissioning and closure phases

Construction phase		
Step	Factors to consider	Comments
Delineation of areas to be stripped		Stripping will only occur where soils are to be disturbed by activities that are described in the design report, and where a clearly defined end rehabilitation use for the stripped soil has been identified.
Reference to biodiversity action plan		It is recommended that grasses and shrubs that can be recovered be stripped and stored as part of the utilisable soil. However, the requirements for moving and preserving fauna and flora according to the biodiversity action plan should be consulted.
Stripping and handling of soils	Handling	Soils will be handled in dry weather conditions so as to cause as little compaction as possible. Utilisable soil (Topsoil and upper portion of subsoil B2/1) must be removed and stockpiled separately from the lower "B" horizon, with the calcrete and/or any ferricrete layer being separated from the soft/decomposed rock, and wet based soils separated from the dry soils if they are to be impacted.
	Stripping	The "Utilisable" soil will be stripped to a depth of 750mm or until hard rock/calcrete and/or ferricrete is encountered. These soils will be stockpiled together with any vegetation cover present (only large vegetation to be removed prior to stripping). The total stripped depth should be 750mm, wherever possible.
Delineation of stockpiling areas	Location	Stockpiling areas will be identified in close proximity to the source of the soil to limit handling and to promote reuse of soils in the correct areas.
	Designation of Areas	Soils stockpiles will be demarcated, and clearly marked to identify both the soil type and the intended area of rehabilitation.
Operations		
Step	Factors to consider	Comments
Stockpile management	Vegetation establishment and erosion control	Rapid growth of vegetation on the Soil Stockpiles will be promoted (e.g. by means of watering or fertilisation). The purpose of this exercise will be to protect the soils and combat erosion by water and wind.
	Storm water control	Stockpiles will be established with storm water diversion berms to prevent run off erosion.
	Stockpile height and stability	Soil stockpile heights will be restricted where possible to <1.5m so as to avoid compaction and damage to the soil seed pool. Where stockpiles higher than 1.5m cannot be avoided, these will be benched to a maximum height of 15m. Each bench should ideally be 1.5m high and 2m wide. For storage periods greater than 3 years, vegetative cover is essential, and should be encouraged using fertilization and induced seeding with water. The stockpile side slopes should be stabilized at a slope of 1 in 6. This will promote vegetation growth and reduce run-off related erosion.
	Waste	No waste material will be placed on the soil stockpiles.
	Vehicles	Equipment movement on top of the soil stockpiles will be limited to avoid topsoil compaction and subsequent damage to the soils and seedbank.

Decommissioning and Closure		
Step	Factors to consider	Comments
Rehabilitation of disturbed land and restoration of soil utilisation	Placement of soils	Stockpiled soil will be used to rehabilitate disturbed sites either ongoing as disturbed areas become available for rehabilitation and/or at closure. The utilizable soil (500mm) removed during the construction phase or while opening up of open cast workings, shall be redistributed in a manner that achieves an approximate uniform stable thickness consistent with the approved postmining land use (Low intensity grazing), and will attain a free draining surface profile. A minimum layer of 300mm of soil will be replaced.
	Fertilisation	A representative sampling of the stripped soils will be analysed to determine the nutrient status of the utilizable materials. As a minimum the following elements will be tested for: EC, CEC, pH, Ca, Mg, K, Na, P, Zn, Clay% and Organic Carbon. These elements provide the basis for determining the fertility of soil. based on the analysis, fertilisers will be applied if necessary.
	Erosion control	Erosion control measures will be implemented to ensure that the soil is not washed away and that erosion gulleys do not develop prior to vegetation establishment.
Pollution of soils	In-situ Remediation	If soil (whether stockpiled or in its undisturbed natural state) is polluted, the first management priority is to treat the pollution by means of in situ bioremediation. The acceptability of this option must be verified by an appropriate soils expert and by DWS, on a case by case basis, before it is implemented.
	Off-site disposal of soils	If in situ treatment is not possible or acceptable then the polluted soil must be classified according to the National Environmental Waste Management Act: Waste Management and Classification Regulations and managed accordingly.

11.5 Cumulative impacts

The localised cumulative impacts are those where the magnitude of the combined impacts is greater than the sum of the individual effects.

Cumulative effects or aspects thereof are generally uncertain and therefore difficult to quantify, due to limited data availability and accuracy, and uncertainty about the status, description, technical details and management measures in place or planned for neighbouring projects in the area. Due to the scale of the proposed project and its locality within an existing disturbed operational area it is anticipated that the additional impacts generated from these projects will be minimal and will therefore not add significantly to the overall cumulative impact of Mogalakwena Complex on the surrounding area.

From a social perspective communities positioned around the Mogalakwena Complex already experience impacts as a result of mining activities. The pre-assembly yard and cable yard may lead to an insignificant increase in existing noise and dust levels. None the less, these impacts will be cumulative to what is already experienced by local communities.

Based on the specialist studies undertaken for the proposed pre-assembly and cable yard projects, the following is of reference pertaining to cumulative impacts:

- **Noise:** The noise specialist has recommended that Environmental noise audit to be carried out once the pre-assembly and cable yard projects are commissioned.
- **Freshwater ecology:** The proposed projects are not expected to impact negatively on the river systems located in their proximity, nor are they likely to contribute significantly to cumulative impacts on the system, provided that appropriate mitigation measures are implemented throughout the life of the proposed projects. Continued rehabilitation efforts such as long-term alien vegetation management and reinstatement of indigenous vegetation around the study area will assist in ensuring that any potential runoff is minimised and these rehabilitation measures will contribute towards maintaining the ecological functioning of the freshwater systems. It is also essential that the mine adheres to existing management measures associated

with activities unrelated to the proposed projects, such as ensuring that clean and dirty water management systems are maintained and expanded if necessary, ensuring that all pollution containment facilities can accommodate a minimum 1:50 year flood event and are appropriately aligned, and where possible, accommodate new infrastructure in already disturbed areas to minimise the footprint of disturbance. It is also recommended that provision for rehabilitation of affected reaches of the rivers and where necessary, its tributaries, be made.

- **Floral ecology and indigenous vegetation:** The greatest threat to the floral ecology within the study area and the local region is the ongoing proliferation of poorly managed AIP species and woody encroachment (as a result of overgrazing practices) which can result in an overall cumulative loss of native floral communities within the area.

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

The proposed pre-assembly yard and cable yard projects will occur within the Mogalakwena Complex area, which has largely already been affected by current mining activities. Previous specialist studies assessed potential environmental and social impacts which identified appropriate mitigation and management measures to avoid and /or minimise the identified impacts associated with the project areas.

The mitigation hierarchy was applied throughout the BA Process. The mitigation hierarchy is an approach to mitigation planning and can be summarised into the following steps:

- Avoidance;
- Minimisation;
- Restoration and
- Offsets.

In the Impact Assessment Phase, the findings and recommendations of the previous specialist studies and specialist studies specifically undertaken for this project were used to develop the environmental and operational controls which are focused on impact minimisation and restoration (as part of mine rehabilitation and closure). The mitigation measures are fully described in Part B of this report.

With the mitigation measures applied, the residual risk significance for the assessed impacts and risks is generally low or medium

13 Motivation where no alternative sites were considered

No site alternatives were considered for the pre-assembly yard area as the area required for the proposed pre-assembly yard is 18ha and therefore quite sizable. Mogalakwena Complex currently does not have the required space at any other locations within the complex which are also located in close proximity to the proposed M3C (for which the area is required to pre-assemble M3C components). As a result of this, the preferred area was the only area considered for the pre-assembly yard.

14 Statement motivating the alternative development location within the overall site

In terms of the cable yard area, two alternative locations were considered as follows:

Area 1

Located adjacent to the Nitro Plus facility situated on the north western corner of the Farm Zwartfontein 818 LR. This area has already been demarcated for a planned Very Low-Grade Ore Dump (VLGOD) in accordance with the mine plan. Therefore this will not be a suitable location for the proposed cable yard

Area 2

Located at WRD W02 to the west of North Pit on the Farm Overysel 815 LR next to the magazines explosive area. The workshop will fall under the definition of a “public building” as contemplated in Chapter 1 of the Explosives Regulations (Act 85 of 1993) - “public building” shall mean a church, university, workshop, sports ground stand and erections of a like-nature where persons are accustomed to assemble. No buildings may therefore be constructed in the danger zones and therefore the cable yard cannot be located in this area.

The preferred alternative (to the north of Zwartfontein pit - Figure 5-1) was therefore selected.

15 Assessment of each identified potentially significant impact and risk

It is not anticipated that the proposed projects will result in any significant increase in impact and/or risk as the developments are planned in areas on the mine which are already disturbed if all of the recommended management measures are applied (refer to management measures for each project phase in Section 11.4).

16 Summary of specialist reports

The EAP has worked closely with specialists to determine the baseline conditions which will assist in identifying risks and impacts as part of the proposed pre-assembly yard and cable yard projects. Having worked on other environmental authorisation processes at Mogalakwena Complex the EAP and the specialists have extensive knowledge of the site.

As part of the 2019 EMPr a full suite of specialist studies were conducted which covered large portions of the Complex and these studies have largely been used to inform the baseline of this Basic Assessment. In addition to these, specific specialist studies were undertaken with a specific focus on the pre-assembly and cable yard areas based on the key impacts which the EAP identified (Table 2-6).

Table 16-1: Specialist studies undertaken for the proposed cable yard and pre-assembly yard areas

Specialist Study	Conducted by
Noise	dBAcoustics Mr Barend van der Merwe
Freshwater Ecosystem Assessment	Scientific Aquatic Services Ms Kim Marais
Floral Ecology	Scientific Terrestrial Services Ms Christien Steyn
Heritage	PGS Heritage Mr Polke Birkholtz

Palaeontology desktop review	Banzai Environmental Ms Elize Butler
Rehabilitation and Closure	SRK Consulting Mr James Lake

The specialist studies have been included in Appendix E

16.1 Specialist recommendations

Several specialist studies were undertaken to inform the impact assessment and develop the associated management measures which has been included in Section 18. Specialist recommendations which specifically informed the final site layouts or designs are listed in Table 16-2.

Table 16-2: Summary of specialist recommendation which informed the final site layout or design of the proposed infrastructure

List of studies undertaken	Recommendations of specialists' reports	Specialists recommendations that have been included in the BAR report (mark with an X where applicable)	Reference to applicable section of the report where the specialist recommendations have been included
Pre-assembly yard and cable yard areas			
Floral Ecology	<ul style="list-style-type: none"> If the construction of the proposed pre-assembly laydown area is authorised, a summer season walkdown of the footprint area is recommended in which all species of conservation concern (SCC) are recorded and marked for permit application purposes (be it for rescue and relocation initiatives, or destruction of the specimens). An Alien Invasive Plan (AIP) species management plan and bush encroachment control plan must be developed to manage the proliferation of AIPs with this footprint. 	X	Recommendations have been included as part of the management measures for the impacts identified by each specialist. These management measures will form part of the conditions of the environmental authorisation if the project is authorised. Refer to Section 11. for the management measures for each of the project phases.
Freshwater Ecosystem assessment	<ul style="list-style-type: none"> Vegetation clearing to be limited to the proposed project footprint areas including those associated with any proposed stormwater infrastructure, and vegetation outside of the study area, particularly to the south, must remain intact to retain a natural buffer zone. Topsoil stripped within the study area must be stockpiled for rehabilitation, and stockpiles must be located in the northern portion of the study area. Topsoil stockpile slope monitoring should be carried out regularly to manage the slope angle and height. The slope of the stockpile areas should not be excessively steep in order to minimise erosion risk. Dust suppression measures must be put into place during site clearing and vegetation removal activities. It must be ensured that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998). 	X	

	<ul style="list-style-type: none"> Any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow. "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine. Provision for rehabilitation of affected reaches of the Groot-Sandsloot River and where necessary, its tributaries, be made. 		
Heritage	<ul style="list-style-type: none"> An archaeological watching brief must be implemented during the entire initial period when the surface of the site is cleared of vegetation, graded and levelled; During the watching brief, which will be undertaken during the early stages of the construction, the archaeologist must be allowed to provide guidance and instructions to the construction team as to the depth and extent at which grading activities are undertaken. This is to ensure that the initial disturbance from the graders and machinery do not impact at such a depth to destroy any evidence for graves. An archaeological watching brief report must be compiled and submitted to SAHRA after the end of the watching brief. 		
Paleontology	<ul style="list-style-type: none"> Phase 1 Field-Based Paleontological Assessment report be conducted to assess the value and prominence of fossils in the development area and the effect of the proposed development on the paleontological heritage. 	X	
Noise	<ul style="list-style-type: none"> Equipment and/or machinery which will be used must comply with the manufacturer's specifications on acceptable noise levels and any noise sources above 85.0dBA to be acoustically screened off. Construction activities to take place during day/night time provided that the prevailing ambient noise level along the mine boundaries will not be exceeded. Equipment and/or machinery which radiate noise levels between 85.0dBA and 90.0dBA to be acoustically screened off. Noise monitoring to be carried out along the mining boundaries in the vicinity of the mining expansion footprint areas to identify noise sources on a pro-active basis. Noise monitoring at the communities and the mine boundaries to be done on a quarterly basis for a year after which the frequency can change to an annual basis. Actively manage the process and the noise management plan must be used to ensure compliance to the noise regulations and/or standards. 	X	
Specific heritage recommendations for the pre-assembly yard area			
Heritage	<ul style="list-style-type: none"> Develop a 100m wide buffer area around the identified heritage site (MPAY-01 in Figure 10-28) or mitigate the risk for the presence of unmarked graves by: <ul style="list-style-type: none"> Undertaking a social consultation process to assess whether any local residents or the wider public is aware of the presence of graves at these sites. If the consultation process confirms that graves are located in this area then the following mitigation measures would be required: 	X	Recommendations have been included as part of the management measures for the impacts identified by each specialist. These management measures will

	<ul style="list-style-type: none"> ▪ A grave relocation process must be undertaken. ▪ A detailed social consultation process, at least 60 days in length, comprising the attempted ▪ identification of the next-of-kin in order to obtain their consent for the relocation. ▪ Bilingual site and newspaper notices indicating the intent of the relocation. ▪ Permits from all the relevant and legally required authorities. ▪ An exhumation process that keeps the dignity of the remains and family intact. ▪ An exhumation process that safeguards the legal rights of the families as well as that of the mining company. ▪ The process must be done by a reputable company well versed in the mitigation of graves. <ul style="list-style-type: none"> • All structures and site layouts from each site must be recorded using standard survey methods. The end result would be site layout plans for all these sites. • A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report. • The completed mitigation report must be submitted to the relevant heritage authorities. 		<p>form part of the conditions of the environmental authorisation if the project is authorised. Refer to Section 11.4 for the management measures for each of the project phases.</p>
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17 Environmental impact statement

This section provides an overview of the impact assessment methodology, and recommendations. It also includes the findings of the impact assessment phase which includes both positive and negative impacts identified for the various phases of the project (pre-construction, construction, operation and decommissioning and closure).

17.1 Summary of the key findings of the environmental impact assessment

This BAR and the EMPr serve to identify the potential impacts associated with the pre-assembly yard and cable yard projects. In accordance with the relevant environmental legislation, reasonable measures to mitigate the potential impacts arising from the proposed activities have been assessed and the significance of each of these impacts under both the pre- and post-mitigation scenarios identified and detailed.

The methodology utilised to undertake the impact assessment has incorporated, amongst other skills, professional experience, relevant literature and local knowledge of the site and surrounding area.

It is the EAP's opinion that based on the process that has been followed and the findings of the impact assessment, in conjunction with the proposed mitigation measures, that no unmanageable adverse impacts are expected to occur.

17.2 Final site map

A map which superimposes the proposed pre-assembly and cable yard footprint areas against the environmental sensitivities of the proposed locations of the infrastructure is provided in Appendix F.

17.3 Summary of the positive and negative impacts and risks of the proposed activity and identified alternatives

Refer to Section 11.4 for positive and negative impacts identified for the proposed project.

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

Impact management objectives are provided in Table 18-1. The impacts associated with the proposed project and the identified management measures are provided in Section 11.4. The significance rating of each impact has been re-evaluated post-implementation of management commitments to provide an indication of the effectiveness of the management measures. Through the implementation of the management measures, Mogalakwena Complex will aim to achieve the management objectives associated with the proposed protection measures to be implemented for the pre-assembly yard and cable yard projects.

Table 18-1: Impact management objectives

Aspect	Objective
Social	<ul style="list-style-type: none"> To maximise opportunities for local residents where possible during construction and operation of the proposed projects To facilitate employment of local labour on the mine To avoid creating unrealistic expectations To address ongoing legacy issues and to actively work on restoring trust between the mine and the surrounding communities
Surface and Ground Water	<ul style="list-style-type: none"> Monitor surface water and groundwater quality during the life of the mine and post closure in line with the current monitoring programmes in place at Mogalakwena Complex
Air Quality	<ul style="list-style-type: none"> To restore the PM₁₀ monitoring capabilities at the mine such that PM₁₀ levels can be monitored to ensure that the levels at the key receptor sites are within guideline levels. Continue to implement the dust monitoring programme.
Cultural Heritage	<ul style="list-style-type: none"> To ensure that heritage resources are not damaged by any activities associated by the project as well as the mining activities as a whole, unless the relevant processes in line with the National Heritage Resources Act has been followed.
Paleontology	<ul style="list-style-type: none"> To decrease the effect of the development on potential fossils at the proposed project sites.
Floral ecology	<p>To demonstrate active stewardship of land and biodiversity by:</p> <ul style="list-style-type: none"> Identifying and removing relevant species if necessary; Protected species which may be affected due to the activities must be relocated, where possible; Implementing the Alien Invasive Plan (AIP) to control AIP during all phases of the project and mining as a whole
Freshwater ecosystem	<ul style="list-style-type: none"> To limit vegetation clearing to the proposed project footprint areas including those associated with any proposed stormwater infrastructure, and vegetation outside of the study area, particularly to the south, must remain intact to retain a natural buffer zone. To ensure topsoil stripped within the study area is stockpiled for rehabilitation, and stockpiles must be located in the northern portion of the

Aspect	Objective
	<p>study area. Topsoil stockpile slope monitoring should be carried out regularly to manage the slope angle and height. The slope of the stockpile areas should not be excessively steep in order to minimise erosion risk.</p> <ul style="list-style-type: none"> • To continue to implement dust suppression measures during site clearing and vegetation removal activities. • To ensure that where berms and/or cut off trenches (if any) are developed around the study area they are sufficient in design and size to capture any sediment and water runoff and stop such spreading into the surrounding soil in line with the requirements of GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998). • To ensure that any stormwater outlets for the release of 'clean' water (if planned) should be constructed from energy dissipating structures (such as Armorflex or reno mattresses) to reduce the velocity of water outflow. • To ensure that "Dirty water" (as defined by GN704 of 1999 as it relates to the National Water Act, 1998 (Act 36 of 1998)) emanating from the study area should be captured and re-used as process water of the mine. • To provide for rehabilitation of affected reaches of the Groot-Sandsloot River and where necessary, its tributaries, be made.
Soils and Land Capability	<ul style="list-style-type: none"> • To manage soil contamination by implementing the current standards/procedures in place at Mogalakwena Complex which include: <ul style="list-style-type: none"> ○ Inspection and maintenance plans for mine vehicles and equipment ○ A leak/spill procedure ○ Emergency Preparedness Response ○ Hazardous Waste Management
Noise	<ul style="list-style-type: none"> • To minimise adverse noise impacts from construction and operation • To respond with corrective action to public complaints about noise

19 Aspects for inclusion as conditions of Authorisation

Over and above the management measures detailed Section 11.4, the following conditions should be included in the authorisation:

- The EMPr must be audited in line with the NEMA Regulation 34 timeframes (every 5 years);
- Mogalakwena Complex should continue to reassess the risks and impacts of the development throughout its operational life. Should any change in the risk and impact profile of the development be determined, additional management controls and mitigation measures must be implemented and the EMPr amended to reflect these changes;
- Any substantial change to the project layout as represented in this report must be subjected to review and revision if required;
- Undertake a phase 1 field-based assessment report to assess the value and prominence of fossils in the development area and the effect of the proposed development on the palaeontological heritage;
- Undertake a summer season walkdown of the footprint area is recommended in which all SCC are recorded and marked for permit application purposes (be it for rescue and relocation initiatives, or destruction of the specimens).
- Prior to undertaking the clearing activities associated with the pre-assembly yard area, the following Heritage mitigations and management measures must be adhered to:
 - Develop a 100m wide buffer area around the identified heritage site (MPAY-01 in Figure 10-30) or mitigate the risk for the presence of unmarked graves by:
 - Undertaking a social consultation process to assess whether any local residents or the wider public is aware of the presence of graves at these sites. If the consultation process confirms that graves are located in this area then the following mitigation measures would be required:
 - A grave relocation process must be undertaken.

- A detailed social consultation process, at least 60 days in length, comprising the attempted
 - identification of the next-of-kin in order to obtain their consent for the relocation.
 - Bilingual site and newspaper notices indicating the intent of the relocation.
 - Permits from all the relevant and legally required authorities.
 - An exhumation process that keeps the dignity of the remains and family intact.
 - An exhumation process that safeguards the legal rights of the families as well as that of the mining company.
 - The process must be done by a reputable company well versed in the mitigation of graves.
- All structures and site layouts from each site must be recorded using standard survey methods. The end result would be site layout plans for all these sites.
- A mitigation report must be compiled for these sites within which all the mitigation measures and its findings will be outlined. The recorded drawings from the previous item must also be included in this mitigation report.
 - The completed mitigation report must be submitted to the relevant heritage authorities.
- Monitoring of surface and groundwater will be undertaken in line with the monitoring programmes as detailed in the approved WUL;
- It is reported that certain areas of the pre-assembly yard have been used by communities for grazing purposes. This has not been confirmed however needs to be followed up as part of Mogalakwena's ongoing stakeholder and community engagement relationship building exercise. This will determine if the mine needs to make potential alternative areas outside of the mining right area available to communities for grazing purposes as an offset (further discussed in Chapter 11); and
- Environmental monitoring to be carried out during the different phases of the project as detailed in Section 27.5.

20 Description of any assumptions, uncertainties and gaps in knowledge

The following assumptions, limitations and constraints highlighted and considered as part of the BA for the proposed Projects:

Table 20-1: Assumptions, limitations and constraints

Study	Assumption/limitation/constraint
General assumptions	<ul style="list-style-type: none"> • The impact assessment was conducted based on the design information provided by the client at the time of compiling this report and it is assumed that the proposed activities will be constructed in line with the designs. • The use of areas within the pre-assembly yard project area for community livestock grazing needs to be better understood/confirmed.
Noise	<ul style="list-style-type: none"> • Operations will take place on a 24-hour basis; • The abutting communities are already exposed to some mining activity noises as the Mogalakwena Complex is an operational mine; • Activities associated with the projects will take place on a 24-hour basis; • There were no limitations at the time of compiling the report as all the relevant information per project area was provided by the Environmental Assessment Practitioner.
Floral Ecology	<ul style="list-style-type: none"> • The biodiversity desktop assessment is confined to the study area and does not include detailed results of the surrounding areas or adjacent properties although ecologically important or sensitive areas according to the desktop databases of the surrounding areas have been included on the relevant maps; • Sampling, by its nature, means that not all individuals are assessed and identified. Some species and taxa associated with the study area may have been missed during the assessment. It is, however, expected that most floral communities have been accurately assessed and considered. Relevant online sources, background

Study	Assumption/limitation/constraint
	<p>information, and previous studies (e.g., STS 210037, 2021; STS 210042, 2021; and STS 200035, 2020), were further assessed to improve on the overall understanding of the study area's ecology; and</p> <p>With ecology being dynamic and complex, some aspects (some of which may be important) may have been overlooked. The data presented in this report are based on one site visit undertaken on the 25th – 26th November 2021. A more comprehensive assessment would require that assessments take place in all seasons of the year. However, on-site data were augmented with all available desktop data. Together with project experience in the area the findings of this assessment are considered an accurate reflection of the ecological characteristics of the study area.</p>
Freshwater ecosystem	<ul style="list-style-type: none"> • No freshwater ecosystems were identified within the proposed project footprint, or within 100 m thereof. Single freshwater ecosystems, namely The Mohlosane River and Groot Sandsloot River were identified within 500 m of the proposed project footprints (cable yard and pre-assembly yard respectively), and where accessible was ground-truthed. However, portions of both rivers were delineated in fulfilment of GN509 of the National Water Act, 1998 (Act No. 36 of 1998) using various desktop methods including use of topographic maps, historical and current digital satellite imagery and aerial photographs. • The delineations as presented in this report are regarded as a best estimate of the freshwater ecosystem boundaries based on the site conditions present at the time of assessment. • Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater ecosystems will need to be surveyed and pegged according to surveying principles and with survey equipment. • Wetland, riparian and terrestrial ecosystem zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater ecosystem boundary may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results. • With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. A more reliable assessment of the biota would require seasonal sampling, with sampling being undertaken under both low flow and high flow conditions. However, it is expected that the existing activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of aquatic, riparian and wetland ecology. • With regards to data sources used to provide background information on the sensitivity of the assessed areas, it is important to note that although all data sources provide useful and often verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the study area's actual site characteristics at the scale required to inform the environmental authorisation processes.
Heritage	<ul style="list-style-type: none"> • Not detracting in any way from the comprehensiveness of the fieldwork undertaken, it is necessary to realise that the heritage resources located during the fieldwork do not necessarily represent all the possible heritage resources present within the area. In fact, due to the dense vegetation and steep topographic gradients found within the study area, it is highly likely that the presently identified heritage sites are not a complete record of all the archaeological and heritage resources located within the study area. Such observed or located heritage features and/or objects may not be disturbed or removed in any way until such time that the heritage specialist has been able to make an assessment as to the significance of the site (or material) in question. This applies to graves and cemeteries as well. In the event that any graves or burial places are located during the development, the procedures and requirements pertaining to graves and burials will apply. • The study area boundaries and development footprints used in this report were provided by the client. These were the area assessed during the fieldwork. Should any additional development footprints located outside of these study area boundaries be required, such additional areas will have to be assessed in the field by an experienced archaeologist/heritage specialist and the HIA report updated and approved. This must be completed before construction commences.

Study	Assumption/limitation/constraint
Paleontology	<ul style="list-style-type: none"> • When conducting a PIA several factors can affect the accuracy of the assessment. The focal point of geological maps is the geology of the area, and the sheet explanations were not meant to focus on paleontological heritage. Many inaccessible regions of South Africa have not been reviewed by paleontologists and data is generally based on aerial photographs. Locality and geological information of museums and universities databases have not been kept up to date or data collected in the past have not always been accurately documented. • Comparable Assemblage Zones in other areas is used to provide information on the existence of fossils in an area which was not yet been documented. When similar Assemblage Zones and geological formations for Desktop studies is used it is generally assumed that exposed fossil heritage is present within the footprint.

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

21.1 Reasons why the activity should be authorised or not

The environmental authorisation process associated with the proposed project was undertaken in terms of the relevant environmental authorisation requirements as detailed in Section 6. The environmental authorisation process was underpinned by a stakeholder engagement process with consultation undertaken through various forms of engagement as detailed in Section 9.

During the consultation process, comments which are received will be captured in the CRR (Template provided in Appendix C).

In terms of the locality of the proposed project, areas of sensitivity were taken into consideration during the design phase and were avoided as far as practically possible. Where avoidance could not be achieved in terms of the design requirements of the proposed project, appropriate additional mitigation measures were developed to be implemented to reduce the impacts on the environment, as detailed in Section 11. The proposed mitigation measures were developed based on the nature, duration, severity and probability of the impact and based on the recommendations made by the specialists, as presented in Table 16-2.

In addition, since Mogalakwena Complex is an existing operational mine, mine personnel are presently managing impacts in line with exiting environmental management requirement. These impacts are of a similar nature to the proposed project.

It is SRK's reasoned opinion that this project should be authorised based on the following:

- The impacts which have been identified can be mitigated through the implementation of the existing approved management measures as well as identified additional management measures in Section 11. In addition to this, there are several recommendations for impact management and mitigation which the EAP has made for the Competent Authority to include as part of the conditions of approval (section 19). This will further ensure that Mogalakwena Complex remains committed to manage the impacts as it forms part of the conditions for authorisation.
- The proposed project is unlikely to result in the generation of any significant cumulative impacts when managed in accordance with the management measures specified in Section 11; and
- Should the proposed projects not be implemented, Mogalakwena Complex will continue to operate as it currently operates however:
 - The construction timeframes of the M3C will be hindered due to inadequate laydown area space;
 - The repair of cables for the North Mining section will be delayed due to a need to make use of the existing repair facility which is not located in close proximity to North Mining.

Both of these projects will cumulatively facilitate mining and processing activities at Mogalakwena Complex to ensure that these activities can be optimised and more effectively executed.

22 Period for which the Environmental Authorisation is required

The EA is required for the duration of the LoM which is currently estimated to be beyond 2080.

23 Financial Provision

The infrastructure and activities associated with the proposed pre-assembly yard and cable yard projects will increase the existing Mogalakwena Complex liability by an amount of R8 832 021.28.

AAP will provide for the closure liability associated with the project through the purchase of a Bank Guarantee as allowed by the Financial Provision for Prospecting, Exploration, Mining or Production Operations Regulations, with the Bank Guarantee provided to the DMRE following authorisation of the project.

23.1 Explain how the amount was derived

The liability has been estimated using the approach documented in the “DMR Guideline” (Guideline Document for the Evaluation of the Quantum of Closure-Related Financial Provision Provided by a Mine – 2005). Rates have been annually updated with the prevailing Consumer Price Index (CPI) as obtained from StatsSA. The rates included in the assessment are those relevant for 2022.

23.2 Confirm that this amount can be provided for from operating expenditure

A Bank Guarantee will be provided and can be funded from operating expenditure.

24 Specific Information required by the competent Authority.

24.1 Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998) the BAR report must include the:

24.1.1 Impact on the socio-economic conditions of any directly affected person.

Both of the proposed project areas are situated within the mining right and surface lease areas and will serve as support to existing mining activities. Therefore, due to the nature of the proposed projects, it is not foreseen that there will be any significant negative social impacts which cannot be mitigated in line with the measures currently included in the Complexes existing EMPs. This includes the recommendation that the Social Performance team make contact with the affected community members/herders as part of Mogalakwena Complex's ongoing community engagement. This will assist the team in understanding what grazing land requirements and mitigation of the impact that the proposed pre-assembly yard will have on the use of the existing area for grazing. The positive social impacts can be enhanced especially if the mitigation measures of the EMPs are implemented.

24.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act.

The potential heritage sites associated with this project were identified as part of the Heritage studies conducted at both of the proposed sites (refer to Appendix E). While no impact to heritage sites is anticipated at the proposed cable yard site, it cannot be confirmed if graves are present within the proposed pre-assembly area. The heritage specialist has made several recommendations and the EAP has notified Mogalakwena Complex of these recommendations. These recommendations have also been included in Section 19 – aspects for inclusion as conditions of authorisation as well as in Section 26 – final environmental management programme (EMPr) in order to manage any potential impacts within the proposed pre-assembly yard area.

If graves are found within the pre-assembly yard area, grave relocation will have to be undertaken in line with the requirements of Section 36 of the NHRA and archaeological sites may require mitigation in line with the requirements of Section 35 of NHRA. If it is not possible to preserve graves sites in situ, the required mitigation measures are outlined below:

- A grave relocation process must be undertaken if required;
- A detailed social consultation process, at least 60 days in length, comprising the attempted identification of the next-of-kin in order to obtain their consent for the relocation;
- Bilingual site and newspaper notices indicating the intent of the relocation;
- Permits from all the relevant and legally required authorities need to be obtained;
- An exhumation process that keeps the dignity of the remains and family intact needs to be conducted;
- An exhumation process that safeguards the legal rights of the families as well as that of the mining company needs to be undertaken;
- The exhumation process must be done by a reputable company well versed in the mitigation of graves; and
- Test excavations to physically confirm the presence or absence graves need to be conducted. If no evidence for graves is found, no further mitigation measures would be required; and if evidence for graves is found, a full grave relocation process must be implemented.

The existing chance finds procedure will be implemented to deal with how to protect graves and heritage sites accidentally unearthed during construction.

25 Other matters required in terms of sections 24(4)(a) and (b) of the Act

An impact assessment for the proposed project has been undertaken and will incorporate consultation with and participation of interested and affected parties. Applying the hierarchical approach to impact management were firstly considered to avoid negative impacts, but where avoidance was not possible, to better mitigate and manage negative impacts. Impacts were identified as part of the risk assessment (Part A – Section 11.4) however these impacts were found to be low to moderate (in selected cases) due to the fact that the proposed supporting infrastructure projects will be constructed within the already disturbed areas at Mogalakwena Complex. Therefore, the proposed projects will not result in significant impacts posing a threat on the environment as long as all mitigation measures are adhered to by Mogalakwena Complex.

Part B: Environmental Management Programme Report

26 Final environmental management programme

The structure of the EMPr in terms of Appendix 4 of the 2014 NEMA Regulations, as amended is provided in Table 26-1.

Table 26-1: Structure of the EMPr report in terms of Legislation Requirements as detailed in Appendix 4 (contents of an EMPr of GNR 982)

Appendix 4	Legislated requirements as per the NEMA GNR 982 in Appendix 4	Relevant Report Section
(1)(a)	details of-	
	(i) the EAP who prepared the EMPr	2.1
	(ii) the expertise of the EAP, including a curriculum vitae;	2.2 and Appendix A
(1)(b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	1
(1)(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	Appendix F
(1)(d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	11
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
	(v) where relevant, operation activities;	
(1)(e)	<i>Removed from Appendix 4 during 2017 NEMA Regulations Amendment and included in 1 (f) below</i>	
(1)(f)	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	18 and 23
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(1)(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	27
(1)(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	

Appendix 4	Legislated requirements as per the NEMA GNR 982 in Appendix 4	Relevant Report Section
(1)(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	
(1)(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	
(1)(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	
(1)(l)	A program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	
(1)(m)	an environmental awareness plan describing the manner in which-	27.6
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	27.6.1 and 0
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(1)(n)	any specific information that may be required by the competent authority	0
(2)	Where a government notice gazette by the minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	Noted

26.1 Details of the EAP

Refer to Section 2.1 for the details of the EAP.

26.2 Description of the aspects of the activity

The requirement to describe the aspects of the activity that are covered by the environmental management programme is included in Part A, Section 1.

26.3 Composite map (sensitivity map)

The environmental sensitivities associated with the project is included in Appendix F and include sites of cultural heritage, noise sensitive receptors, floodlines and Zones of Regulation.

26.4 Description of the impact management objectives including the management statements

26.4.1 Determination of closure objectives

The closure objectives detailed in Section 26.5.1 are based on an extensive environmental database and baseline information gathered during the LoM so far, as well as existing environmental baseline studies.

A baseline closure risk assessment was undertaken during 2016 using the Anglo American Plc risk assessment process, where the risk is described and then a determination is taken to assess the nature of the risk and then the risk is ranked according to predetermined criteria for probability and consequence. This baseline was subsequently updated in 2017, 2018, 2019, 2020, 2021 and 2022. The nature of the risks requiring mitigation were used to inform the closure objectives.

26.4.2 Volumes of rate of water use required for the operation

The proposed pre-assembly and cable yard's water requirements for construction will not require additional water supply, all required water will be within the WUL authorised limits. Water for dust suppression will however be required which will be sourced from existing process water sources under the current approved WUL.

26.4.3 Has a water use licence been applied for

No Section 21 water uses requiring authorisation will be triggered by the construction and operation of the proposed cable and pre-assembly yards as well as their supporting infrastructure.

26.4.4 Impacts to be mitigated in their respective phases

The impact assessment in Section 11 details the potential impacts associated with proposed pre-assembly and cable yard projects during the pre-construction, construction, operational and closure and rehabilitation phases.

26.4.5 Impact management outcomes

In addition to the implementation of the management measures detailed in Section 18 the compliance standards that are applicable to the identified impacts and as part greater impacts generated by Mogalakwena Complex are included in Table 26-2.

Table 26-2: Compliance Standards to be achieved with regards to social and environmental aspects

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with relevant legislation and standards
Soils, Land Use and Land Capability Terrestrial Ecology	Continuous during construction, operations and closure.	To prevent soil contamination by implementation of: <ul style="list-style-type: none"> • Inspection and maintenance Plan • Leak/Spill Procedure • Emergency Preparedness Plan • Waste Management Procedure - ZW2L 	<ul style="list-style-type: none"> • Manage soils, if contaminated, in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331) • Anglo American Policies and Guidelines, standards and procedures to manage and remediate spills • National Dust Control Regulations • SANS 10103 - Acceptable Ambient Noise Levels • National Environmental Management: Biodiversity Act • National Environmental Management: Air Quality Act • National Environmental Management Act
	Continuous during construction, operations and closure.	To demonstrate active stewardship of land and biodiversity by: <ul style="list-style-type: none"> • Identifying and removing relevant species if necessary 	<ul style="list-style-type: none"> • Anglo American Biodiversity Performance Standards and Guidelines •
Surface water	Continuous during construction, operations and closure	To avoid or where not possible, minimise and remedy pollution of water <ul style="list-style-type: none"> • Implementing a Leak/Spill Procedure 	<ul style="list-style-type: none"> • Regulation 704 Use of Water for Mining and Related Activities • Compliance with the conditions in the WUL

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with relevant legislation and standards
		<ul style="list-style-type: none"> Continuously implementing the surface water monitoring programme Compiling monitoring report Implementing Stormwater Management Plans; and Responding to complaints and implementing a grievance mechanism. Compliance to WUL 	<ul style="list-style-type: none"> Anglo American Policies, Guidelines and AAP procedures to manage and remediate spills Manage soils in line with the requirements of the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331).
Groundwater	Continuous during construction, operations and closure.	<p>No dirty water spillage to the catchment thereby preventing contamination of waterbodies downstream by:</p> <ul style="list-style-type: none"> Continuously implementing the groundwater monitoring programme and model; and Responding to complaints and implementing a grievance mechanism with regards to groundwater. Compliance to WUL 	<ul style="list-style-type: none"> Anglo American Policies, Guidelines and AAP procedures to manage and remediate spills. Compliance with the conditions in the WUL
Air Quality	Continuous during construction, operations and closure.	<p>To minimise the entrapment potential of dust.</p> <ul style="list-style-type: none"> To keep PM₁₀ (and in the future, PM_{2.5}) and dust fallout levels at key receptor sites around the project area within guideline levels. As the guidelines vary depending on the priority area and year, the South African Air Quality Information System (http://www.saaqis.org.za/) will be consulted for the most recent guidelines. <p>These aforementioned standards will be achieved by:</p> <ul style="list-style-type: none"> Continuously implementing the dust monitoring programme Appropriate dust suppression techniques. 	<ul style="list-style-type: none"> National Dust Control Regulations Anglo Air Quality Performance Standards AA Air quality Guideline
Noise	Continuous during construction, operations and closure	<p>To minimise noise impacts on sensitive receptors by:</p> <ul style="list-style-type: none"> Developing a complaints register to record complaints regarding noise To maintain noise levels at the standards for suburban areas (SANS 10103) as far as practicable 	<ul style="list-style-type: none"> National Dust Control Regulations SANS 10328 of 2008
Cultural Heritage	Continuous during construction, operations and closure	<p>To avoid impacts to cultural heritage resources and enhance cultural significance where possible. Where previously unknown cultural heritage resources are discovered during the project, implement the Mogalakwena Complex chance find procedure.</p>	<ul style="list-style-type: none"> National Heritage Resources Act, 1999 NHRA GNR 548 AASW 3.0 4H AAP Chance Find Procedure
Social	Continuous during construction,	<p>To enhance benefits from the development of the Project;</p>	<ul style="list-style-type: none"> Anglo American Closure Toolbox. Anglo American Social Way 3

Environmental aspect	Phase/Time period	Standard to be achieved	Compliance with relevant legislation and standards
	operations and closure	<ul style="list-style-type: none"> • To maximize opportunities for local residents • To facilitate employment of local labour on the Mine • To avoid creating unrealistic expectations <p>These standards will be achieved by the implementation of the SLP and Social Management Plan, SED Plan, Stakeholder Engagement Plan and other Social Performance policies, procedures and plans.</p>	<ul style="list-style-type: none"> • Anglo American Environmental Way • NEMA Financial Provision Regulations

26.4.6 Impact management actions

Impact management actions are addressed in Section 27. These include:

- Monitoring of impact management actions;
- Monitoring and reporting frequency;
- People responsible for monitoring;
- Specific environmental monitoring requirements;
- The environmental awareness plan; and
- Specific information required by the Competent Authority.

26.5 Financial Provision

Aspects involving the financial provision are addressed in Section 23. This section provides the closure objectives, approach to consultation with the landowner and stakeholders and the rehabilitation plan which will be developed once sufficient information is collected from the monitoring of areas where rehabilitation concurrent with mining activities has been undertaken.

26.5.1 Closure Objectives

Closure objectives for Mogalakwena Complex have been developed as part of the closure plan and include the following:

- Adhere to all statutory and other legal requirements.
- To develop landforms and land-uses that are stable, sustainable and aesthetically acceptable on closure.
- Ensure safety & health of all stakeholders during closure and post closure and that communities using the site after closure are not exposed to unacceptable risks.
- Ensure that closure supports productive uses, where practical, considering pre-mining conditions and agree with commitments to with stakeholders.
- Physically and chemically stabilise remaining structures to minimise residual risks.
- Promote biodiversity and biological sustainability to the maximum extent practicable.
- Utilize closure strategies that promote a self-sustaining condition with little or no need for ongoing care and maintenance.
- To achieve agreed quality targets set by the Catchment Management Agency (CMA) and the DWS as far as practical relative to impacts and reasonability to achieve.

Although the final closure quantum will be refined once the project is completed, commissioned and fully operational, SRK is of the opinion that the estimate of liability is a reasonable reflection of the anticipated

closure costs and is of the opinion that the liability is sufficient for the operation to adhere to the closure objectives. Refer to Appendix I for the calculation of financial provision associated with this project.

26.5.2 Consultation with landowners and interested and affected parties

The objectives in relation to closure and rehabilitation as detailed in Section 26.5.1 is being made available for landowner and public consultation as part of the public participation process detailed in Section 9.

26.5.3 Rehabilitation Plan

The final rehabilitation plan for Mogalakwena Complex will only be developed once sufficient information is collected from the monitoring of areas where rehabilitation concurrent with mining activities has been undertaken. The learnings from the areas already rehabilitated will be utilised to inform scientifically sound, safe and technically feasible solutions to achieving the rehabilitation objectives. The intention of the plan will be to achieve the objectives in Section 26.5.1.

26.6 Closure Actions

The rehabilitation actions that the operation intends undertaking at the end of the life of the proposed pre-assembly yard¹⁵ and cable yard are described below. These are based on the closure actions for the remainder of the operation as described in the Final Decommissioning, Rehabilitation and Closure Plan (FDRCP) (SRK, 2018). These actions are designed to comply with the requirements of this rehabilitation plan's objectives and the requirement for the development of risk mitigation closure strategies identified during the risk assessment. Decommissioning activities will follow the NEMA EIA Regulations for closure of activities associated with mining.

26.6.1 Buildings and Structures

Closure actions for the buildings will include the following:

- The water and power reticulation and associated infrastructure will be retained until such time as water and power are no longer needed on site. Once no longer required, all power and water services to be disconnected and certified as safe prior to commencement of any demolition works;
- All remaining inert equipment and demolition debris will be placed in the base of the nearest open pit;
- Salvageable equipment will be removed and transported offsite prior to the commencement of demolition;
- All fittings, fixtures and equipment within buildings will be dismantled and removed to designated temporary salvage yards until removed as scrap or disposed as waste;
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/chemical residues remain;
- All above ground electrical, water and other service infrastructure and equipment to be removed and placed designated temporary salvage yards until removed as scrap or disposed as waste;
- Electrical, water and other services that are more than 400 mm below ground surface will remain.
- All pipes and structures deeper than 400 mm need to be sealed to prevent possible ingress and ponding of water;
- Concrete slabs and footings will be removed to a depth of 500 mm below ground surface. This concrete (and metal) will be broken up and disposed of in the pit;
- All concrete below 500 mm depth will remain underground with the invert of all structures broken/sealed to prevent possible ingress and ponding of water;
- Soils beneath the storage tanks and chemical storage areas will be sampled. Any contaminated soils found will be removed for disposal as per the mines Waste Management Plan; and

¹⁵ The pre-assembly yard is a temporary facility and will be decommissioned once the M3C has been constructed.

- All excavations resulting from demolition of buildings, roads, etc. and earth structures will be left in a safe manner.

26.6.2 Roads, laydown and parking areas

Mine roads that are not needed for closure and post closure uses at the site (e.g. security and monitoring) will be closed. Where possible the larger roads that are retained will be resized for post closure use by regrading and ripping to a width that is appropriate for anticipated post closure traffic.

Closure actions for the roads, laydown and parking areas will include the following:

- Removal of all signage, fencing, shade structures, traffic barriers, etc;
- All 'hard top' surfaces to be ripped and bitumen removed along with any culverts and concrete structures;
- Where possible preserve existing vegetation – native trees and plants that may currently be incorporated in parking areas;
- All concrete lined drainage channels and sumps to be broken up and removed;
- All excavations or vertical walls resulting from removal of foundations or structures are to have sides slopes battered to 2H:1V and are to be made safe pending final reclamation work;
- All potentially contaminated soils are to be identified and demarcated for later remediation; and
- All roads that have been treated with dust suppression water need to be sampled to determine whether they need to be treated as "sealed" roads with the upper surface ripped and removed and disposed of as per the Mogalakwena Complex Waste Management Plan.

26.6.3 Waste management

Waste will be classified as necessary and then depending on the classification handled according to the mines Waste Management Plan. Likely activities are:

- Designated temporary salvage yards will be developed for the storage of mobile equipment, structural steel and mechanical equipment or other equipment with a potential resale or scrap value. The location of these yards will be dictated by existing permitted land clearance. Material will be stored in these salvage yards until opportunities for resale/reuse are exhausted. Residual material will be managed according to the Waste Management Plan;
- It may be necessary for security reasons to fence temporary salvage yards particularly where these are located close to public roads; and
- Once material is removed from the yards (either through sale or disposal), temporary infrastructure will be demolished, compaction loosed by ripping and the footprint revegetated as per the VMP.

26.6.4 Storm water management

Prior to closure, a water management plan will be prepared to identify which structures are required at closure and which can be decommissioned. Ditches decommissioned will be closed by backfilling the excavations with the material removed and placed adjacent to the structures. Bunds not required will be flattened by redistributing the material across the footprint used to borrow the material for construction.

26.6.5 Fencing and walling

Walls will be demolished by breaking the concrete panels or bricks and mortar and removing support posts from the ground. Rubble and scrap metal will be recycled and where there are not alternatives be disposed to landfill. Excavations for support posts will be backfilled with growth medium. The footprints of the demolished walls will then be rehabilitated as per the footprints for other infrastructure being demolished.

Security fencing around individual infrastructure will be removed once fences are redundant. Support posts will be removed by excavating to base level.

26.6.6 Vegetation and wildlife

Successful revegetation will help control erosion of soil resources, maintain soil productivity and reduce sediment loading in streams. As part of biodiversity management, revegetation will enhance the resulting biodiversity opportunities by utilizing non-invasive plants that fit the criteria of the habitat (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided, and the area will be managed to control the spread of these species.

The slopes at the mine residue facilities are likely to be susceptible to erosion, even after reshaping the facilities to a lower gradient. To counter the effects of erosion, naturally occurring grassland species will be planted on the slopes and tops of the facilities. At this time, these species will provide soil holding capacity and reduce runoff velocity. The composition of the natural species and their planting strategy will be determined through revegetation trials conducted concurrently with mining.

The flatter areas, such as those not on mine residue facilities, will be revegetated with the objective of creating a sustainable ecosystem similar to an analogous reference plots.

No specific measures will be taken to reintroduce wildlife as the different animals still occupying the remaining habitat are expected to expand their territories into the Mogalakwena Complex area.

26.7 Future land use after decommissioning

Post closure land use (PCLU) is determined in consultation with stakeholders so that the PCLU meets the requirements of the stakeholders, within the context of what can reasonably be achieved on site. This activity is undertaken for the whole mine lease area affected by mining activities and integrates stakeholder requirements with risk mitigation. As specific consultation regarding PCLU has not been undertaken at this stage of the closure process for the project nor has it been undertaken for the larger mining right area, for purposes of current planning and liability costing for the project, various assumptions relating to closure have been developed.

Given the extent of the disturbance within the lease area, with the majority of the disturbance remaining post closure in the form of mine residues (tailings and waste rock) and various open pits, post closure land use is unlikely to contain alternatives that could be utilised sustainably by the community. However, should infrastructure be demolished, there are opportunities that the footprints could be utilised for sustainable post closure uses.

Based on the limitations presented by the permanence of the disturbances associated with the mining activities, the overall post closure land use for the mine has been determined to be:

- Landforms, that sustain indigenous vegetation which limits water and wind erosion.
- Mosaic of nodes where existing infrastructure is utilised by stakeholders for a variety of post closure activities surrounded by areas rehabilitated back to a land capability possible of supporting indigenous vegetation as well as land capable of supporting the various community initiatives in which the mine is involved.

The land capability developed on the footprints where covers are placed, and vegetation established will be a land capability defined as grazing by the Chamber of Mines¹⁶, with these covers expected to support landforms that support indigenous vegetation. Flat areas where decommissioning activities are undertaken will be converted to a mosaic of land where the intended use is industrial and agricultural.

¹⁶ Now known as Minerals Council South Africa

As the nature of the disturbance associated with the project is similar to that which already exists for the operational infrastructure, the PCLU for the project is aligned with the above.

As the demographics of the areas surrounding the mine may change at closure as communities potentially move in seek of other livelihoods, pressures on the land may reduce. This may however, be countered by population growth between now and when the mine closes. It is likely that for the next 20 to 30 years, land use will be associated with mining and will remain so until closure. After closure, the mine is likely to enter into a period of care and maintenance on the rehabilitated areas, further limiting opportunities for community use. However, once sufficient data has been obtained to indicate that the mine has met its relinquishment criteria, use of rehabilitated areas may commence.

27 Mechanisms for monitoring compliance with and performance assessment against the environmental management programme

Internal and external environmental monitoring is undertaken on an ongoing basis at Mogalakwena Complex as required in the relevant authorisations, permits and licences. Details associated with the compliance monitoring is provided in the sections below.

27.1 Monitoring of Impact Management Actions

A performance assessment against this BA/EMPr, will be undertaken five years in line with the requirements of Regulation 34 of NEMA to assess the compliance against the management measures included in Section 11.4.

27.2 Monitoring and Reporting Frequency

Environmental monitoring for the proposed project will be undertaken in line with the current environmental monitoring programme in place at Mogalakwena Complex. This monitoring includes:

- Surface water monitoring – monthly
- Groundwater monitoring – quarterly
- Air quality (dust fallout and PM) – monthly
- Noise monitoring – quarterly (initially for year 1) after which the frequency will change to an annual basis

The team at Mogalakwena Complex (refer to Section 2.3) ensure that the monitoring programme is implemented in line with the requirements of the approved EMPs. Various sub-consultants are appointed to undertake the environmental monitoring on behalf of Mogalakwena Complex.

27.3 Responsible Persons (Roles and Responsibilities)

The responsible persons for the implementation of the management measures and the monitoring of environmental compliance at Mogalakwena Complex is provided in Table 2-5.

27.4 Time Period for Implementing Impact Management Actions

The development of the proposed pre-assembly yard is aligned with the construction timeframe of the M3C whereas the developed of the proposed cable yard is aligned with the planned LoM of Mogalakwena Complex. The time period for the implementation of the management actions associated with the

development of the projects will be aligned with the different phase of the activities as detailed in Section 11.4.

27.5 Specific environmental monitoring requirements

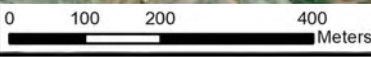
This section details the existing specific environmental monitoring requirements associated with the project and includes the monitoring of the following:

- Surface and ground water (Figure 27-1);
- Air quality (Figure 27-2); and
- Noise (Figure 27-3).



Legend

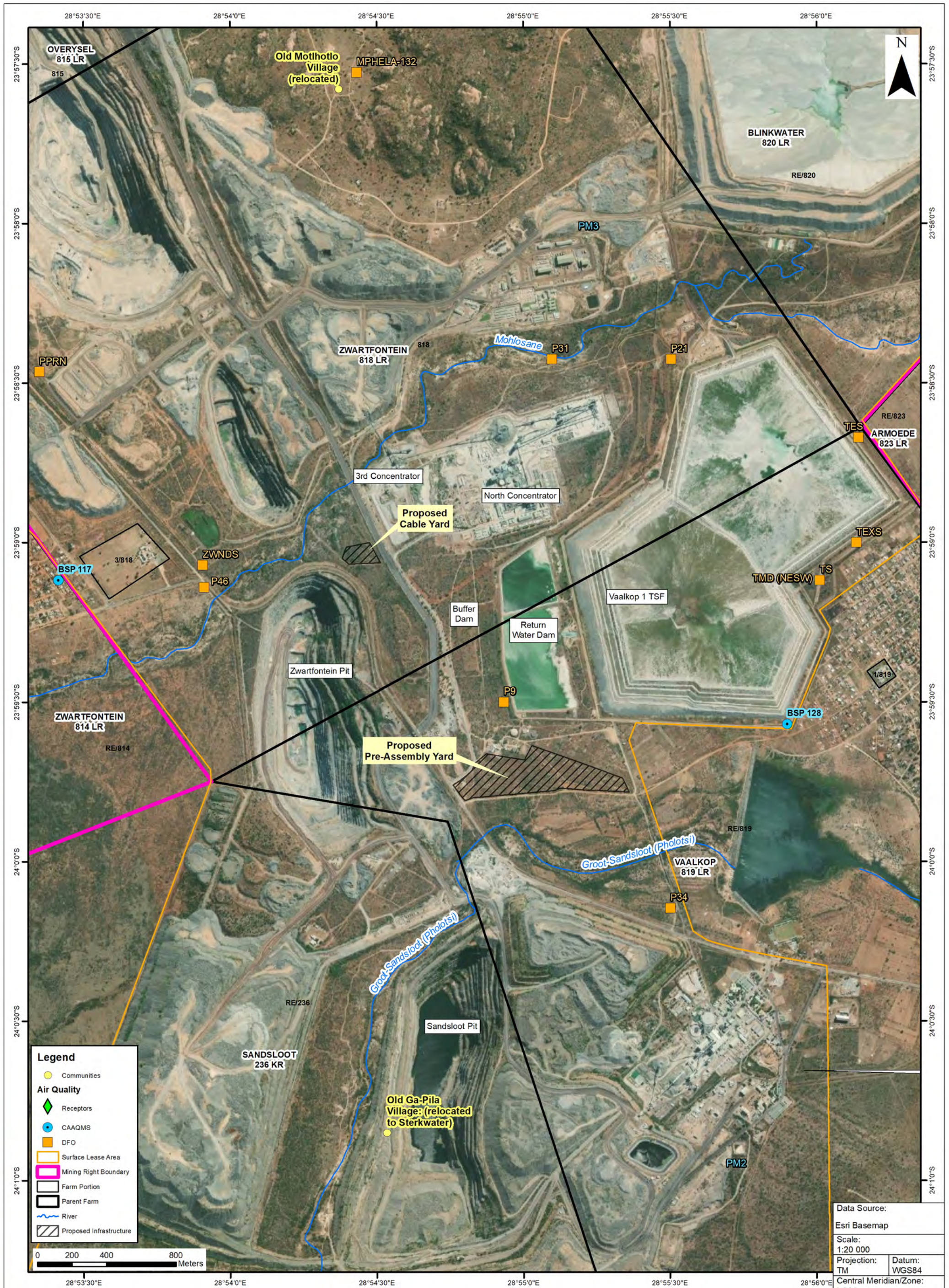
- Communities
- Surface Water Monitoring Points
- Groundwater monitoring
- Surface Lease Area
- Mining Right Boundary
- Farm Portion
- Parent Farm
- ~ River
- Proposed Infrastructure



Data Source:	
Esri Basemap	
Scale: 1:10 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date: 07/09/2022	Compiled by: LOUA
Project No. 575107	Fig No. 27-1
Revision:	Date:



MOGALAKWENA COMPLEX - COMBINED BASIC ASSESSMENT
SURFACE WATER AND GROUNDWATER MONITORING MAP



MOGALAKWENA COMPLEX - COMBINED BASIC ASSESSMENT
AIR QUALITY SAMPLING LOCATIONS



Data Source:	
Esri Basemap	
Scale: 1:20 000	
Projection: TM	Datum: WGS84
Central Meridian/Zone: LO29	
Date: 07/09/2022	Compiled by: LOUA
Project No. 575107	Fig No. 27-3
Revision:	Date:

27.5.1 Surface and groundwater

Mogalakwena Complex has an extensive monitoring program which has been aligned with BPG G3 (DWAF, 2006), as well as the objectives set out in the Anglo Water Management Guideline (GTG 21). According to the Anglo guideline this program must include as a minimum:

- responsibility for the monitoring program;
- locations of routine samples to be taken and purpose;
- required sampling and preservation guidelines (surface / groundwater);
- analytical parameters required per sample;
- frequency of sampling;
- sample quality/custody controls; and
- data management, and reporting.

Sampling of surface water and groundwater is done by Mogalakwena Complex staff and external appointed companies.

Water resources are currently monitored in the Mohlosane and Groot Sandsloot (Pholotsi) River, upstream and downstream of mining activities and on Vaalkop Dam. Samples are submitted to an approved laboratory for analyses and check samples are sent to the SABS laboratories to verify results. Surface, process and groundwater are monitored monthly, and rest water levels are measured biannually.

The sampling protocol is reviewed every two years and all parties involved in the monitoring are informed of updates (Groundwater and Surface water Monitoring Procedures MS-SHE-ENV-PRO-0009 and MS-SHE-ENV-PRO-0004, respectively).

Mogalakwena Complex's WULs identifies the groundwater and surface water monitoring points required to be sampled. The monitoring program has expanded considerably since the issuing of these WULs. The intention of the WULs is to guide the protection of the resource and downstream users. The current monitoring program in place is designed to:

- Monitor process water, discharges, effluents and receiving water to identify impacts caused by Mogalakwena Complex operations;
- Measure compliance to WUL;
- Determine the extent of groundwater pollution plumes;
- Determine the fitness for use of water for potential downstream/down gradient users;
- Inform Mogalakwena Complex's water management strategy, which is reliant on the implementation of a well-designed and maintained monitoring program and database.

Quantity monitoring includes water consumption and metering of the various water and waste streams on the mine. The data is reflected in the mine water balance.

Surface and groundwater monitoring will be undertaken in line with the requirements specified in the WUL, which includes additional monitoring points identified in the 2020 WUL.

27.5.2 Biomonitoring

Stream assessment scoring system (SASS5) aquatic biomonitoring is not undertaken at Mogalakwena Complex due to the intermittent flows experienced in the rivers only during rainfall events and the main river flow being subsurface. Mogalakwena Complex requested that the biomonitoring conditions within the 2007 WUL be removed and this was granted by the Department in 2010. As a result, biomonitoring has not been conducted regularly at Mogalakwena Complex, however, habitat assessments of the rivers have been undertaken during specialist field investigations. As per the 2020 WUL Amendment meeting held on 14 May 2021, DWS indicated that Mogalakwena Complex must comply with Appendix IV, Condition 2.3.1, which indicates that Mogalakwena Complex must develop a site-specific programme for

monitoring mine impact on the biological systems in the water environment. This programme must be submitted to DWS.

27.5.3 Air quality monitoring

Air quality at Mogalakwena Complex is monitored through 32 DFO monitoring points situated across the mining area. Currently the DFO sampling stations consist of 18 residential area DFO units and 13 non – residential area DFO units. Four CAAQMS monitoring points are located along the Complex’s mining right boundary. Installation of the CAAQMS only took place in April 2022. One of the four sites was vandalised shortly after installation therefore data has been obtained from the three remaining monitors. . The location of the monitoring stations is listed in Table 10-18 and shown in Figure 10-23.

27.5.4 Noise monitoring

The location of the monitoring points is listed in Table 10-9 and shown in Figure 10-22. The Noise Impact Management Plan for the proposed project is shown in Table 27-1.

Table 27-1: Noise monitoring plan for the mine proposed projects

Action	Description	Frequency	Responsible person
Management objective	To ensure that the legislated noise levels will always be adhered to.	Annual noise surveys to verify the recommended prevailing noise levels according to SANS 10103 of 2008.	The engineer during the construction phase and the responsible person (Mogalakwena Environmental Department) during the operational phase of the project
Monitoring objective – Construction phase	Measure the environmental noise levels during the construction phase of the project to ensure compliance to the recommended noise levels.	Surveys to verify the recommended prevailing noise levels according to SANS 10103 of 2008.	Mogalakwena Environmental Department
Monitoring objective – Operational phase	Measure the environmental noise levels during the operational phase of the project to ensure compliance to the recommended noise levels.	Surveys to verify the recommended prevailing noise levels according to SANS 10103 of 2008.	Mogalakwena Environmental Department
Monitoring technology	The environmental noise monitoring must take place with a calibrated Class 1 noise monitoring equipment.	Surveys to verify the recommended prevailing noise levels according to SANS 10103 of 2008.	Mogalakwena Environmental Department
Specify how the collected information will be used	The noise data will have to be discussed after each monitoring period and proactive measures to be implemented if the threshold of 70.0dBA were exceeded.	After each monitoring session.	Mogalakwena Environmental Department
Spatial boundaries	At the boundaries of the identified abutting communities as well as at the boundaries of the different mining areas.	Annually	Mogalakwena Environmental Department

Action	Description	Frequency	Responsible person
Define how the data will be analysed and interpreted and how it should be presented in monitoring reports	Reports must be compiled for each monitoring cycle and the results must be compared to the previous set of results to determine if there was a shift in the prevailing ambient noise.	Surveys to verify the recommended prevailing noise levels according to SANS 10103 of 2008.	Mogalakwena Environmental Department
Accuracy and precision of the data	The noise surveys will have to be conducted in terms of the recommendations of the Noise Control Regulations and SANS 10103 of 2008.	Calibrated equipment must be used at all times.	Environmental noise specialist

27.5.5 Soils

During the rehabilitation of the impacted areas soil quality monitoring should be carried out to accurately determine the fertiliser requirements that will be needed. Additional soil sampling should also be carried out on the re-instated soils as required until the levels of nutrients are at the required levels for sustainable growth.

Once the desired nutritional status has been achieved, it is recommended that the interval between sampling is increased. An annual environmental audit should be undertaken as part of the monitoring strategy.

If growth problems develop, ad hoc, sampling should be carried out to determine the problem.

Monitoring should always be carried out at the same time of the year and at least six weeks after the last application of fertilizer.

Soils should be sampled and analysed for at least the following parameters for rehabilitation purposes:

- pH (H₂O)
- Phosphorus (Bray I)
- Electrical conductivity
- Calcium mg/kg
- Cation exchange capacity
- Sodium mg/kg;
- Magnesium mg/kg;
- Potassium mg/kg
- Zinc mg/kg;
- Clay Organic matter content (C %)

The following management and maintenance is also recommended:

- During rehabilitation and the establishment of the vegetative cover the sites must be fenced, and all animals kept off the area until the vegetation is self-sustaining;
- Newly seeded/planted areas must be protected against compaction and erosion ;
- Traffic should be limited where possible while the vegetation is establishing itself;
- Plants should be watered and the sites weeded as required on a regular and managed basis where possible and practical;
- Check for pests and diseases at least once every two weeks soon after planting, and treat if necessary;
- Replace unhealthy or dead plant material;

- Planted (Hydro seeded and grassed) areas should be fertilised soon after germination, and
- Repair any damage caused by erosion

27.5.6 Floral Monitoring

A floral monitoring plan must be designed and implemented throughout all phases of the proposed mining project, should it be authorised. The following points aim to guide the design of the monitoring plan, and it must be noted that the monitoring plan must be continually updated and refined for site-specific requirements:

- Permanent monitoring plots must be established within (target area) and surrounding (reference area) all rehabilitated areas. These plots must be designed to accurately monitor the following parameters:
 - Species diversity and species abundance;
 - Recruitment of indigenous species and of alien and invasive species, including alien vs Indigenous plant ratios;
 - Erosion levels and the efficacy of erosion control measures; and
 - Vegetation community structure including species composition and diversity which should be compared to pre-development conditions and work towards the post-closure objective.
- Monitoring of all the natural areas should continue throughout the operational phase to ensure these systems are not adversely affected by associated activities;
- The rehabilitation plan must be continuously updated (i.e., adaptive management) in accordance with the monitoring results to ensure that optimal rehabilitation measures are employed. Adaptive management is an integral part of any rehabilitation plan as it assesses monitoring results to allow rehabilitation measures to be revisited and to be adapted accordingly;
- Results of the monitoring activities must be considered during all phases of the proposed project and action must be taken to mitigate impacts as soon as negative effects from mining activities become apparent; and
- The method of monitoring must be designed to be subjective and repeatable to ensure consistent results.

27.5.7 Closure and post closure monitoring period

A post closure monitoring period of ten years is considered by AAP to be sufficient time as biological process can be demonstrated to be occurring, leading to vegetation covers being stable and sustainable, within this timeframe. Furthermore, sufficient data can be collected to demonstrate that the achievement of the specific relinquishment criteria comply with the trend for the biophysical category under consideration.

27.5.8 Continuous maintenance

The mine undertakes continuous maintenance on infrastructure that has the potential to affect the environment. This maintenance will be extended to include infrastructure associated with these projects.

27.5.9 Frequency of the submission of the performance assessment report

A formal audit of the performance assessment of the EMP_r will take place every 5 years.

27.6 Environmental Awareness Plan

The proposed project will utilise the existing Mogalakwena Complex SHE Way System Procedure – Competence - attached in Appendix G.

27.6.1 Manner in which the applicant intends to inform his or her employees of any environmental risk which may result from their work.

The proposed project will utilise the existing Mogalakwena Complex SHE Way System Procedure – Competence - attached in Appendix G.

27.6.2 Manner in which risks will be dealt with in order to avoid pollution or the degradation to the environment

The proposed project will utilise the existing Mogalakwena Complex SHE Way System Procedure – Competence - attached in Appendix G.

27.7 Specific information required by the Competent Authority

The following information will be required by the competent authority:

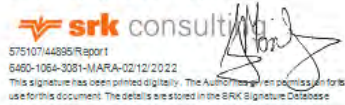
- Quantum of Financial Provision – to submitted annually; and
- Environmental Audit Report on the authorised BAR and EMPr –In line with the NEMA Regulation 34 timeframes (every 5 years).

28 Undertaking

I Ashleigh Maritz herewith confirm:

- The correctness of the information provided in the reports;
- The inclusion of comments and inputs from stakeholders and Interested and Affected parties
- The inclusion of inputs and recommendations from the specialist reports where relevant; and
- The acceptability of the project in relation to the finding of the assessment and level of mitigation proposed.

SRK Consulting - Certified Electronic Signature



Signature of the EAP

DATE: 4 December 2022

29 Declaration

I Ashleigh Maritz herewith declare that:

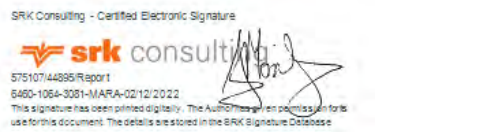
- All reasonable measures have been taken to identify potential I&APs for purposes of conducting public participation on the application;
- As far as is reasonably possible and taking into account the specific aspects of the application,
 - (a) information containing all relevant facts in respect of the application or proposed application has been made available to potential I&APs; and
 - (b) participation by potential or registered I&APs has been facilitated in such a manner that all potential or registered I&APs have been provided with a reasonable opportunity to comment on the application or proposed application;

SRK Consulting - Certified Electronic Signature
The image shows the SRK Consulting logo, which consists of a stylized orange and red 'S' shape followed by the text 'srk consulting'. To the right of the logo is a handwritten signature in black ink. Below the logo and signature, there is a block of small text providing technical details about the digital signature.
575107/44895 Report
6460-1064-3081-MARA-02/12/2022
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Signature of the EAP

DATE: 4 December 2022

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