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FORZANDO COAL MINES (PTY) LTD

FORZANDO NORTH COAL MINE

UPDATE AND AMENDMENT OF THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

FINAL FOR CONSIDERATION

AUGUST 2023

REFERENCE NO.: MP 30/5/1/2/3/2/1 (381MR) EM

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DOCUMENT CONTROL

Role	**Name**	**Signature**	**Document Version**	**Date**
Authors:	Jane Barrett Cert. Sci. Nat		Draft for Internal Review Update with PPP comments	10 July 2023 17 August 2023
Review:	Lelani Claassen Pr. Sci. Nat Registered EAP		Internal Review	14 July 2023
Approval:	Ken van Rooyen Pr. Sci. Nat		Approval	14 July 2023

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LIST OF ACRONYMS:

ACRONYM:	DESCRIPTION:
AEL	Atmospheric Emissions License in terms of NEMAQA
AQMP	Air Quality Management Plan
BAR	Basic Assessment Report
BBBEE	Broad-Based Black Economic Empowerment
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983) as amended
dBA	Decibels
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation in terms of NEMA
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECA	Environmental Conservation Act, 1989 (Act No 73 of 1989)
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment (process or report)
EIA Regs.	Environmental Impact Assessment Regulations published under NEMA
EMPr	Environmental Management Programme
GHG	Greenhouse Gas
GN	General Notice (issued under an Act, providing notice or instructions in terms of Regulations)
HIA	Heritage Impact Assessment
HGM	Hydrogeomorphic
HPA	Highveld Priority Area
I&AP	Interested and Affected Parties
ISSP	International Society of Sustainability Professionals
LoM	Life of Mine
MBSP	Mpumalanga Biodiversity Sector Plan
MHSA	Mine Health and Safety Act (Act 29 of 1996) as amended
mm	Millimetres
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002) as amended
MRA	Mining Right Area
MSDS	Material Data Safety Sheets
MTPA	Mpumalanga Tourism and Parks Agency
NAAQS	National Ambient Air Quality Standards
NAEIS	National Atmospheric Emissions Inventory System

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ACRONYM:	DESCRIPTION:
NEMAQA	National Environmental Management: Air Quality Act (Act 59 of 2008) as amended
NEMBA	National Environmental Management: Biodiversity Act (Act 10 of 2004) as amended
NEMPAA	National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended
NEMWA	National Environmental Management: Waste Act (Act 39 of 2004) as amended
NEMA	National Environmental Management Act (Act 107 of 1998) as amended
NGERs	National Greenhouse Gas Emissions Reporting Regulations, 2017 (Notice 275 of 2017)
NHRA	National Heritage Resources Act (Act No. 25 of 1999) as amended
NPAES	National Protected Areas Expansion Strategy
NSR	Noise-sensitive Receptors
NWA	National Water Act (Act 36 of 1998) as amended
OHSA	Occupational Health and Safety Act (Act 85 of 1993)
PCDs	Pollution Control Dams
PES	Present Ecological State (usually followed by category A-F)
$PM_{10/5/2.5}$	Particulate Matter up to 10/5/2.5 micrometres
PPP	Public Participation Process
REC	Recommended Ecological Category
RLT	Rapid Load Terminal
RoM	Run of Mine
SAGERS	South African Greenhouse Gas Emissions Reporting System
S&LP	Social and Labour Plan
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SANS	South African National Standard (followed by standard number)
SAPAD	South African Protected Areas Database
SCC	Species of Conservation Concern
SEA	Sustainability Excellence Associate
SHE	Safety, Health and Environment
SPLUMA	Spatial Planning and Land Use Management Act (Act No.16 of 2013)
WML	Waste Management Licence in terms of NEMWA
WUL	Water Use License
WULA	Water Use License Application

1 INTRODUCTION

Forzando North is an operational coal mine, located within the Bethal Magisterial District of Mpumalanga. The Mine has an approved Mining Right (MP30/5/1/2/2/381MR) and Environmental Management Programme (EMPr) in terms of the Mineral and Petroleum Resources Development Act, Act 28 of 2002 (MPRDA), as well as separate environmental authorisation(s) in terms of the National Environmental Management Act, Act 107 of 1998 (NEMA) and the National Environmental Management Waste Act, Act 59 of 2008 (NEMWA) for ancillary activities.

Forzando Coal Mines (Pty) Ltd has applied to expand the existing Mining Right Area, in terms of Section 102 of the MPRDA, to incorporate contiguous areas currently held under the following Prospecting Rights: 17030PR, 15106PR, and 14478PR on the farms Bankpan 225 IS and Killowen 465 IS. Simultaneous to this, Forzando Coal Mines (Pty) Ltd has submitted an application for Environmental Authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998 (NEMA), and the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) for Listed Activities associated with the annexation of these Rights, and ancillary infrastructure.

Furthermore, Forzando Coal Mines (Pty) Ltd seeks to amend and update the existing EMPr as per the recommendations of the recent Compliance Audit (EIMS, 2022a).

This report constitutes the amended and updated EMPr for Forzando North Coal Mine.

1.1 Purpose of this Report

The purpose of the EMPr is to specify the proposed management, mitigation, protection or remedial measures that must be implemented to address the environmental impacts that have been identified for the life of mine (LoM). The EMPr also contains the criteria against which environmental performance and compliance must be measured.

The EMPr is a considered a working document to enable effective environmental management at Forzando North Coal Mine, throughout all phases of the operations.

Forzando Coal Mines (Pty) Ltd (the Holder of the Mineral Right), their contractors and subcontractors will be subject to the provision of the EMPr.

1.2 Structure of this Report

The required content of an EMPr is provided in Appendix 4 of the EIA Regulations, 2014 (as amended), and shown in Table 1 with cross-references to the relevant section(s) of this report.

Table 1: Structure of the EMPr

No	Requirement	Section of this report
1	An EMPr must comply with section 24N of the Act and include—	
(a)	details of– (i) the Environmental Assessment Practitioner (EAP) who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 2.2 Section 2.3 Appendix C of the BAR

No	Requirement	Section of this report
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 5
(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 should be avoided, including buffers;	Plan 8 - Plan 10
(d)	a description of the impact management outcomes, 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 — (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;	Section 9
(e)	- (repealed)	n/a
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (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 provision for rehabilitation, where applicable;	Table 10
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 11
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Table 11
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Table 10
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Table 10
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Table 10
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 10.2
(m)	an environmental awareness plan describing the manner in which—	Section 11

No	Requirement	Section of this report
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority.	None

2 CONTACT DETAILS

2.1 Details of the Applicant

The Forzando North operations are owned and operated by Forzando Coal Mines (Pty) Ltd, a subsidiary of the Overlooked Group of Mines.

Table 2: Applicant details

Project applicant:	Forzando Coal Mines (Pty) Ltd		
Registration no (if any):	1970/000578/07		
Trading name (if any):	n/a		
Responsible Person, (e.g. Director, CEO, etc).:	General Manager, Technical and Sustainability		
Contact person:	Setlogelo David Kobuoe		
Physical address:	5th Floor Park Lane West 97 Amarand Avenue Menlyn Maine, Pretoria		
Postal address:	P.o.Box 25307 Monument Park Pretoria		
Postal code:	0105	Cell:	082 411 0898
Telephone:	011 441 6879	Fax:	n/a
E-mail:	david.kobuoe@overlooked.co.za		

2.2 Details of the EAP

Cabanga Environmental has been appointed as the independent Environmental Assessment Practitioner (EAP) for the proposed Project. The details of the persons who prepared this report are provided in Table 3.

Table 3: Project Team

Author	**Jane Barrett**
Highest qualification	BSc Environmental Management & Botany
Years' experience	12+years
Professional registration	South African Council for Natural Scientific Professions (SACNASP): Cert Sci. Nat. 130485 Sustainability Excellence Associate (SEA) certified with the International Society of Sustainability Professionals (ISSP) and the Green Business Certification Inc. Credential ID: 0011543107
Review & EAP	**Lelani Claassen**
Highest qualification	BSc Hons Environmental Management
Years' experience	12+ years
Professional registration	Registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioner's Association of South Africa (EAPASA). Registration Number 2018/153. SACNASP: Pr. Sci. Nat (Reg. 121645)
Approval	**Ken van Rooyen**
Highest qualification	MSc Geography
Years' experience	30+ years
Professional registration	SACNASP: Pr. Sci. Nat (Reg. 400121/93)

2.3 Summary of Past Experience

Jane Barrett is an experienced environmental and sustainability consultant with a demonstrated history of leading and executing complex projects. She holds a BSc degree in Environmental Management and is currently enrolled for a Diploma in Greenhouse Gas Measurement, Reporting and Verification. She has successfully completed certificated courses in Project Management; Carbon Foot printing; and Environmental, Social and Governance Reporting.

She has a good understanding of Environmental Legislation, and its application to factual scenarios. Her experience includes but is not limited to: Environmental Impact Assessments; Environmental Management Plans; Monitoring and Compliance Reporting; Environmental Auditing; Water Use Licensing; Mineral Right Applications; Pre-feasibility and Feasibility Studies.

Jane is registered with the South African Council for Natural Scientific Professions (SACNASP) (Environmental Science) (Cert. Sci. Nat 130485).

Lelani Claassen started her career as an environmental consultant in 2008. She holds an Honours degree in Environmental Management from UNISA, which she completed whilst working as an environmental consultant following the successful completion of a BSc Degree

in Landscape Architecture from the University of Pretoria. She has also successfully completed the SABS Short-course: Environmental Legal Requirements for ISO 14001 compliance.

Her project experience is extensive in scope and covers various aspects of development including residential developments, filling stations and depots, infrastructure, and mining projects. Lelani's experience includes environmental authorisation processes, concept (Fatal Flaw), Pre-Feasibility and Feasibility Studies, environmental compliance audits and environmental-legal compliance assessments. She also has experience as an Environmental Control Officer on construction projects.

Lelani is a Registered EAP (Registration Number 2018/153) with the EAPASA, the only Registration Authority for EAPs in South Africa in terms of Section 24H of the NEMA. Lelani is also a Registered Scientist with SACNASP (Environmental Science (Pr. Sci. Nat 121645).

Ken van Rooyen started his career working as an Exploration Geologist in 1987 after which he specialised in Environmental Management, working both within the Mining Industry and then as an Environmental Consultant.

His main areas of interest are:

- the design, management and repair of mine residue facilities;
- rehabilitation planning and modelling;
- risk assessment; and
- quantifying environmental liabilities.

He obtained a Masters degree in Geography based on his final dissertation entitled "An integrated method of coal discard and slurry disposal to reduce the environmental impact from coal residue".

Ken's project experience is extensive in scope and covers various developments including agricultural and residential developments, power generation, infrastructure, and mining projects. In addition to working on projects throughout South Africa, Ken has worked in Botswana, Mozambique, Zimbabwe, Zambia, Madagascar, Sierra Leone, Rwanda, Mali, Nigeria, and the United States of America.

He has presented at numerous local and international forums on issues such as waste management, integrated environmental management, and sustainability. As well as represented companies on various committees and advisory groups e.g. the Atmospheric Pollution Prevention Committee, the Water Research Commission (Vaal Barrage), the National Groundwater Quality Management Strategy Advisory Group, the Inkomati-Usuthu Catchment forum and many more.

Ken is registered with SACNASP (Environmental Science) (Pr. Sci. Nat 400121/93).

3 POLICY & LEGISLATIVE CONTEXT

A comprehensive discussion on the laws, regulations and policies is contained in Section 5 of the Basic Assessment Report (BAR) (Cabanga Environmental, 2023). This section of the EMPr aims to summarise the most pertinent legal requirements, guidelines and standards relevant to the Forzando North Coal Mine.

Table 4: Summary of Applicable National Legislation

Title	Summary	Relevance to the Project
Constitution of the Republic of South Africa, Act 108 of 1996.	The constitution is the supreme law of the country. Law or conduct that is inconsistent with the provisions of the Constitution are invalid (Section 2). Chapter 2 details the Bill of Rights. Section 24 guarantees everybody's right to an environment that is not harmful to their health or wellbeing, and to have the environment protected for the benefit of present and future generations. Section 24 (b) promotes legislative and other measures that prevent pollution and ecological degradation, promotes conservation, and secures ecologically sustainable development and the use of natural resources while promoting justifiable economic and social development.	The National Legislative Context in terms of NEMA and other laws was developed in line with the constitutional obligations. The Applicant/Holder takes cognisance of the relevant legislative framework. Activities at Forzando North Coal Mine must be undertaken with due cognisance of the constitutional obligations of the Holder of the Mining Right (Forzando Coal Mines Pty Ltd), not to threaten the rights of people to an environment that is safe and healthy.
Mineral and Petroleum Resources Development Act, 2002 (MPRDA) (Act No. 28 of 2002) and its Regulations.	The MPRDA is the predominant piece of legislation dealing with the acquisition of rights to search for, extract and process mineral resources in South Africa. The MPRDA came into effect on 1 May 2004. The MPRDA holds that mineral resources in South Africa belong to the Nation and that the State is the custodian thereof. Any person may apply for a mineral right by following the application procedure set out in the MPRDA and administrated by the DMRE. Applications for rights must be accepted if the application requirements are met, and if no other person holds a prospecting right, mining right, mining permit or retention permit for the same mineral on the same land. The MPRDA further states that nobody may prospect or mine without environmental authorisation (Section 5A) in terms of the NEMA.	Forzando Coal Mines (Pty) Ltd has a converted Mining Right (MP30/5/1/2/2/381MR) in terms of item 7(3) in Schedule II of MPRDA for its operations at Forzando North Coal Mine. The Converted Mining Right (381 MR) was granted in November 2011 and executed on 28 June 2013. The Mine originally operated under an old order Mining Right approved in terms of the Minerals Act, 1991 (Act No 50 of 1991). Forzando Coal Mines (Pty) Ltd submitted an application in terms of Section 102 to amend their Mining Right and EMPr on 21 March 2023. The application relates to the extension of the existing MRA by inclusion of contiguous areas which are held under Prospecting Rights 17030PR, 15106PR and 14478PR.

Title	Summary	Relevance to the Project
	Section 102 of the MPRDA further states that "*A reconnaissance permission, prospecting right, mining right, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right and production right work programme; mining work programme, environmental management programme, and environmental management plan 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, mineralised bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister*".	
Mineral and Petroleum Resources Development Amendment Act, 2008 (Act No. 49 of 2008) (MPRDAA).	The MPRDAA of 2008 amended certain sections of the MPRDA to make the Minister of Mineral Resources the responsible authority for implementing environmental matters in terms of the NEMA as it relates to mining and prospecting operations and incidental activities, and to align the MPRDA with NEMA.	The Department of Mineral Resources and Energy (DMRE) has been identified as the Competent Authority.
Mining Charter, 2018	Section 100(2)(a) of the MPRDA empowers the Minister to develop a Broad-Based Black Economic Empowerment (BBBEE) Charter for the South African Mining and Minerals Industry ("Mining Charter") as a regulatory instrument. One of the objectives of the MPRDA and Mining Charter is to ensure the attainment of Government's objectives to redress historical socio-economic inequalities, to ensure broad-based economic empowerment and the meaningful participation of Historically Disadvantaged Persons in the mining and minerals industry.	Forzando Coal Mines (Pty) Ltd is a Level 1 BBBEE contributor with 100% black ownership. Procurement and employment will be undertaken in accordance with the Mine's approved Social and Labour Plan (S&LP).

Title	Summary	Relevance to the Project
Mine Health and Safety Act, 1996, (MHSA) and its Regulations.	Regulation 17(8) of the MHSA Regulations state that "no person may erect, establish or construct… any structures whatsoever within a horizontal distance of 100 (one hundred) metres from workings, unless a lesser distance has been determined safe by a professional geotechnical specialist and all restrictions and conditions determined by him or her or by the Chief Inspector of Mines are complied with."	Forzando North is mined via underground methods. Surface infrastructure associated with the Mine and surrounding farmstead will be undermined. A risk assessment has been undertaken for the operations by a qualified rock engineer, and the relevant safety factors calculated.
National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA) and its Regulations	The NEMA, as amended was set in place in accordance with Section 24 of the Constitution. Section 24 (1)(a) and (b) of NEMA state that the potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity NEMA Regulations pertaining to the financial provision for prospecting, exploration, mining or production activities (GNR1147 –20 November 2015) (as amended).	The EIA Regulations identifies activities that require assessment due to their potential environmental impacts, and sets out the procedure for the EIA process. The application for environmental authorisation has been undertaken in terms of the provisions of NEMA. The Quantum for Financial Provision is, and will continue, to be assessed and updated on an annual basis.
National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) and its Regulations.	Regulations to the NEMWA identifies a number of activities (Category A and B) which require a WML prior to being undertaken. Activities identified in Category C of the NEMWA Regulations (GN R 921) do not require a WML, but must comply with the relevant requirements or standards determined by the Minister. The Norms and Standards for Storage of Waste, published under Government Notice R.926 in Government Gazette 37088 of 29 November	Forzando Coal Mines (Pty) Ltd has an approved EMPr in terms of the MPRDA, as well as separate Environmental Authorisation (17/2/2/2 GS-04) for its mineral waste facilities. These are deemed to be approved in terms of NEMWA. Provisions of the Norms and Standards, and for responsible waste management as relevant to the Mine, have been included in this EMPr.

Title	Summary	Relevance to the Project
	2013 are relevant to the operations at Forzando North Coal Mine.	
National Water Act, 1998 (Act 36 of 1998) (NWA) and its Regulations.	The NWA is the principal Act regulating water use in South Africa, and places an obligation on the owner, occupier or person in control of land to mitigate against potential pollution of water resources, including the remediation of polluted water after closure. The Regulations on use of water for mining and related activities aimed at the protection of water resources promulgated in terms of the NWA (GN704) contains specific regulations for rehabilitation of coal residue deposits, which state that any person who establishes a coal residue deposit must rehabilitate the residue deposit to ensure compaction thereof (to prevent spontaneous combustion and minimise the infiltration of water) and to ensure that rehabilitation is implemented concurrently with the mining operation. There are two mine residue facilities remaining at Forzando North.	Forzando Coal Mines (Pty) Ltd has an approved Water Use License (WUL) (License number: 04/B11A/BCGIJ/1664)) which authorises the following water uses at the Mine: • Section 21 (b): Storage of water; • Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse; • Section 21 (g): Disposing of waste in a manner that could detrimentally impacts on a water resource; and • Section 21 (j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people. In addition to the above, Forzando Coal Mines (Pty) Ltd has a separate authorisation (31/177/96) for the abstraction of water from the Usuthu-Vaal Government Water Scheme. Additional water uses will be associated with the Project, as such it is anticipated that a new application will be submitted to the Department of Water and Sanitation (DWS) in due course.
National Environmental Management Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA) and its Regulations.	Activities that are identified in GN 983 require an Atmospheric Emissions License (AEL). The NEMAQA further establishes National Ambient Air Quality Standards (NAAQS) (GN R 1210 of 2009) which provide the goals for air quality management plans and also provide the benchmarks by which the effectiveness of these management plans are measured.	No listed activities are associated with Forzando North Coal Mine and an AEL is not required for the operations. Specific requirements for prevention and management of dust and emissions potentially arising from the Mine, and monitoring and reporting requirements in terms of air quality, are incorporated into this EMPr.

Title	Summary	Relevance to the Project
	GN1123 declared the Highveld Priority Area (HPA) in terms of the NEMAQA. The HPA Air Quality Management Plan (AQMP) was published in GN144. Regulation 3 of the National Dust Regulations set out a dust fall standard for residential and non-residential areas, which may not be exceeded more than twice per year or in two consecutive months. Mines are identified in Annexure 1 of the National Atmospheric Emission Reporting Regulations, 2015 and must report annually via the National Atmospheric Emissions Inventory System (NAEIS). Furthermore, coal mines are identified as a Category A Data Provider in terms of the National Greenhouse Gas Emissions Reporting Regulations, 2017 (Notice 275 of 2017), and identified in Annexure 1 as an activity for which greenhouse gas (GHG) Emissions must be reported annually via the South African Greenhouse Gas Emissions Reporting System (SAGERS).	
National Environmental Management Protected Areas Act, 2003 (Act No 57 of 2003) (NEMPAA)	The Act provides for the protection and conservation of ecologically viable areas of South Africa's biological diversity, natural landscapes and seascapes. It further provides for the establishment of a register of protected areas (SAPAD).	There are no formally protected areas in the immediate vicinity of the Mine. The nearest protected area is the Rietvlei Private Nature Reserve situated ~30 km south-east of the Mining Right Area (MRA) and the Heyns Private Nature Reserve situated ~31.5 km north-west of the MRA.
National Protected Areas Expansion Strategy (NPAES), 2008	The goal of the NPAES is to achieve cost effective protected area expansion, thus enabling better ecosystem representation, ecological sustainability, and resilience to climate change. A comprehensive set of priority areas was compiled based on the priorities identified by provincial and other agencies in their respective protected area expansion strategies. These	The MRA overlaps with priority focus areas for expansion according to the 2018 NPAES dataset. It is noted that these areas are earmarked for underground mining and no surface activities are proposed in these areas.

Title	Summary	Relevance to the Project
	focus areas are generally large, intact and unfragmented and are, therefore, of high importance for biodiversity, climate resilience and freshwater protection.	
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) and its Regulations.	Provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. The Act relates to the protection of species and ecosystems that warrant national protection, among others.	Certain Fauna and Flora Species of Conservation Concern (SCC) are expected to occur on site. The protected plant species that cannot be avoided by the construction of the proposed infrastructure, will have to be translocated under the necessary permits.
National Forests Act, 1998 (Act 84 of 1998)	Allows for the protection of certain tree species	No Listed Tree species were identified on site.
Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA)	Provides for control over the utilisation of the natural agricultural resources of the Republic to promote the conservation of soil, water sources and vegetation and the combating of weeds and invader plants.	Due to extensive mining, agriculture and other ecological disturbance in the wider region alien invasive species are considered a threat to the biological diversity of surrounding areas. Alien invasive management has been incorporated into this EMPr.
Subdivision of Agricultural Land Act, 1970 (Act 70 of 1970)	The Act controls the subdivision and use of agricultural land. Land with high-value agricultural potential should be protected and not sub-divided or fragmented into smaller portions that would threaten the viability of agricultural activities.	No subdivisions are proposed. The proposed ventilation shafts will likely affect 5000m^2 of agricultural land, it is not anticipated that this will threaten the viability of existing agricultural activities on the Site.
National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)	The Act aims to promote good management and preservation of the country's Heritage Resources.	Heritage resources have been identified on site. It is anticipated that these can be preserved *in-situ* as they will not be directly affected by any surface infrastructure.
Provincial and Local Legislation and guidelines	Mpumalanga Tourism and Parks Agency Act (Act 5 of 2005), the Mpumalanga Nature Conservation Act (Act No. 10 of 1998), Mpumalanga Spatial Development Framework (SDF) (MPSDF, 2018)	The Mpumalanga Tourism and Parks Agency (MTPA) were consulted as part of the Public Participation Process (PPP) for the Bankpan and Killowen project

Title	Summary	Relevance to the Project
		The MPSDF identifies the area as a mining area, although agricultural activity is also common. Management measures to protect natural fauna and flora in line with the Act have been included in the EMPr where relevant.
Noise Control Regulations in terms of the Environmental Conservation Act, 1989 (Act No 73 of 1989) (ECA) Municipal By-Laws: Noise	National and Local legislation governing the generation of noise or the undertaking of noisy activities, and the setting of acceptable noise limits in certain districts or types of areas.	Noise impact of the mining and processing operations have been assessed (E.A.R, 2023) and relevant measures to ensure noise impacts are managed adequately have been included in this EMPr.
Spatial Planning and Land Use Management Act, 2013 (Act No. 16 of 2013) (SPLUMA)	SPLUMA aims to develop a framework to govern planning permissions and the lawful use of land.	Forzando Coal Mines (Pty) Ltd must ensure that the infrastructure area is correctly zoned. No change in land use in anticipated for the vast majority of the MRA to be undermined.
Restitution of Land Rights Act, 1994, the Land Reform (Labour Tenants) Act, 1996 and the Extension of Security of Tenure Act, 1997	These Acts are aimed at land restitution and addressing injustices of the past by allowing for land claims and land reform.	Consultation with the Land Claims Commissioner has been initiated. To date no response has been forthcoming. If it is confirmed that there are land claims on the affected properties, the Applicant will consult with the land claimants. Land on which the project infrastructure is proposed is privately owned and the Project should not directly affect labour tenants.
Local Government Municipal Systems Act, 2000 (Act No. 32 of 2000) as amended	The Act requires local government to compile an SDF, including guidelines for land use management. Additionally, Municipalities are required to develop Integrated Development Plans (IDPs).	The relevant Municipal SDFs and IDPs have been considered where relevant and will further inform the S&LP projects.
Development Facilitation Act, 1995 (Act No. 67 of 1995)	The Act promotes the integration of the social, economic, institutional and physical aspects of land development and also promotes integrated land	Currently one hundred and seventy one (171) people are permanently employed at Forzando North. The proposed Project is not expected to contribute to job creation, but rather focus on the retention of jobs by prolonging the remaining LoM.

Title	Summary	Relevance to the Project
	development in rural and urban areas in support of each other. The Act encourages the availability of residential and employment opportunities in close proximity to or integrated with each other, while optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities.	Should any new positions become available in the future, these will be advertised locally, to ensure that the communities that are most affected also benefit the most from the Project.
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHSA)	The OHSA provides for the health and safety of persons at work and other persons who may be exposed to hazards associated with a workplace, including the use of plant and machinery.	Forzando Coal Mines (Pty) ltd must ensure compliance to the OHSA for the LoM.
National Road Traffic Act, Act No. 93 of 1996 (NRTA) and National Land Transport Act, Act No. 5 of 2008 (NLTA).	These Acts relate specifically to the planning and development of transport systems and the safe use of roads.	Additional traffic will be generated during the construction phase as equipment and machinery is brought onto site for the development of the new plant and ventilation shafts. However this is expected to be limited to ~40 trips. Once construction is complete the traffic levels are anticipated to revert to the current low intensity levels. The majority of the product is for export market, which is railed to the Richard Bay Coal Terminal.
Hazardous Substances Act, 1973 (Act No 15 of 1973)	The Act provides for the control of hazardous substances (sub-divided into four groups) defined as any substance that by their nature are toxic, corrosive, irritant, flammable, sensitising or pressure generating, which may cause ill-health, injury or death in humans.	Minimum requirements for hazardous substances associated with the Mine are incorporated into this EMPr and will be fully implemented on site.
The Explosives Act ,1956 (as amended)	The Explosives Act relates to the manufacture, storage, sale, transport, import, export and use of explosives.	The Project will be mined via mechanised underground methods, blasting will only be required in stone works (i.e. mining through dykes and faults). As such there are no surface influences pertaining to air blast and fly rock. Similarly to the existing operations, blasting is expected to be small with

Title	Summary	Relevance to the Project
		insignificant or no influence on surface. No specific impact is expected regarding ground vibration on the surface areas (Blast Management & Consulting, 2019). Explosives will be handled and stored in accordance with the Explosives Act and MHSA. The existing Magazine located at Forzando North will continue to be utilised for the LoM.
NEMA Guidelines	Various Guidelines on different aspects of integrated environmental management have been published by the Department of Environmental Affairs (currently the Department of Forestry, Fisheries and Environment, DFFE). These include (but are not limited to): The Integrated Environmental Management (IEM) Information Series; Public Participation Guideline (2017); Guideline on Need and Desirability (2017).	Relevant guidelines have been considered throughout the application process and the compilation of the associated reports.

4 PROJECT LOCATION

4.1 Regional and Local Setting

The project area is situated in Mpumalanga, 15 kilometres northeast of Bethal, 20 kilometres east of Ga-Nala (Kriel) and 25km southwest of Hendrina, see Plan 1 - Plan 3.

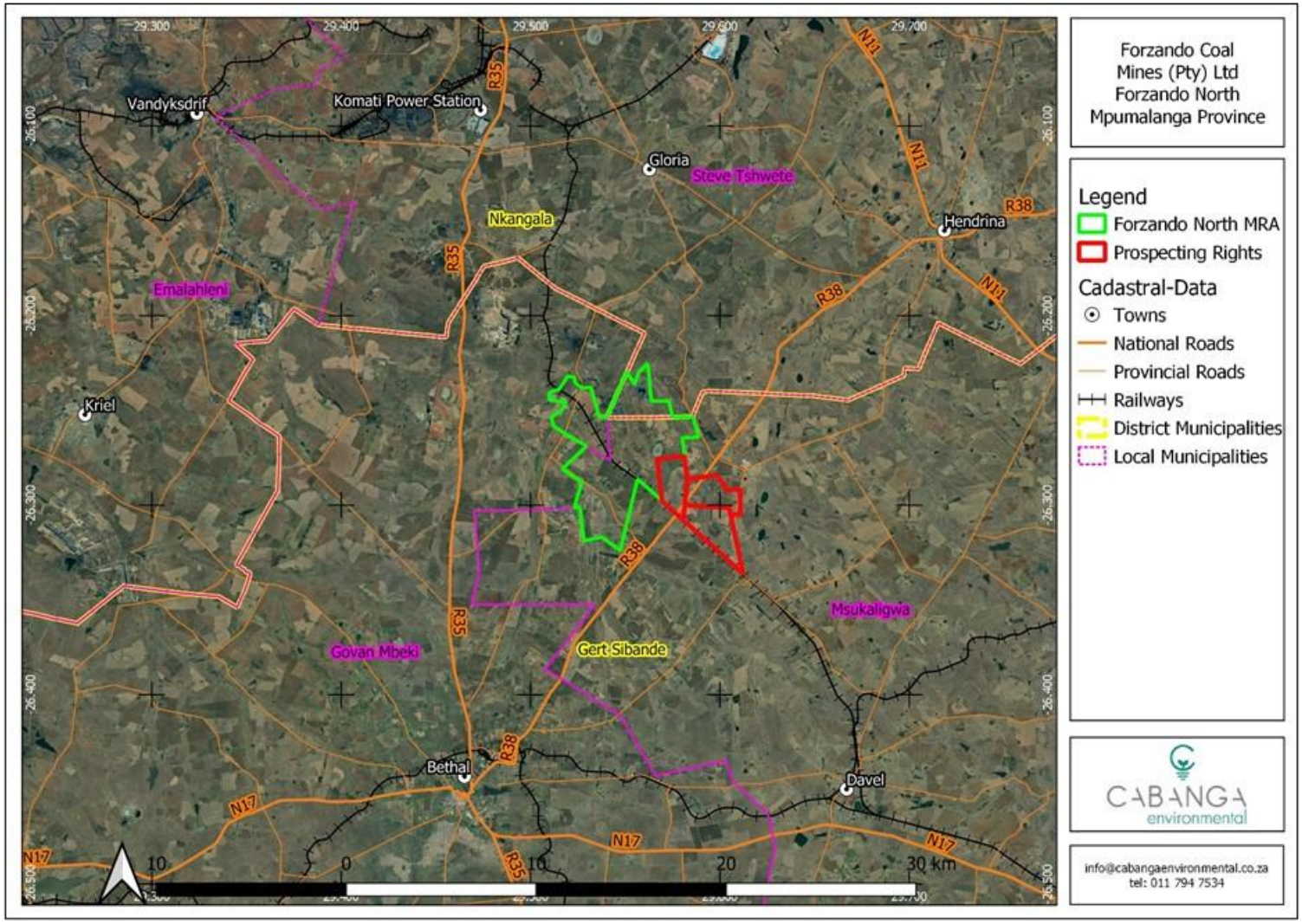
The annexation area falls within the Gert Sibande District Municipality (DC30), specifically Ward 10 of the Msukaligwa Local Municipality (MP302). Whist the Mine's Adit and infrastructure is located within the Govan Mbeki (MP307) and Steve Tshwete Local Municipalities (MP313).

4.2 Property Description

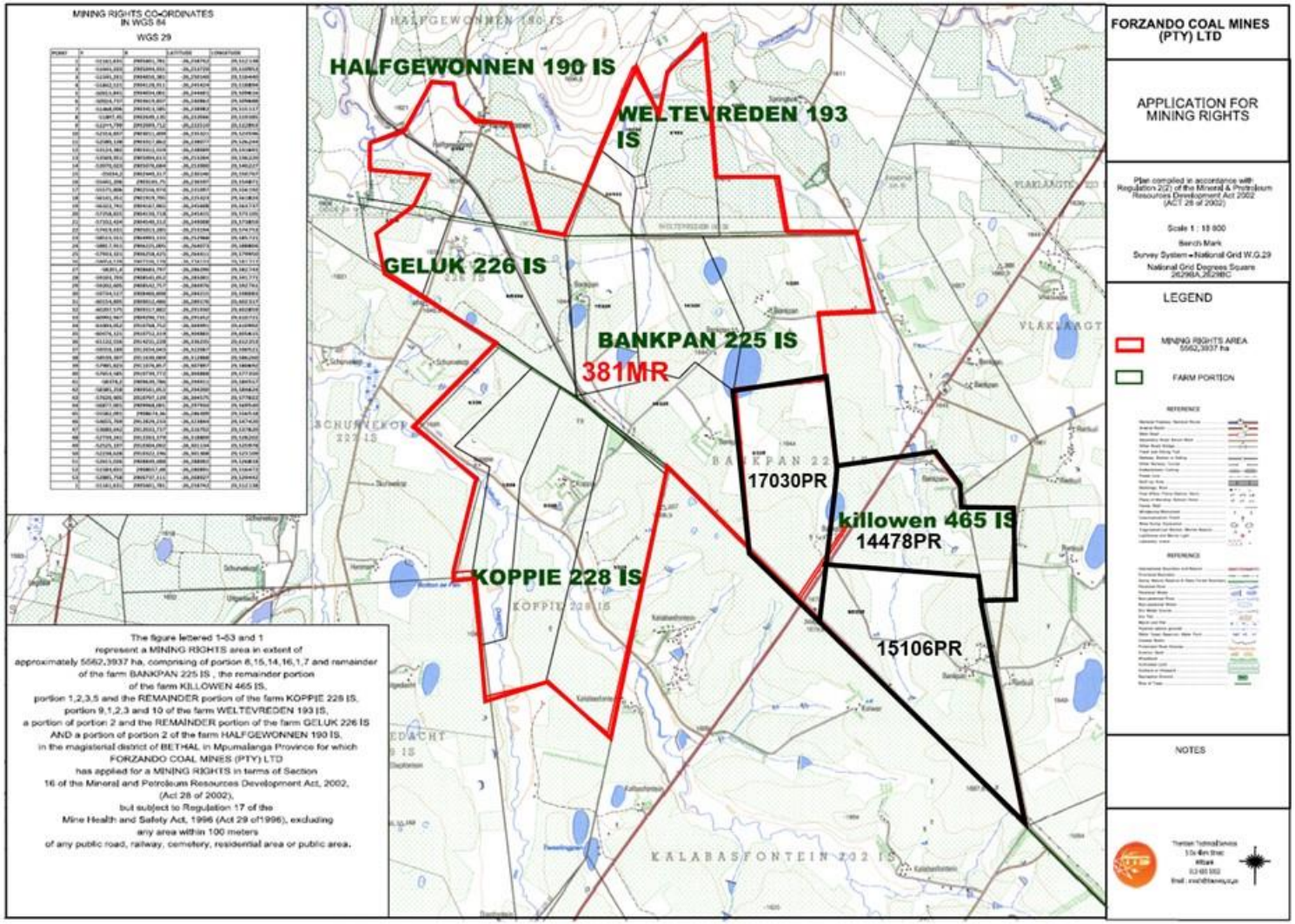
On approval of the Section 102 Application, to include 17030PR, 15106PR & 14478PR into the Forzando North Mining Right (381MR), the total extent of the MRA will be 5 562.3937 Ha including various portions of the farms Bankpan 225 IS, Koppie 228 IS, Weltevreden 193 IS, Geluk 226 IS, Halfgewonnen 190 IS and Killowen 465 IS (see Table 5 overleaf for details).

The operations will also affect Portions 1 and 5 of Halfgewonnen 190 IS, where some of the mine infrastructure is located and Portions 1, 2 and 14 of the farm Bankpan 225 IS – where two new ventilation shafts are proposed.

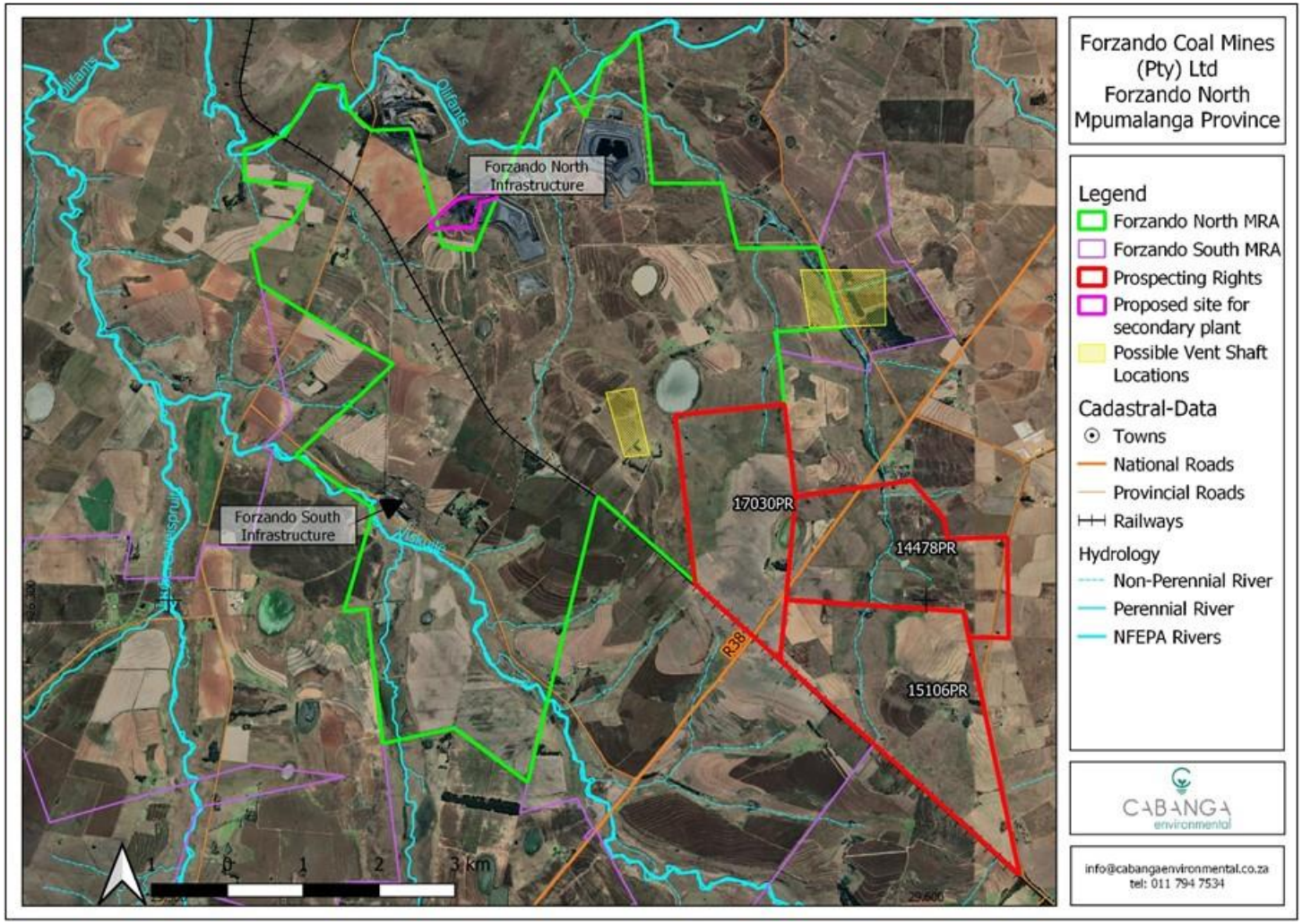
The new processing plant, and associated stockpile expansion, will be located adjacent to the existing plant.



Plan 1: Regional Setting



Plan 2: Regulation 2(2) Plan (Forzando Coal Mines (Pty) Ltd, 2023)



Plan 3: Local Setting showing the proposed position of the ventilation shafts and processing plant in relation to the existing infrastructure and Mining Right Areas

Table 5: Property details

Application area (Ha)	Prospecting Right Areas to be annexed: 1 482.6600 Ha Existing Mining Right Area: 4 079.7337 Ha Total Mining Right Area on approval of Section 102 Application: 5 562.3937 Ha				
Magisterial district:	Bethal				
Distance and direction from nearest town	15 kilometres northeast of Bethal, 20 kilometres east of Ga-Nala (Kriel) and 25km southwest of Hendrina				
Farm Name & Portions of the Mining Right Area[1]:	**Farm Name:**	**Portion:**	**SG Code:**	**Area (Ha)[2]:**	**DMRE Reference No.:**
	Killowen 465 IS	0 (RE)	TOIS00000000046500000	460.6600	MP30/5/1/2/2/14478PR
	Bankpan 225 IS	0 (RE)	TOIS00000000022500000	597.0000	MP30/5/1/2/2/15106PR
	Bankpan 225 IS	8	TOIS00000000022500008	425.0000	MP30/5/1/2/2/17030PR
	Bankpan 225 IS	RE 1	TOIS00000000022500001	430.3588	MP30/5/1/2/2/381MR
		7 (of 1)	TOIS00000000022500007	1.7131	
		RE 14	TOIS00000000022500014	338.5508	
		15 (of 14)	TOIS00000000022500015	244.1806	
		16 (of 14)	TOIS00000000022500016	320.4166	
	Koppie 228 IS	0 (RE)	TOIS00000000022800000	9.5618	

[1] Where the green highlighted cells indicate the areas to be annexed.

[2] Extent of the property included within the Mineral Right.

		RE 1	T0IS00000000022800001	281.9697	
		2	T0IS00000000022800002	453.3509	
		3 (Rechoboth)	T0IS00000000022800003	453.3424	
		5 (of 1)	T0IS00000000022800005	171.3727	
	Weltevreden 193 IS	1	T0IS00000000019300001	3.4261	
		3	T0IS00000000019300003	273.4535	
		Mineral area 2 (PTN of Mineral Area 1) on Portion 4	T0IS00000000019300004	85.0141	
		9 (of 2)	T0IS00000000019300009	90.0801	
		10 (of 2)	T0IS00000000019300010	93.2921	
	Geluk 226 IS	Mineral Area 1 on Portion 0 (RE)	T0IS00000000022600000	494.0817	
		Mineral Area 1 on Portion 2	T0IS00000000022600002		
	Halfgewonnen 190 IS	Mineral Area 3 on RE 2	T0IS00000000019000002	335.5687	
Farm Name & Portions of additional properties affected by surface infrastructure:	Halfgewonnen 190 IS	1	T0IS00000000019000001	Associated with the existing infrastructure area at Forzando North.	
	Halfgewonnen 190 IS	5	T0IS00000000019000005		
	Bankpan 225 IS	2	T0IS00000000022500002	Associated with the proposed ventilation shaft (East) and associated service routes, power supply and distribution.	

5 PROJECT DESCRIPTION

5.1 Existing and Proposed Infrastructure

The existing infrastructure at Forzando North can be summarised as follows:

- Haul/access roads and parking;
- Security, fencing and access control;
- Workshop area incl. stores, hydrocarbon storage, and wash bays;
- Administrative complex incl. offices, clinic, change house, laundry and lamp rooms;
- Incline shaft;
- Ventilation shafts and fans;
- Soil and overburden stockpiles;
- Coal beneficiation plant(s);
- Water and slurry reticulation pumps and pipelines;
- Coal product load-out stockpile, located to the west of the discard dump;
- Run-of-mine (ROM) coal stockpiles;
- Metallurgical coal stockpiles;
- Coal discard dumps (No. 1, 2 and 3);
- Sewage Treatment Plant;
- Water Treatment plant;
- Clean and dirty water diversion drains;
- Pollution control dams (PCDs) x7;
- Erikson dam;
- Substation(s) and associated power lines;
- Salvage yard and waste storage area;
- Rail line of about 1,6 km to the Richards Bay Coal Terminal railway line;
- Rail loop of about 400 m diameter; and
- Burrow Pit.

Additional proposed infrastructure can be summarised as follows:

- Two new ventilation shafts;
- An additional processing plant and expanded stockpile area – to be located adjacent to the existing Forzando North processing plant; and
- Associated infrastructure:
    - access / haul roads;
    - electricity supply and distribution;
    - slurry and water reticulation pipelines.

These are further discussed in the sections that follow.

5.1.1 Access Roads & Transport

The Forzando North infrastructure area is accessed via an unpaved access road located off the D622 (also known as the Halfgewonnen Road). Internal vehicle movement at the operations is via a series of unpaved roads.

The proposed development of an additional processing plant will necessitate that internal haul roads, at the existing plant area, be extended by approximately 2km. The roads will have a maximum width of 8m.

Product coal will be temporarily stockpiled at the plant area before being conveyed to the rapid load terminal (RLT), located at the existing rail siding loop for export or loaded onto trucks for transport to local markets.

Service roads will be required for each of the proposed ventilation shafts. These roads will be unsurfaced "Jeep"' tracks of between 4-5m wide and a maximum of 2 km long, accessed from existing farm roads.

5.1.2 Security Fencing & Access Control

The Forzando North infrastructure area is fenced, and access to site is controlled via a security checkpoint. The proposed ventilation shafts will also be fenced for safety reasons. Fencing is specified at 2m high, diamond mesh with barbed wire.

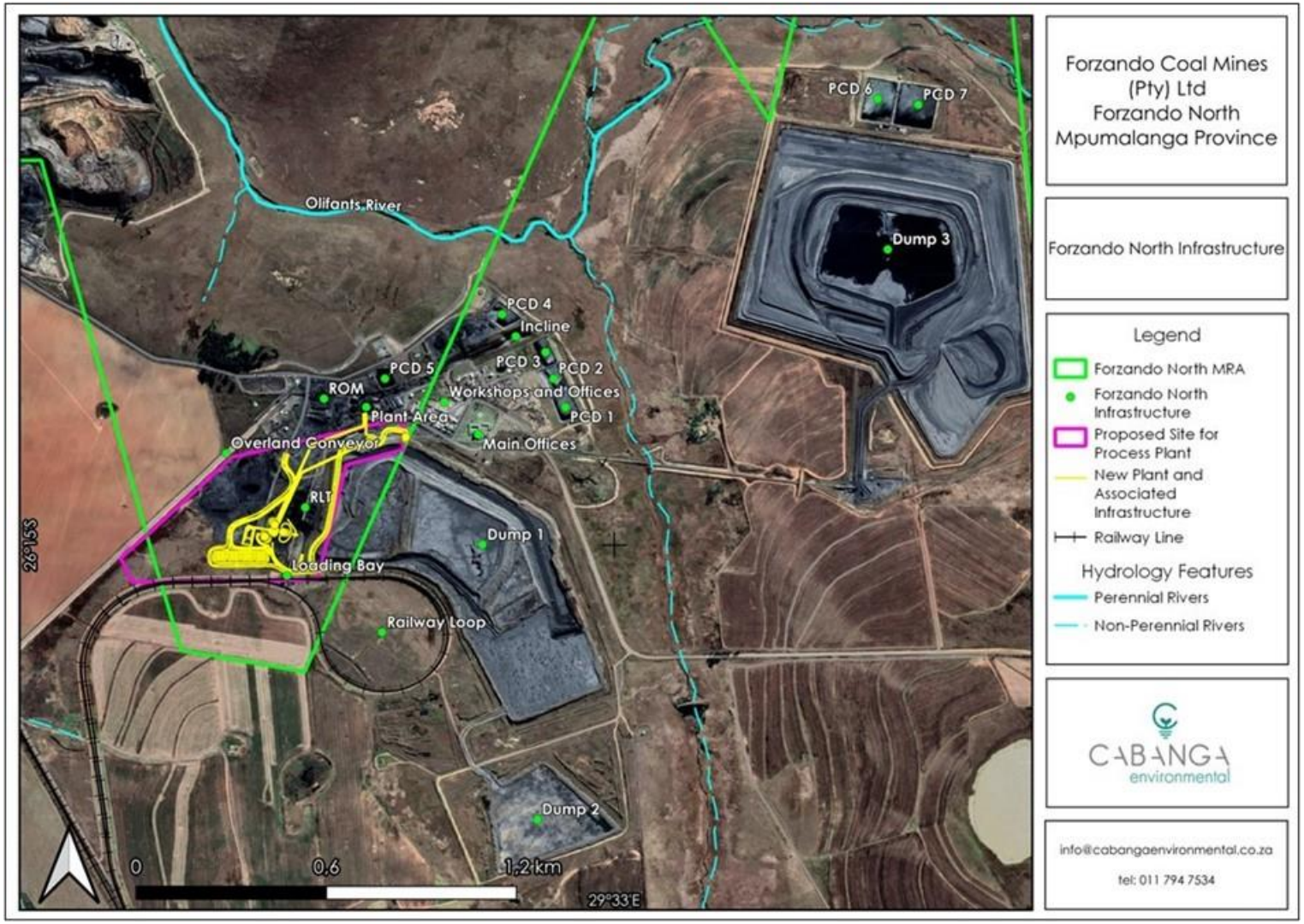
5.1.3 Administration, Workshops & Other Buildings

The existing administration complex and workshop area will continue to be utilised for the life of mine.

5.1.4 Storage of Dangerous Goods

Diesel storage facilities (3 x 20m^3 tanks) are located at the workshop area, and are appropriately bunded. No additional storage requirements are associated with the proposed Project.

Chemicals used at Forzando North are stored in designated areas, the appropriate Material Safety Data Sheets (MSDS) are kept on file.

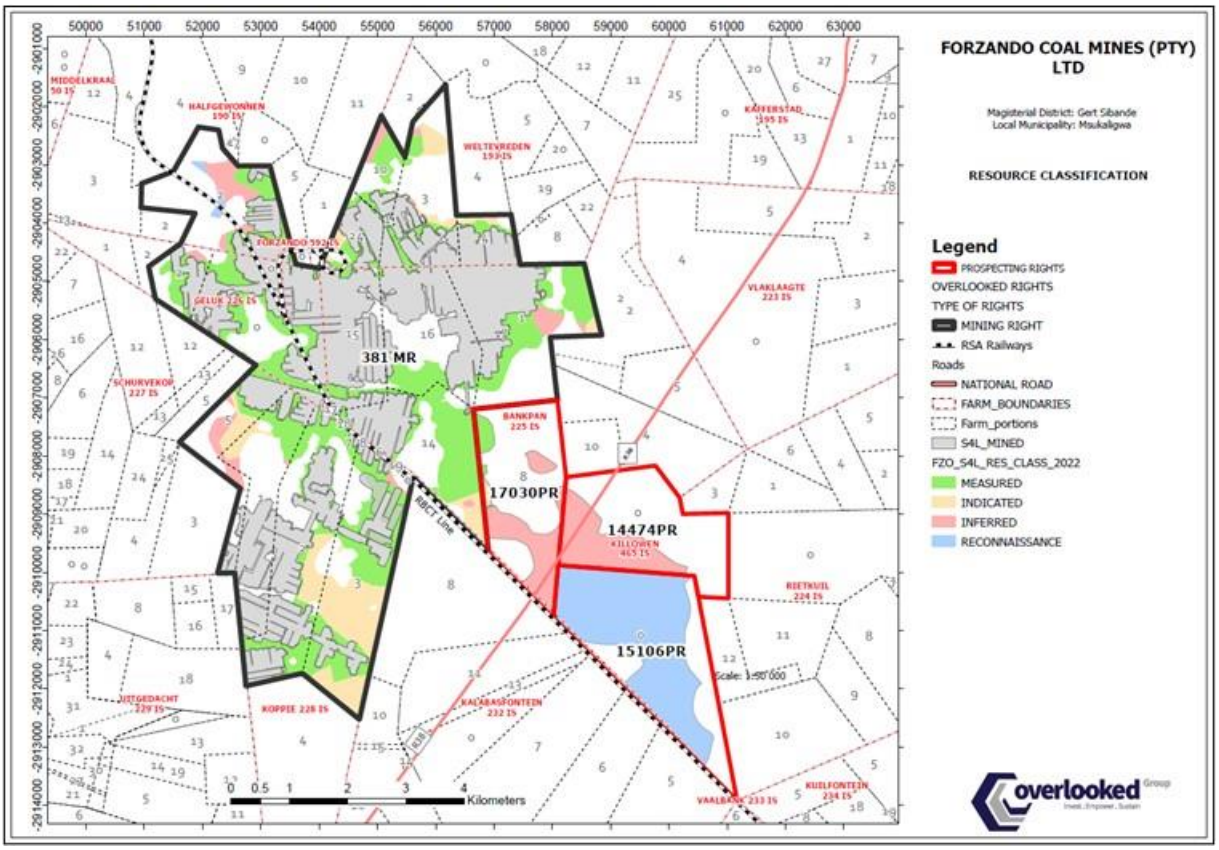


Plan 4: Overview of the Forzando North incline and infrastructure area

5.2 Mineral Reserve, Life of Mine (LoM) and Mine Plan

Seven main coal seams are recognised in the area, named, from base upwards as S1L, S1, S2, S2Leader, S4, S5 and S6 (Forzando Coal Mines (Pty) Ltd, 2023). However, only the S2 and S4 seams are of economic interest. To the south the S2 is not well developed due to dolerite intrusions and thus only the S4 will be targeted for extraction in the Project area annexation.

Through an intensive drilling exercise on the Prospecting Right areas, economically viable blocks of coal have been defined (Plan 5). The Applicant plans to mine these newly defined blocks of coal via underground methods, accessing them from the existing Forzando North workings (refer to Figure 1).



Plan 5: Resource Classification (Forzando Coal Mines (Pty) Ltd, 2023)

The reserves will be mined using a mechanised bord-and-pillar method using continuous miners. In mechanised bord-and-pillar mining, extraction is achieved by developing a series of roadways (bords) in the coal seam and connecting them by splits (cut-through) to form pillars. These pillars are left behind as part of a primary roof support system. The reserves will be mined using a mechanised bord-and-pillar method using continuous miners. In mechanised bord-and-pillar mining, extraction is achieved by developing a series of roadways (bords) in the coal seam and connecting them by splits (cut-through) to form pillars. These pillars are left behind as part of a primary roof support system. To maintain pillar stability the following parameters have been recommended (M.Mazibuko, 2023):

- Minimum pillar centres: 16.0m x 16.0m increasing up to 24.0m x 24.0m as dictated by the depth to the floor of the No. 4-lower seam. The resultant safety factors are indicated in the Rock Engineer's Report attached as Appendix F 12 of the BAR;
- Maximum bord width: 6.8m;
- Maximum width-to-height ratio: 2.5;
- More stringent parameters to be applied when undermining sensitive infrastructure, such as farm houses, streams and pans; and
- Areas intersected by dolerite dykes will be mined according to specific recommendations issued by the rock engineer (M.Mazibuko, 2023).

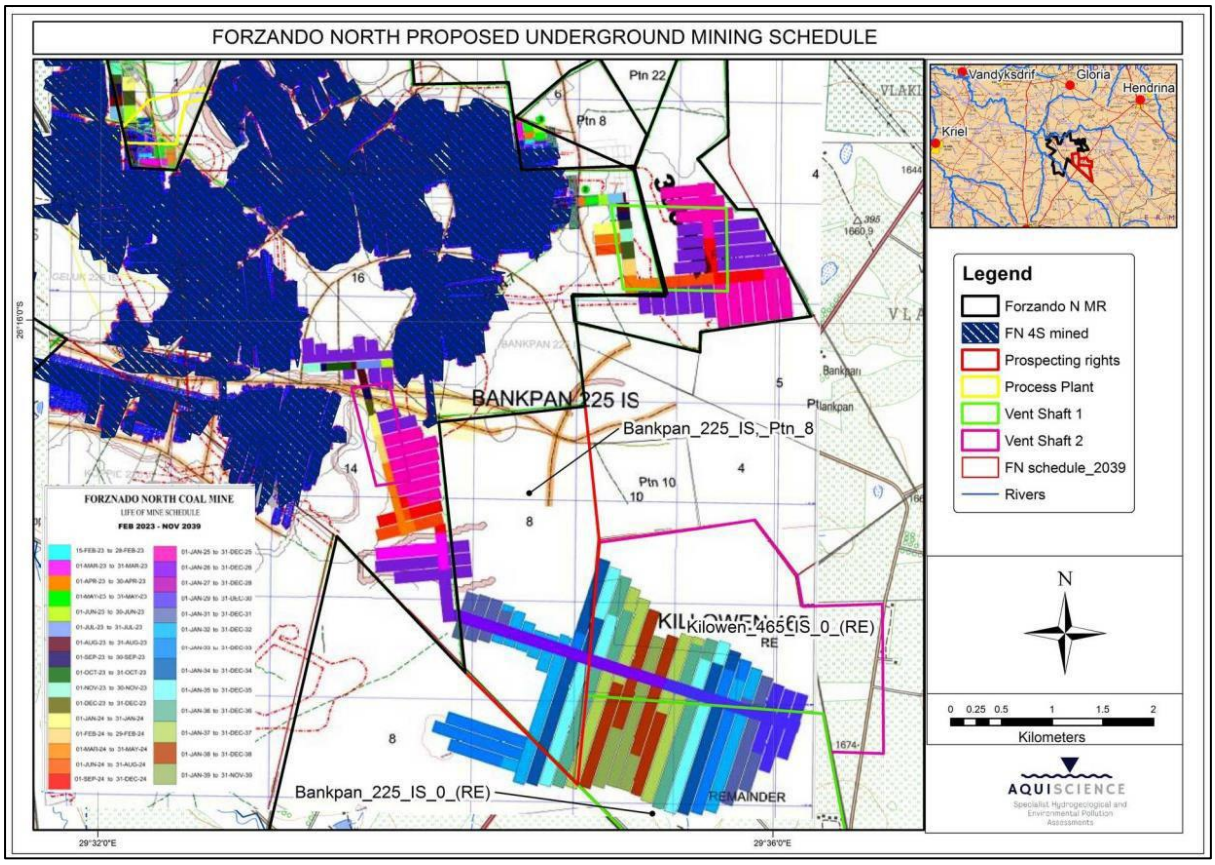


Figure 1: LoM showing the proposed underground workings (Aquiscience, 2023)

The Project area annexation is intended to assist Forzando North to maintain its production levels of approximately 1.0Mt per annum up until 2038 before decreasing to ~0.5Mt in the last year of its LoM in 2039 (Forzando Coal Mines (Pty) Ltd, 2023).

Figure 2 overleaf highlights the production profile over the LoM. Three sections, Sections 1, 2 and 3, are currently in operation at Forzando North. However, only two sections, Sections 1 and 3 are scheduled to be relocated to the Project area (2029) once the reserves at Forzando North are depleted (2028).

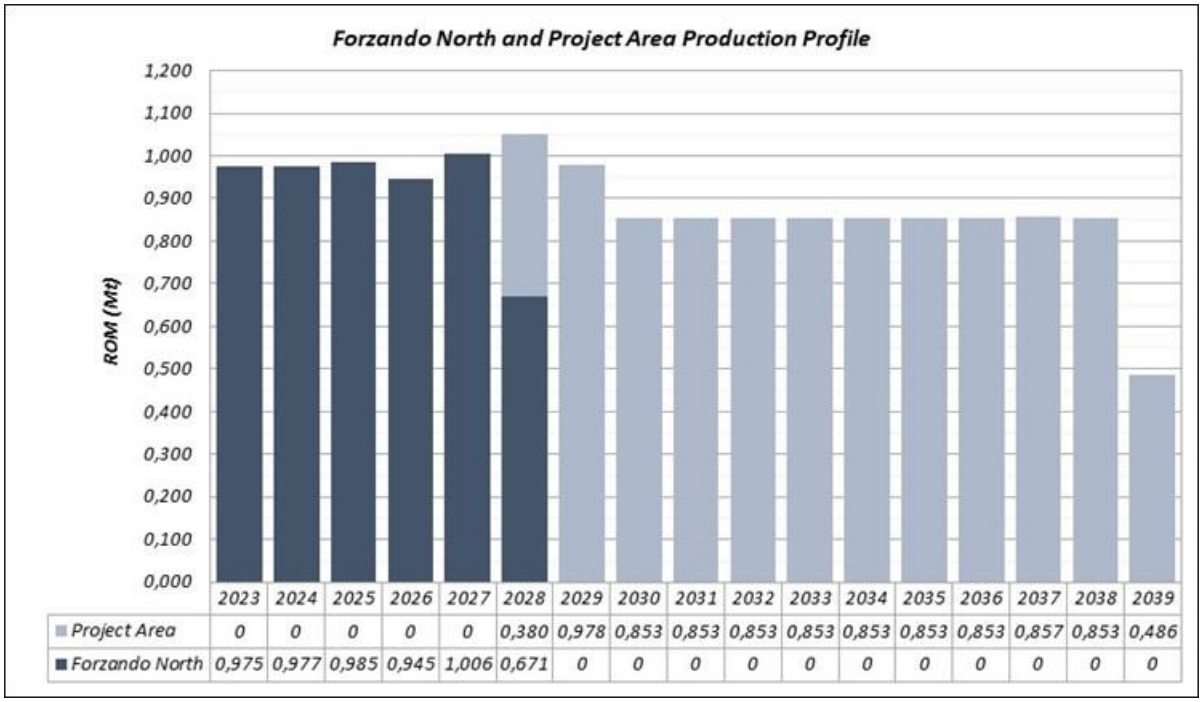


Figure 2: LoM Production Profile (Forzando Coal Mines (Pty) Ltd, 2023)

5.3 Ventilation Shafts

Two additional ventilation shafts are proposed, these ventilation shafts will be circular, vertical shafts that will be raise bored: A pilot hole will be drilled into the underground workings, a reamer head will then be attached to the drill rods, rotated and reamed back up as illustrated in Figure 3 below. Drill chips (rock) will be handled underground. A sump will be required on surface to circulate water during the drilling process. A surface area of 2,500m^2 will be impacted on by each ventilation shaft, although a much larger area has been assessed to allow for micro-siting (Plan 6). Once bored, each ventilation shaft will be fitted with ducting and a ventilation fan. Figure 4 illustrates a typical ventilation shaft and fan.

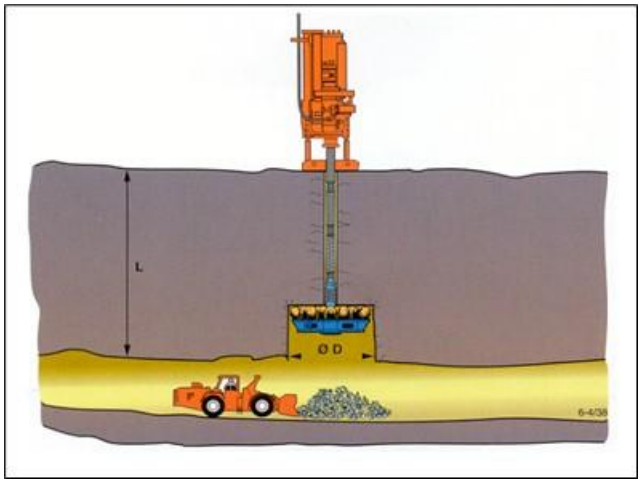
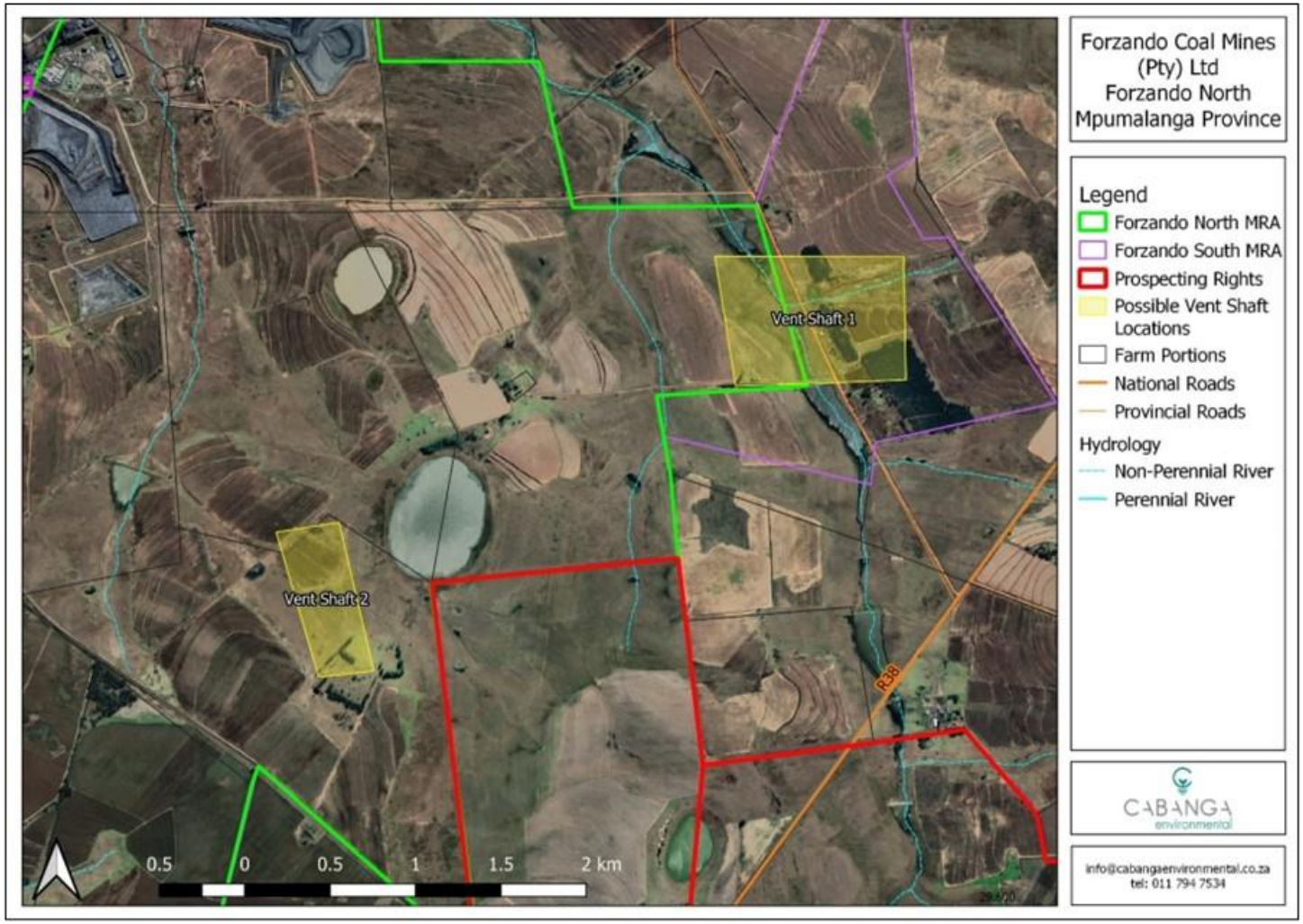


Figure 3: Illustration of raise boring by typical up-reaming (P.H.Ferreira, Unknown)



Plan 6: Location of proposed Ventilation Shafts

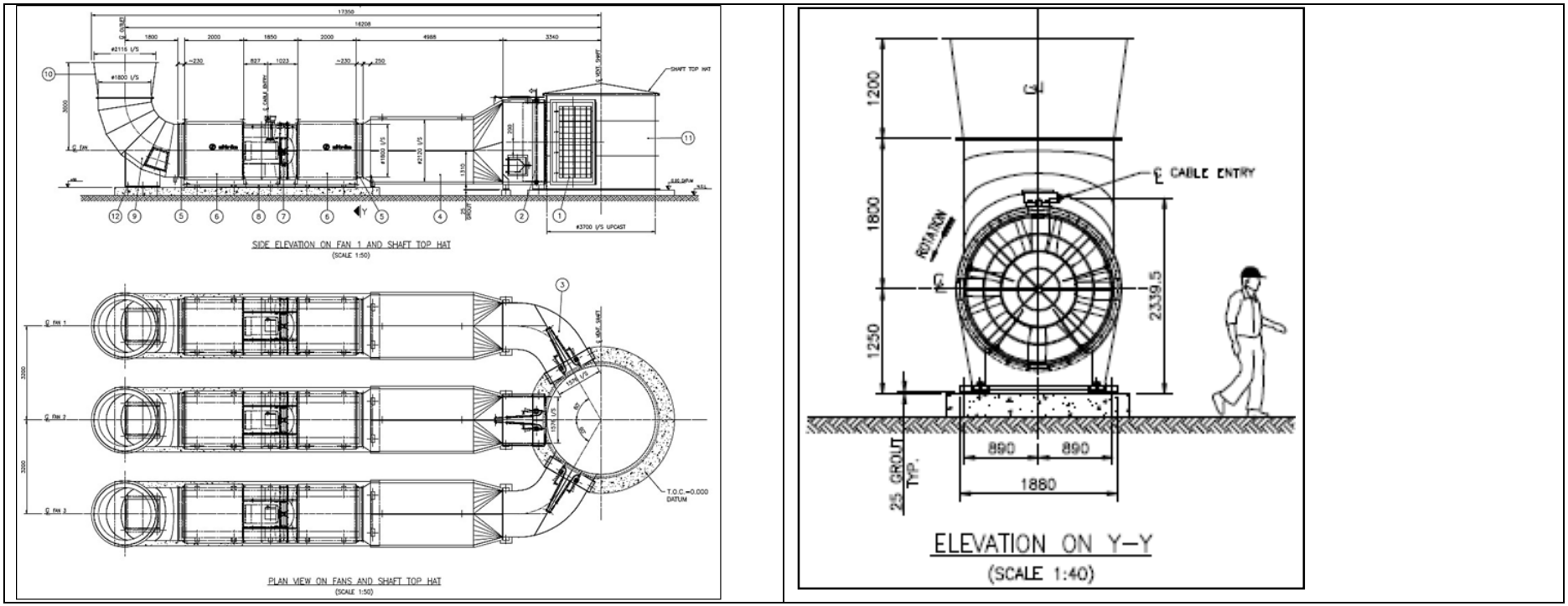


Figure 4: Typical ventilation shaft and fan[3]

[3] For illustrative purposes only.

5.4 Coal Handling and Processing

This section is extracted directly from the Mining Works Programme (Forzando Coal Mines (Pty) Ltd, 2023).

Existing Processing Plant:

The Forzando North plant is designed to beneficiate RoM from both the Forzando North and South operations. Coal is conveyed from the inclines to the RoM stockpile area where it is temporarily stockpiled prior to processing.

The existing plant consists of two modular streams, namely the Blue and Brown Plants (Figure 6 - Figure 7) with a combined designed capacity to beneficiate approximately 4.1Mt of ROM per annum.

Live capacity of the stockpile is 20,000 tonnes while the emergency stockpile can stack 40,000 tonnes. ROM stockpile is fed to the Bivitech screen via a stockpile withdrawal conveyor. The Bivitech screen is a double deck screen, where undersize from the screen reports to Blue Plant product belt and the oversize reports to the secondary crusher. Coal is reduced to a 50mm top size in a closed-circuit operation. Crushed material then reports to Dense Medium Plant feed bins (Figure 8) and Spiral Plant for further processing. Capacity of the crushing plant circuit is approximately 500tph.

Discard arising from the two modules reports to discard conveyor and it is discharged into the waste load out bin for trucking to the co-disposal discard dump (Dump 3). Slurry from the thickener is also pumped to the co-disposal dump. Water from the co-disposal dump reports back to the dams and it is re-used in the plant as process water.

Coal from the product stockpiles is conveyed to Rapid Loading Terminal (RLT) silo. Train wagons loaded are positioned under the loading flask. A flask weighs the coal for each wagon, with the discharge from the flask being controlled by means of a gate and a profile chute. The trains received at the load-out terminal consist 100 wagons which are loaded to a total capacity of 8,400 tonnes per train. The facility has the capacity to load 104 wagons as and when it is required by Transnet Freight Rail (TFR).

All existing surface infrastructure will be retained to service production from Forzando North, inclusive of the Project annexation area, with an additional processing plant proposed.

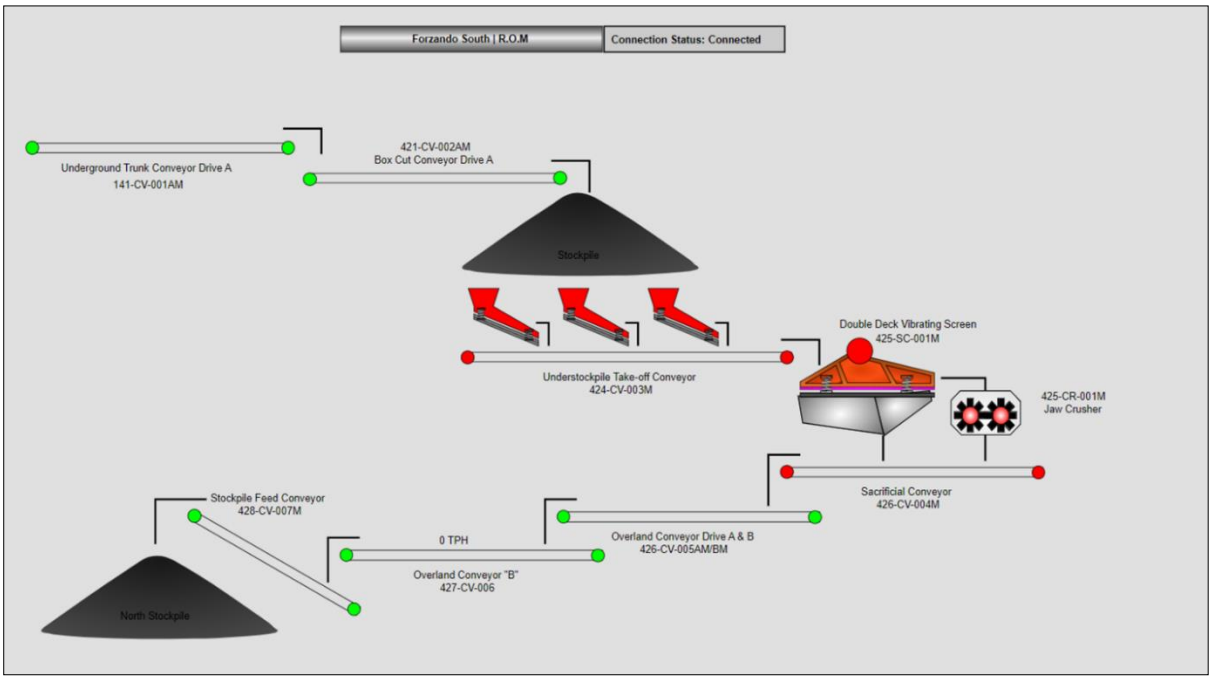


Figure 5: Forzando South ROM Coal Flow Diagram (Forzando Coal Mines (Pty) Ltd, 2023)

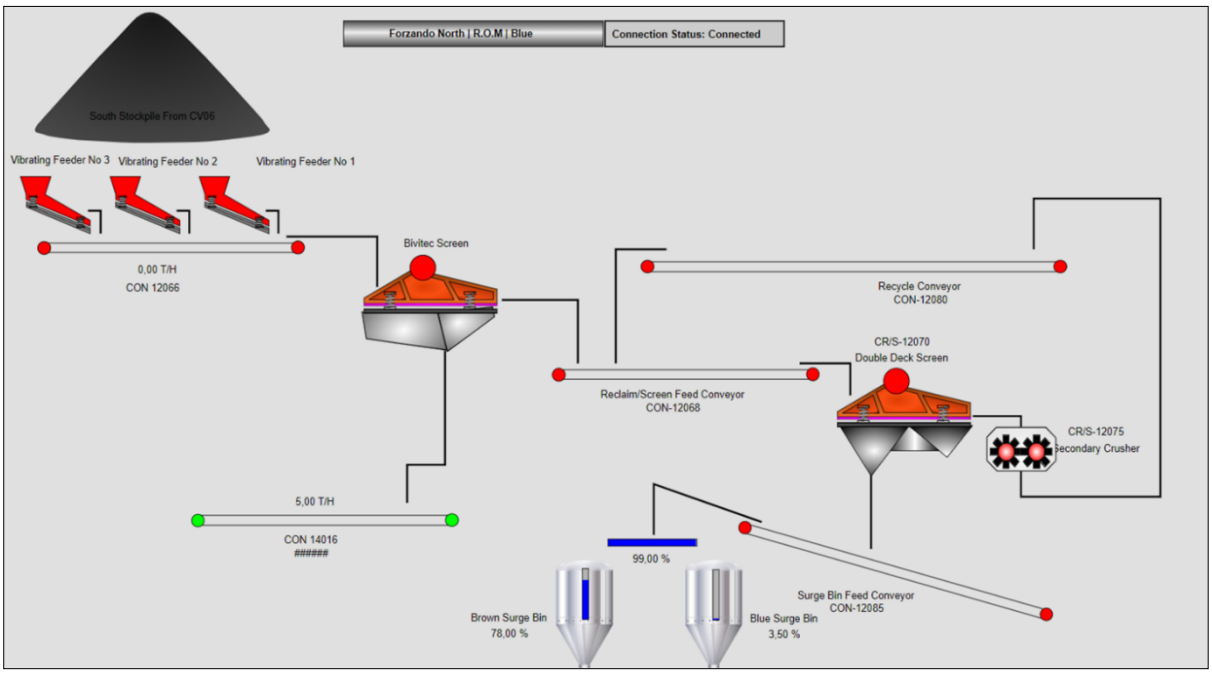


Figure 6: Blue Plant ROM Coal Flow Diagram (Forzando Coal Mines (Pty) Ltd, 2023)

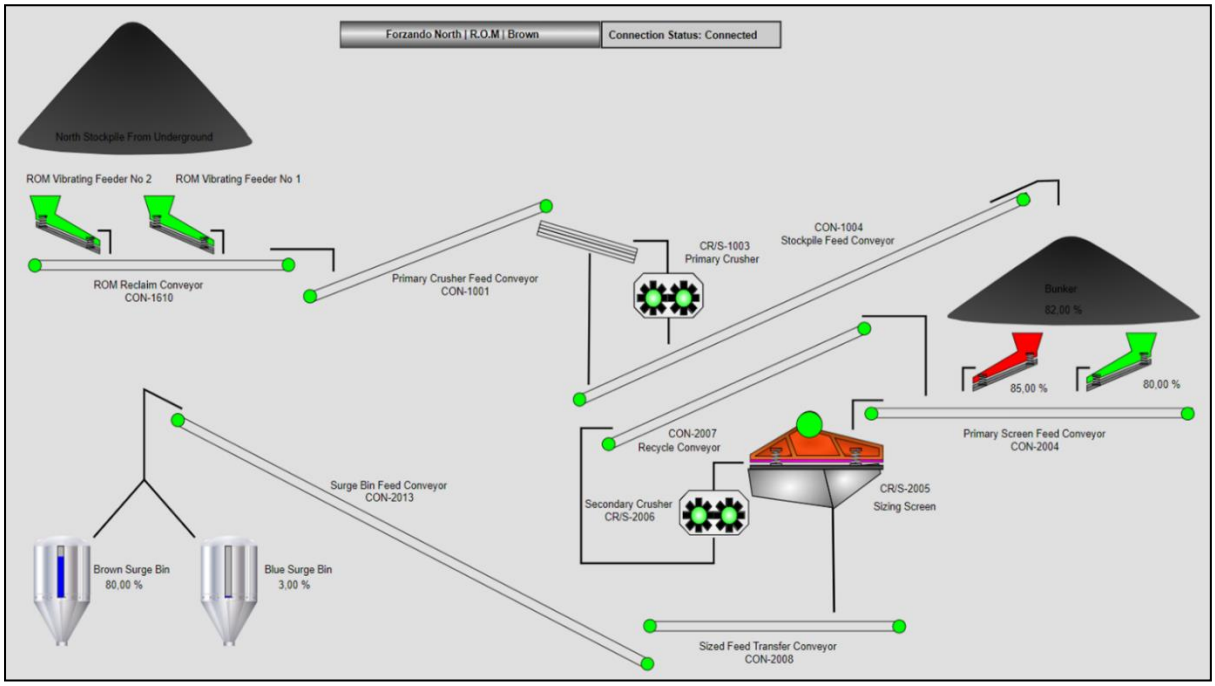


Figure 7: Brown Plant ROM Coal Flow Diagram (Forzando Coal Mines (Pty) Ltd, 2023)

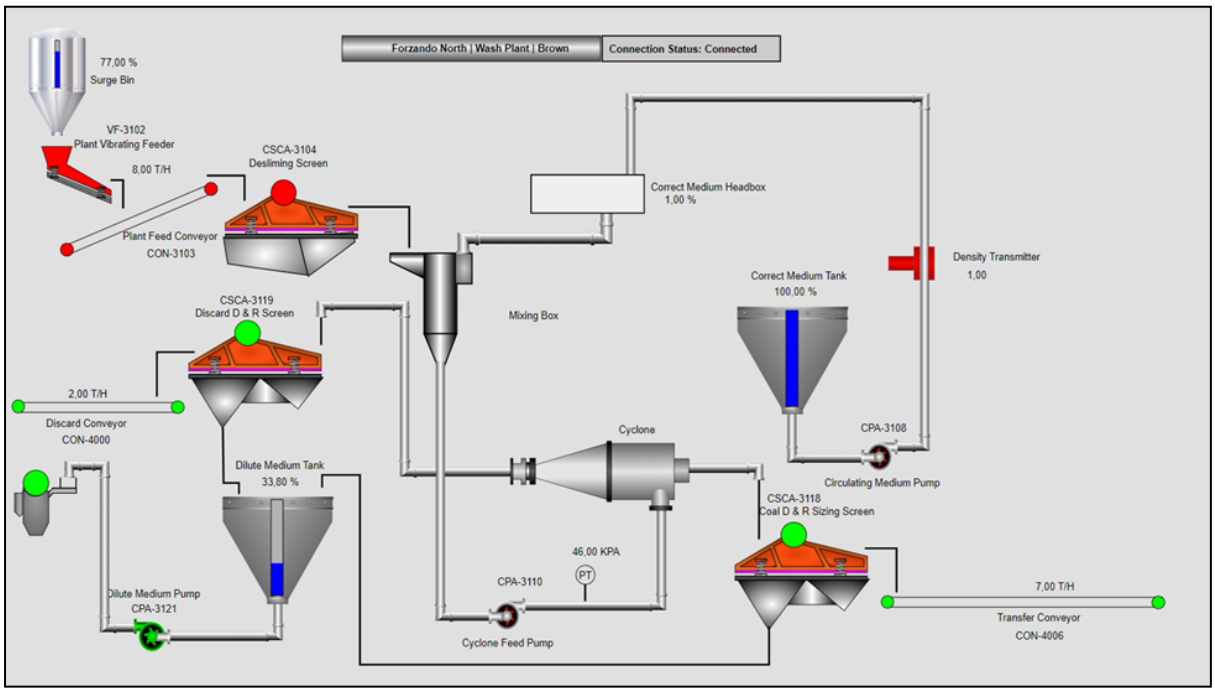


Figure 8: DMS Flow Diagram (Forzando Coal Mines (Pty) Ltd, 2023)

<u>Proposed Processing Plant:</u>

The proposed processing plant will be located at the existing Forzando North infrastructure area (Plan 7) and will consist of a RoM section for crushing and bypass system; and a single dense medium circuit. The RoM section will operate at 350t while the dense medium separator

(DMS) and bypass section will operate at 220t/h and 130t/h. The total designed capacity of the plant will be 2.2Mt of RoM per annum.

Live capacity of the RoM stockpile will be 24, 000 tonnes with an emergency stockpile area of 8,000 tonnes. The RoM stockpile will be fed to the primary sizer and the undersize of the crusher will be fed to the vibrating screen feeder where the oversize will be crushed to 50mm and the undersize will form a bed for the secondary crusher. Both products will be fed to a bin at 350t/h. The feed from the RoM bin will be split into two, fed to DMS at 220t/h and RoM bypass at 130t/h.

The DMS consists of the following equipment: screens, two product cyclones, classifying cyclones, spirals and conveyors. The primary product will be stockpiled on a radial stockpile destined for export market through the Rapid Load Out Terminal (RLT) silo while the secondary product will be stockpile on a conical stockpile to be sold locally

The discard arising from the 220t/h module will be conveyed to the co-disposal dump (dump No. 3). Slurry from the thickener will also be pumped to the co-disposal dump.

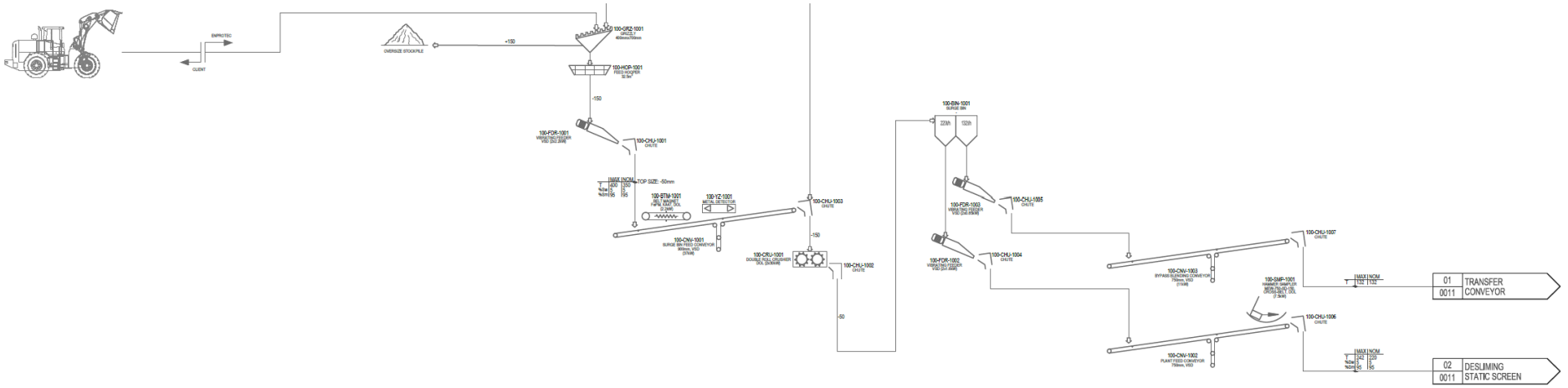
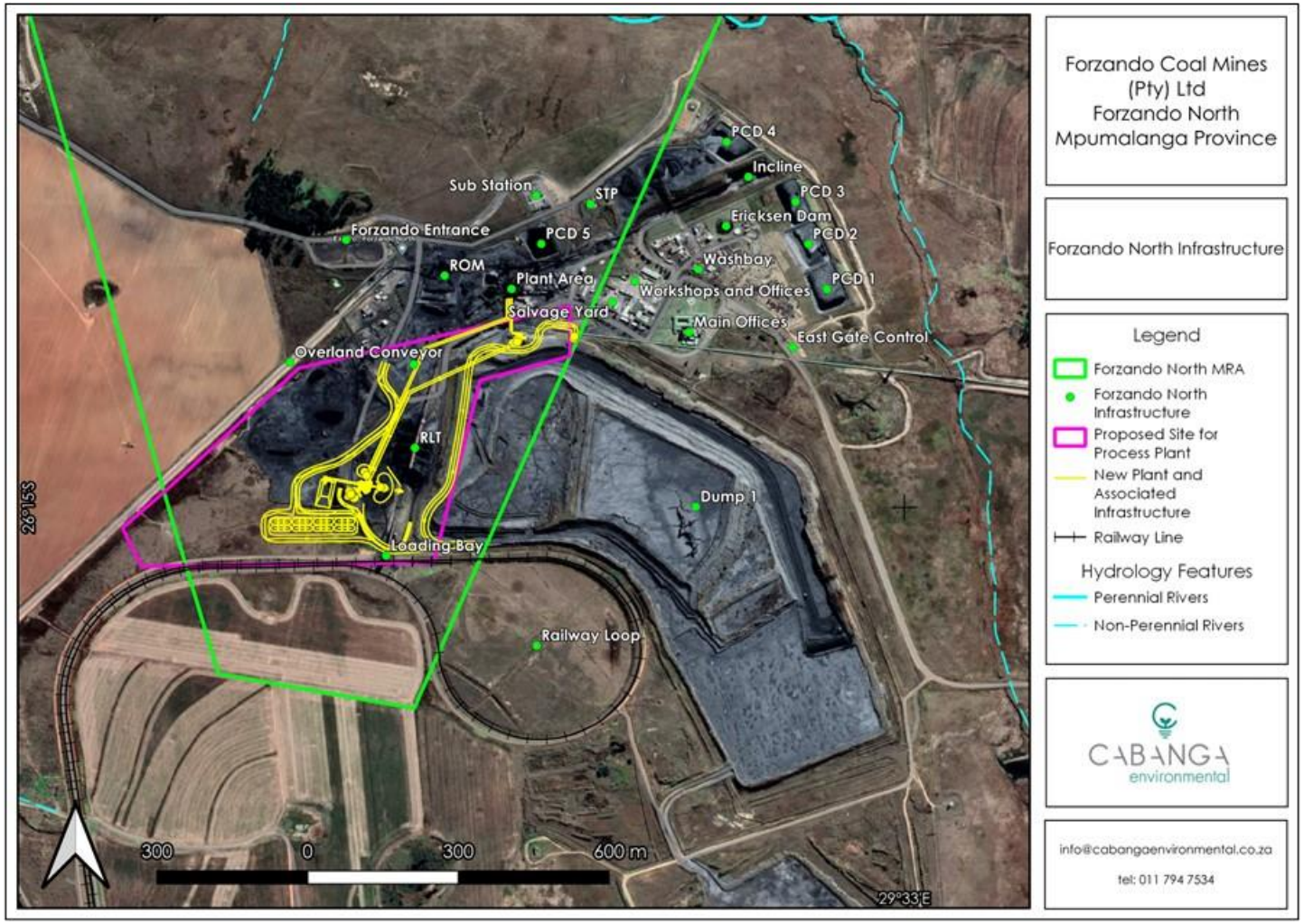


Figure 9: Process Diagram of the proposed plant (drawing supplied by Forzando Coal Mines (Pty) Ltd)



Plan 7: Layout of the proposed processing plant

5.5 Mine Residue Stockpiles and Deposits

5.5.1 Non-carbonaceous Material

Overburden from the construction of the existing boxcut has been stockpiled on site for reuse during decommissioning and closure phase.

5.6 Discard and Slurry

Three discard dumps are associated with the Forzando North operations however, only one is currently operational (dump no. 3)[4]. This dump will continue to be utilised for the remaining LoM and no additional mine residue facilities are associated with the proposed Project.

Two waste streams are generated by the beneficiation process namely, slurry and discard. Coarse discard is and will continued to be conveyed from the plant area to the co-disposal discard dump. The discard stream from the new processing plant will tie into the existing discard conveyor.

Slurry is and will continue to be pumped to the co-disposal dump, via dedicated pumps and pipelines. However the development of the new processing plant will necessitate that an additional slurry pipeline be installed. This pipeline will be fixed to the existing discard conveyor and will be approximately 3,5km in length, with a diameter of 160mm and 22ℓ/second throughput.

5.7 Water Management, Supply and Reticulation

5.7.1 Stormwater Management

Clean and dirty stormwater is separated in terms of GN704 with clean water being diverted around the mine's infrastructure area and dirty water contained in the Pollution Control Dams (PCDs).

In total there are seven (7) PCDs located at the Mine, five (5) of which are located at the plant and infrastructure area as depicted in Figure 10; and two (2) located at the co-disposal discard dump (dump No. 3) (O.F.S Consulting (Pty) Ltd, 2020):

- PCD 1 has a confirmed storage capacity of 14 800m^3. This dam has a small catchment area (workshop and wash bay area) and receives water from the Discard Dump No. 1 inflow canal.
- PCD 2 has a reported capacity of 8 000m^3. This dam receives overflow water from PCD 1 and has a small catchments area. When full this dam overflows to PCD 3.
- PCD 3 has a reported capacity of 4 300m^3. This dam receives runoff from the administration complex. This dam also receives overflow from PCD 2.
- PCD 4 has a confirmed capacity of 15 608m^3 and PCD 5 is 3 500m^3, these dams receive dirty water runoff from the plant and coal stockpile area as illustrated in Figure 11. The most recent surface water management plan (O.F.S Consulting (Pty) Ltd, 2020)

[4] Discard dump no. 1 has been reclaimed with only the starter walls remaining. Discard dump no. 2 is currently being reclaimed.

proposes that a diversion channel be installed to divert some of the runoff away from these PCDs to PCDs 1 – 3.

- PCDs 6 and 7 serve as return water dams for the co-disposal discard dump (dump No. 3) and have a combined storage capacity of 74 790m^3. Return water is pumped from here to PCD 1, where it is incorporated into the mine's water balance.

The proposed processing plant, and stockpile extension area, will be developed within the catchment area of PCDs 4 and 5.

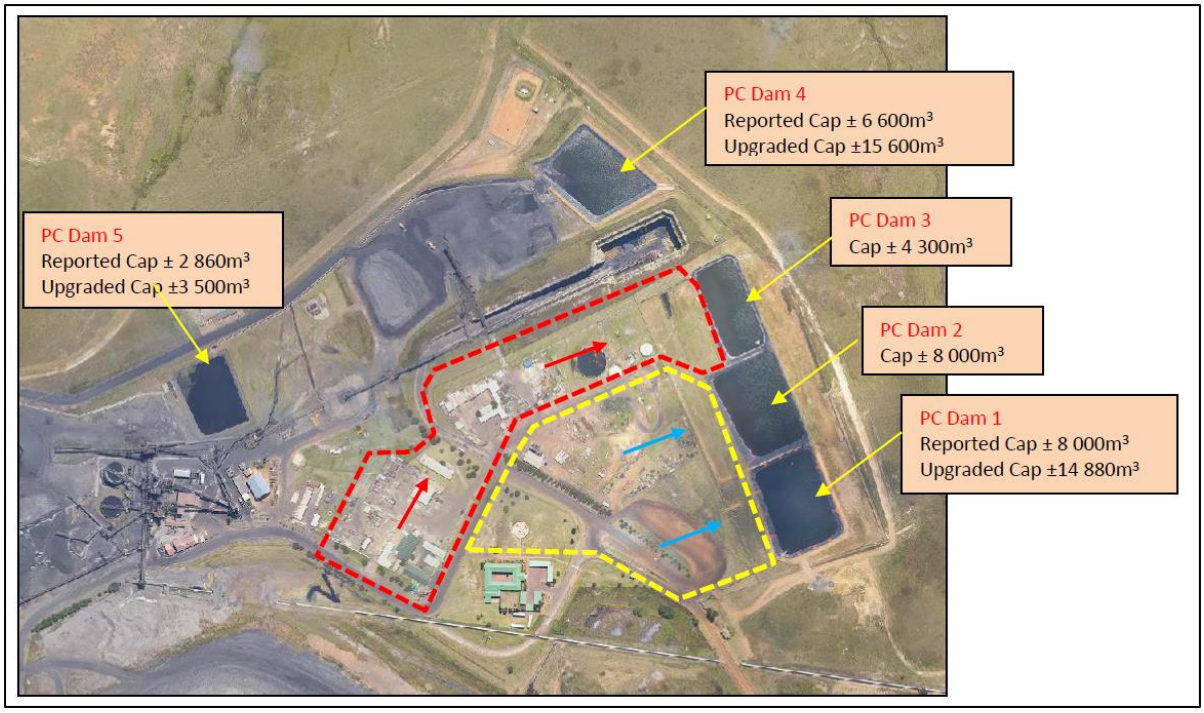


Figure 10: PCDs 1 – 5 located at the plant and stockpile area (O.F.S Consulting (Pty) Ltd, 2020)

Figure 11: Catchment Areas of PCDs 4 and 5 (O.F.S Consulting (Pty) Ltd, 2020)

5.7.2 Potable Water

Water for domestic and potable purposes is obtained from the Usuthu Vaal Scheme and treated via reverse osmosis at the onsite water treatment plant. The treated water is stored within the small Erikson Dams and Jojo Tanks from where it supplies potable water to the plant offices, workshop offices, change houses, and administration complex (O.F.S Consulting (Pty) Ltd, 2020).

The proposed project changes will not result in an increase in the number of employees and it is anticipated that the existing potable water supply will meet the capacity requirements. The current and future potable water requirements are summarised in Table 6 below.

Table 6: Potable Water Requirements (Forzando Coal Mines (Pty) Ltd, 2023)

Potable Water - Washrooms and Consumption		
Average Demand	Total Users / Day	4 200
Water Demand	Kilolitre / Cap / Day	0.008

Potable Water - Washrooms and Consumption		
Average Daily Demand	Kilolitre / Day	34
Peak Demand	Litres / Second	0.43
Offices	Kilolitre / Day	34
Total Potable	Kilolitre / Day	34
Contingency	%	10
Allow for	Kilolitre / Day	3.4

5.7.3 Process Water

Water is recycled on site as far as possible and dirty water from the PCDs is prioritised for use within the processing plant(s), for use underground (coal cutting) and for dust suppression. Make water is obtained from the Usuthu Vaal Scheme, if and when required. The Mine is entitled to use a maximum of 600 000 m^3/annum (50,000 m^3/month) from the scheme. This water is stored within the big Erikson Dam (O.F.S Consulting (Pty) Ltd, 2020).

The process water demand for the operations are summarised in Table 7.

Table 7: Process Water Requirements (Forzando Coal Mines (Pty) Ltd, 2023)

Process Water Requirements		
Underground		
Minimum Demand	Kilolitre / Month	6 824.7
Maximum Demand	Kilolitre / Month	8 341.3
Average Demand	Kilolitre / Month	7 583
Peak Demand	Litres / Second	3.22
Dust Suppression (Water Cart)		
Minimum Demand	Kilolitre / Month	16 353.9
Maximum Demand	Kilolitre / Month	19 988.1
Average Demand	Kilolitre / Month	18 171
Peak Demand	Litres / Second	7.71
Existing Processing Plant		
Average Total	Kilolitre / Month	62 000
	Mega litres / Day	2.07
Maximum Total	Kilolitre / Month	75 000
	Mega litres / Day	2.5
Proposed Processing Plant		
Average Total	Kilolitre / Month	37 121
	Mega litres / Day	1.53
Maximum Total	Kilolitre / Month	40 833
	Mega litres / Day	1.68

5.8 Provision of Services

5.8.1 Power Supply

Eskom supplies power to the Forzando North operations. Electricity is distributed to the mine via a substation, mini-substation(s) and 11 kV overhead powerlines.

Additional overhead powerlines (11 kV) will be associated with the new processing plant and the proposed ventilations shafts, these will be between 2 – 7,5km in length. The powerlines will consist of wooden monopoles, no concrete foundations will be required. Construction will consist of drilling / auguring to a depth of approximately of 1,8m whereafter the pole will be placed and stabilised with infill material. The powerlines will follow the existing and proposed road servitudes.

5.8.2 Waste Management (non-mineralised waste)

Waste streams generated at Forzando North include sewage waste, general domestic waste, and hazardous waste.

Sewage at the Mine is managed via a system of conservancy tanks, from here it is piped to the existing sewage treatment plant (capacity of 45m^3). Treated effluent water from the plant reports to PCD 4.

During the construction of the ventilation shafts, portable toilets will be provided. These will be serviced by a reputable contractor, the Environmental Manager will be required to retain proof of safe and lawful disposal of sewage.

General domestic waste and hazardous waste bins are provided throughout the site to ensure separation of general and hazardous waste at source. Bins are emptied into skips on site (still separated as either general or hazardous waste), these are removed from site by contractors for disposal to relevant recyclers / landfill (as the case may be).

No landfill sites have/will be constructed on site.

5.9 Emissions

No scheduled gaseous emissions will take place on site. Vehicles and machinery emit fumes but these will continue to be serviced and maintained regularly to keep these emissions within the relevant vehicle/machine's specifications.

Dust is and will continue to be monitored and managed on site to ensure these are within the standards set by the Department of Environmental Affairs (DEA) as well as that of the Mine Health and Safety Act, 1996 (MHSA).

5.10 Operating Hours

Forzando North is operational 24-hours per day, 7 days per week, with scheduled shut-downs taking place for maintenance. The mine operates in various shifts.

5.11 Employment

Currently one hundred and seventy one (171) people are permanently employed at Forzando North. The proposed Project changes are not expected to contribute to job creation, but rather focus on the retention of jobs by prolonging the remaining LoM.

5.12 Timeframes for Implementation of the Project

Construction activities are limited to the development of the proposed processing plant, 2 x ventilation shafts and associated infrastructure as described in the aforementioned sections. The construction phase is anticipated to take no more than 12 months to complete.

The mine is currently operational, the Project area annexation is intended to assist Forzando North to maintain production levels over its LoM with mining being scheduled to take place once the reserves at Forzando North are depleted (2028); extending the overall LoM by approximately 11 years (to 2039) (Forzando Coal Mines (Pty) Ltd, 2023).

Decommissioning and Closure activities are expected to take a further 5 years.

The Environmental Authorisation is being sought for a period of 22 years.

6 EXISTING SITE ATTRIBUTES

Just as a project is associated with certain impacts on the environment where it is undertaken, the existing environment can also influence a proposed development in terms of design, location, technology and layout. It is therefore important to define the environmental baseline conditions (*status quo*) or context of a proposed development project.

The Baseline Environment is defined in detail in the BAR which was compiled for the application for Environmental Authorisation. Table 8 provides a summary of environmental aspects of the Mine.

Table 8: Summary of Baseline Environment

Aspect	Description
Climate	The regional climate at Forzando North Coal Mine is characterised by strongly seasonal summer rainfall, with dry winters. The Mean annual precipitation (MAP) for the Project area is ~700 mm whilst the mean annual evaporation (MAE) is 1,552mm (s-pan) (H&H, 2023). Temperatures range from 17 - 27◦C on average in summer and from 0 - 13◦C on average in Winter. The predominant wind direction is east-north east (12.5% of the time), east (10% of the time) and north east (9% of the time) (Rayten, 2023).
Topography	The Project area is characterised by gently undulating topography. Surface elevations at the boundaries range from ~1600 meters above mean sea level (mamsl) on the higher lying areas to approximately 1595 mamsl at the drainages (Aquiscience, 2023).
Geology	Much of the MRA is underlain by sandstone, shale and coal of the Karoo aged Vryheid Formation. A small section of the north west is underlain by Vaalium aged Selons River rhyolite. Alluvial deposits are indicated along sections of the Olifants and Viskuile Rivers. A weathered zone of between 5 – 24m is present, followed by fractured sandstone and shale below the weathered zone. Two mineable coal seams, 2- and 4 Seam, are located beneath the weathered and fractured zones. The No. 4 Seam is relatively consistent in most of the area but thins out towards the south, with a thickness ranging from 2.5 to 5 meters and located approximately 50.1 meters below the roof. There is an interburden of sandstone averaging 21 meters between the 4 Seam floor and 2 Seam roof elevation. The thickness of 2 Seam ranges from 0.9 to 4.9 meters with an average of 2.83 meters, and it is less developed to the south due to dolerite intrusions. The area has numerous dolerite sills and dykes, with felsite expected to occur at depths greater than or equal to 130 meters below the surface (Aquiscience, 2023).

Aspect	Description
Soils, Land Use and Land Capability	The Project area can be classified as rural in nature, with a few informal residential settlements and farmsteads located in close proximity. Surrounding land use includes agriculture (cultivation and grazing), waterbodies and mining (coal). The Soil and Agricultural Potential Assessment identified ten representative soil forms within the Project area, including Ermelo, Carolina, Avalon, Westleigh, Fernwood, Kroonstad, Oakleaf, Didema, Katspruit and Mispah soil forms. The most sensitive soil forms (Ermelo, Carolina, Avalon and Westleigh soil forms) identified within the project area, depending on clay percentage, depth, rock percentage and surface crusting have been assigned to land capability classes II, III, and IV. These classes have then been assigned to land potential classes L3 and L4 given the climatic and land capability conditions. The classified land potential classes are associated with arable lands and can be used for rotation crops and long-term leys. The overall sensitivity of the assessment area can be categorised as "Moderately High" (TBC, 2023a).
Surface Water and Wetlands	The Mine falls within the B11A quaternary catchment within the Olifants Water Management Area (WMA) 2. The Olifants River is the main receiving surface water body for the catchment. Several tributaries consisting of perennial and nonperennial streams occur within the immediate area. Surface water drainage will occur towards the main drainage lines, being the Olifants River to the north and Viskuile River to the west and south. The Olifants River flows in a western direction along the northern boundary of Forzando North MRA. The Viskuile River flows north towards the Olifants River (Aquiscience, 2023). A number of wetlands have been delineated within the MRA. The wetlands were found to provide a Moderately High level of ecoservices, except for seepage systems which offer an Intermediate level of service. The most significant benefits are indirect regulating and supporting services, including enhancing water quality, flood attenuation, and streamflow regulation. The wetlands are also generally considered important from a biodiversity maintenance perspective. None of the wetlands are considered important in terms of their direct provisioning of harvestable resources and cultivated foods for humans (TBC, 2023b).
Groundwater	Two aquifers naturally occur in the area. These two aquifers are associated with a) the upper weathered material, and b) the underlying competent and fractured rock material. Mining of the coal seams has also resulted in the creation of an artificial aquifer system in the underground voids (Aquiscience, 2023). Groundwater flow directions follow surface flow patterns and gradients, contributing to baseflow in major drainage systems. There's a strong correlation between hydraulic heads and surface elevation, meaning groundwater mimics surface topography. The groundwater levels in the area are relatively shallow and are found within a weathered and fractured aquifer (Aquiscience, 2023). The Karoo aquifer is not well-developed and has low effective porosity, leading to restricted groundwater flow. Aquifer tests show low hydraulic conductivity

Aspect	Description
	and transmissivity, indicating a highly heterogeneous nature (Aquiscience, 2023). Dewatering is being undertaken for the safe continuation of mining, water is pumped to the pollution control dams (PCDs) where it is re-used as process water supply. Water for potable and domestic use is sourced from the Usuthu pipeline (Aquiscience, 2023). Forzando North performs routine sampling of groundwater from boreholes located within MRA to monitor the groundwater quality for potential contamination. The boreholes are strategically placed to monitor quality near to mining infrastructure on surface. The analysis of long-term groundwater trends for Forzando North indicates that the pH level remains circum-neutral but there are elevated levels of SO_4 at FNGW01, FNGW08, FNGW11, FNGW12 and FNGW14. Analysis of the water monitoring data indicates that the enrichment of SO_4 may be due to acid or neutral mine drainage reactions. Furthermore, these boreholes are downstream from the mine residue facilities and are thus likely impacted by these sources (Aquiscience, 2023).
Biodiversity	The MRA is located within the Eastern Highveld Grassland national vegetation type of the Mesic Highveld Grassland Bioregion (Mucina & Rutherford, 2006). The Eastern Highveld Grassland is listed as Endangered on the revised national list of threatened ecosystems for South Africa and is characterised by slight to moderately undulating plains consisting of low hills and pan depressions with scattered rocky outcrops. According to the terrestrial Mpumalanga Biodiversity Sector Plan (MBSP) (MTPA, 2022), the MRA overlaps with Critical Biodiversity Areas (CBAs). Five different habitat types were delineated in the Terrestrial Biodiversity Assessment (TBC, 2023d) and include: • Modified; • Alien thicket/plantation; • Rocky outcrop; • Disturbed grassland; and • Water resource.
Heritage and Archaeology	Four sites of cultural heritage significance were identified during the 2023 Heritage Impact Assessment (Archaetnos, 2023). Sites no. 1-3 are all single graves, whilst Site no. 4 was ruins of an old farmstead. The previous EMPr (GCS, 2010) indicates that three grave yards and one historical farm yard (ruins) were recorded in previous surveys. Two of these sites are located in close proximity to the discard conveyor however, no direct impacts are expected and all sites can be managed *in situ* (GCS, 2010).
Paleontological Setting	The MRA lies on non-fossiliferous Jurassic dolerite and potentially very highly sensitive rocks of the Vryheid Formation (Ecca Group, Karoo Supergroup). The formation is characterized by coal seams that formed over time from peat deposits, which were buried and altered by heat and pressure. Although coal seams do not retain the original plant structures, the flora can be identified through impressions or compressions found between the coal seams or in fine-

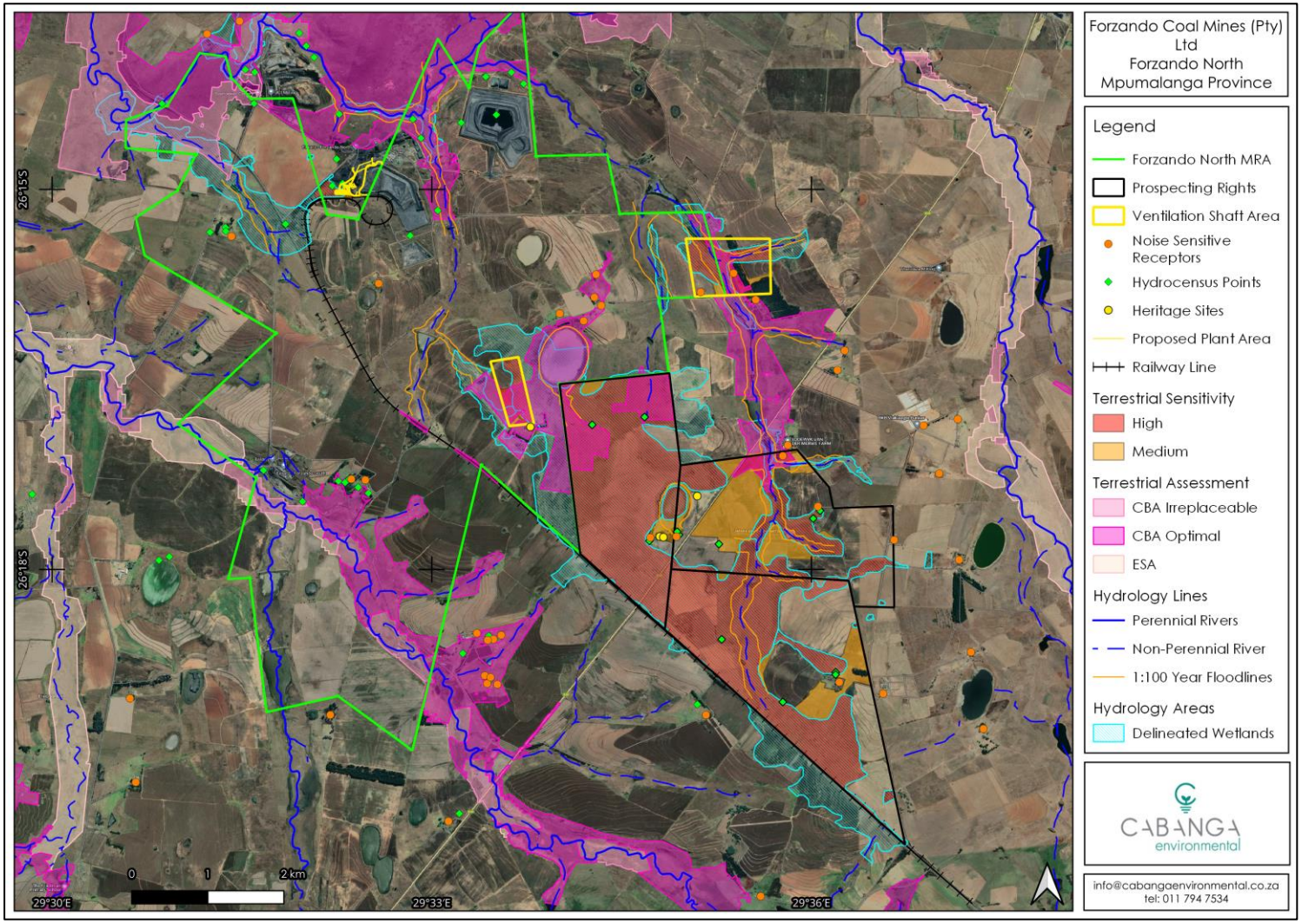
Aspect	Description
	grained sediments. Unlike fossil plants, vertebrates are not found in the Vryheid Formation due to different preservation requirements. Based on the fossil record and confirmed by the site visit and walk through there are no fossils of any significance such as those of recognisable Glossopteris floral elements . It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur in below the ground surface in the shales of the Vryheid Formation so a Fossil Chance Find Protocol has been included in the EMPr.
Air Quality	The site is within the Highveld Priority Area. Existing land use activities that could have significant impacts on air quality in the region, include power generation, coal mining, coal transport and coal processing, vehicle movement on unpaved roads and dust from agricultural activities.
Noise	Based on the measured sound levels (measured over a period of four days in accordance with SANS 10103:2008 at a number of locations in the study area), ambient sound levels in the MRA average at 45dBA in the day and 39.2dBA in the evenings. Ambient sound levels are typical of a rural to sub-urban noise district.
Visual Setting	The Project area is characterised by an agricultural landscape setting, including cultivation of mielies and soy as well as grazing by cattle, sheep and goats. Common to the area are the clusters of blue gum trees that are mostly associated with the farmsteads. In addition, electricity infrastructure and mining activity, have resulted in a high degree of visual degradation of the area.
Socio-Economic	The MRA extends over the Msukaligwa, Steve Tshwete and the Govan Mbeki Local Municipalities, with the Mine's Adit and infrastructure falling within the Govan Mbeki Local Municipality of the Gert Sibande District Municipality. According to StatsSA 2016 Community Survey, Gert Sibande Municipality's population increased from 1 043 194 in the year 2011, to 1 135 409 in the year 2016, indicating a population growth of 1.9% per annum (StatsSA, n.d.). In 2019 the unemployment rate was 28.7% however, job losses in 2020 due to COVID-19 is estimated to be in the region of 30 000 – 39 000 and thus the unemployment rate is expected to have increased to between 35.3% and 37.4%. Some 46,7% of the population within the District fell below the lower-bound poverty line in 2019 (GSDM, 2022).

7 ENVIRONMENTAL SENSITIVITY

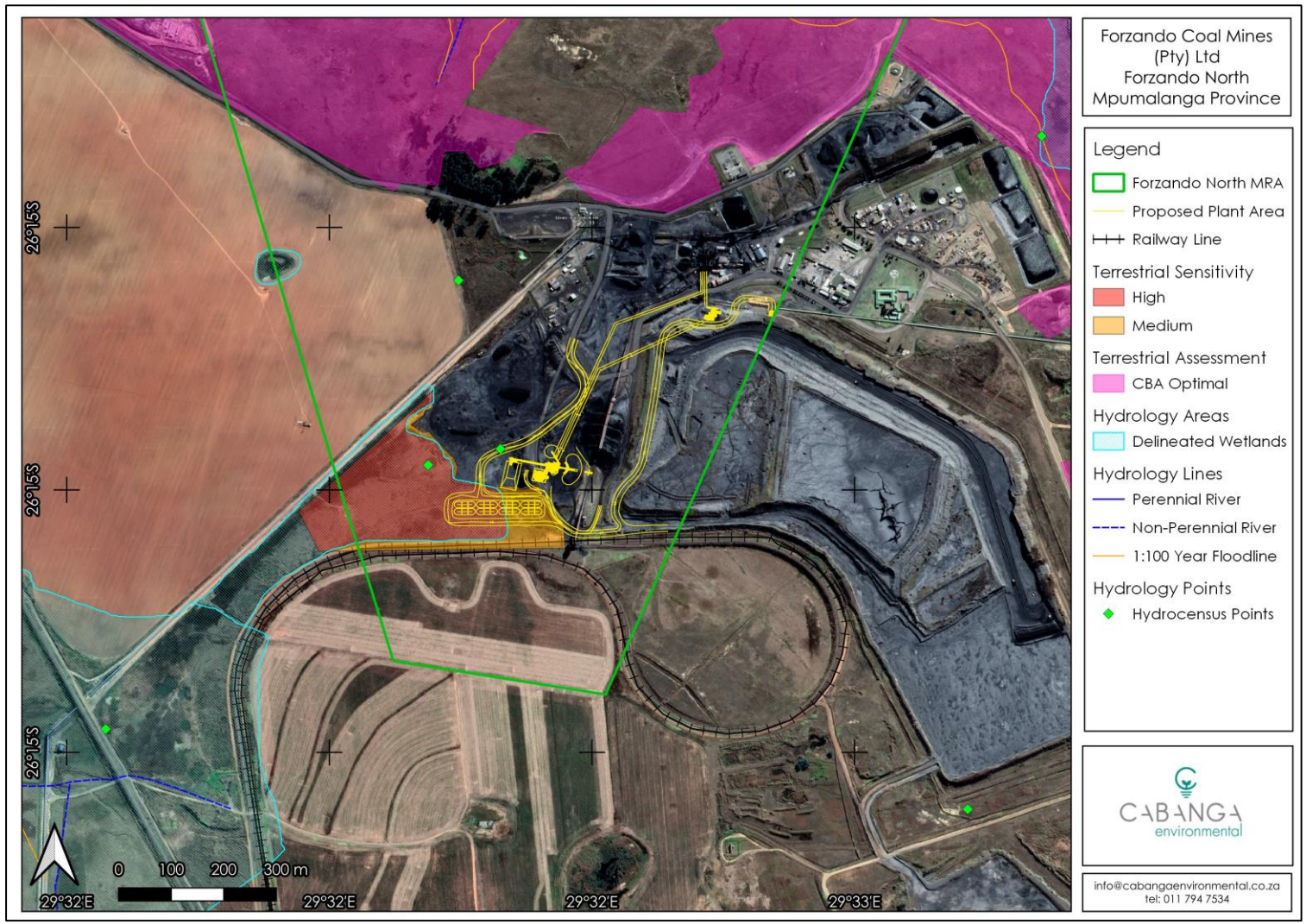
The sensitive environmental features associated with the Project area are as follows:

- Watercourses;
- Wetlands;
- CBAs;
- Flora and fauna species; and
- Graves/heritage sites.

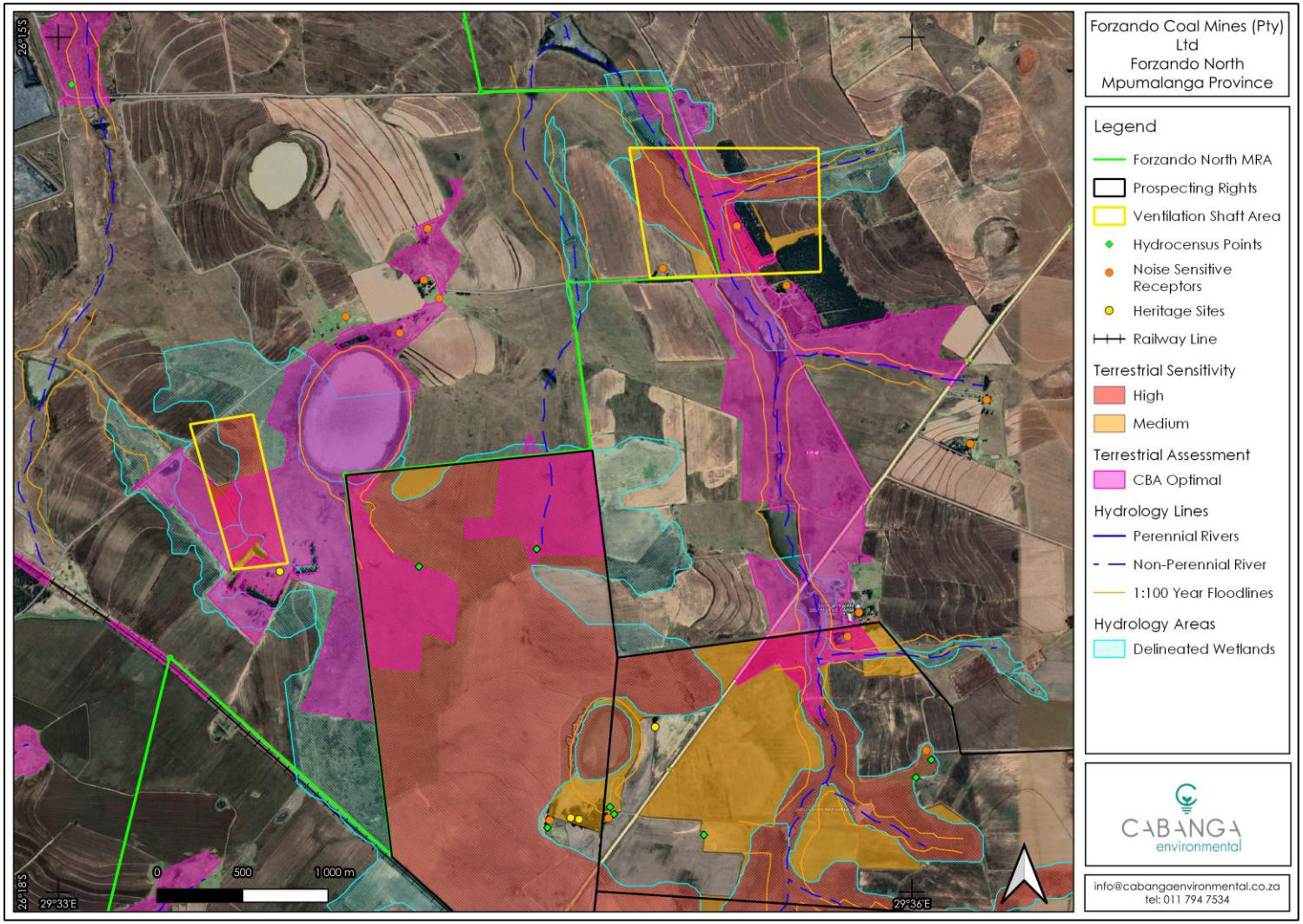
Plan 8 depicts the environmentally sensitive areas, in relation to, the MRA and proposed infrastructure.



Plan 8: Overall Environmental Sensitivity Map



Plan 9: Environmental Sensitivity Map – Zoomed in on proposed Plant area



Plan 10: Environmental Sensitivity Map – Zoomed in on Ventilation Shaft areas

8 FINDINGS OF THE IMPACT ASSESSMENT

A detailed impact assessment was completed for the BAR as part of the Application for Amendment of the Mining Right, and associated Application for Environmental Authorisation. The findings of the Impact Assessment are summarised in Table 9 overleaf, where the following potential negative impacts were rated as **High** or **Significant**, before the implementation of mitigation measures:

- Clearance of vegetation, topsoil stripping and stockpiling will result in the degradation, destruction and fragmentation of portions of sensitive habitats (including wetlands);
- Direct disturbance/degradation / loss of wetlands due to the expansion of the plant and stockpile area;
- Direct disturbance/degradation/loss of wetlands due to the construction of the ventilation shafts;
- Potential destruction/loss of SCC;
- Displacement of faunal community due to habitat loss and disturbance (noise, dust and vibration) and/or direct mortalities as a result of construction activities and operation of machinery/vehicles onsite;
- Increased runoff and erosion ultimately resulting in loss of vegetation communities, and leading to the sedimentation of downstream water resources;
- Potential impacts on water quality due to poor quality seepage, uncontrolled runoff, spills and/or leaks;
- Potential for spontaneous combustion and associated emissions;
- Impact on global climate change due to GHG emissions;
- Potential for physical injuries at the workplace, road traffic incidences and other accidental injuries. Resultant health system issues (increased pressure on health services and infrastructure);
- Alteration of topography and deterioration of visual aesthetics of the area;
- Alteration of geological nature and sequence as a result of mining;
- Potential contamination of surrounding environment as a result of improper waste management/sewage;
- Continued fragmentation and degradation of ecosystems during the Operational and Decommissioning Phases;
- Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light) during the Operational and Decommissioning Phases; and
- Spread or establishment of alien invasive species on rehabilitated ground.

Note: The pre-construction / planning and design phase were not assessed in the BAR as the impacts associated with these activities will not occur during this phase, but rather during subsequent on-site activities.

It is further noted that the majority of the activities are already approved in terms of the previous EMPr and relevant Environmental Authorisations , and only some directly relate to the Application pending approval. All activities have however been included for the sake of providing a single comprehensive EMPr for the Forzando North Coal Mine in the form of this report.

Table 9: Impact Assessment

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
1	Clearance of vegetation, stripping and stockpiling of soils	Degradation, destruction and fragmentation of portions of sensitive habitats (including wetlands)	Terrestrial Biodiversity	Construction	Neg	80	Significant	60	High
		Displacement of faunal community due to habitat loss and disturbance (noise, dust and vibration) and/or direct mortalities	Terrestrial Biodiversity	Construction	Neg	80	Significant	56	Moderate
		Destruction of SCC	Terrestrial Biodiversity	Construction	Neg	68	High	32	Low
		Increased runoff and erosion ultimately resulting in loss of vegetation communities, and leading to the sedimentation of downstream water resources	Surface water, wetlands & associated aquatic ecosystems Terrestrial Biodiversity	Construction, Operational, Decommissioning & Closure	Neg	70	High	24	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Spread or establishment of alien invasive species	Terrestrial Biodiversity	Construction, Operational, Decommissioning & Closure	Neg	56	Moderate	24	Low
		Stockpiles will alter the topographical nature and visual characteristics of the area	Topography, Visual Aesthetics	Construction & Operational	Neg	55	Moderate	40	Moderate
		Loss of land capability / land potential	Soils, Land Use & Land Capability	Construction	Neg	56	Moderate	39	Low
		Loss of topsoil - increased potential for soil erosion	Soils, Land Use & Land Capability	Construction, Operational, Decommissioning	Neg	42	Moderate	26	Low
		Increased infiltration to aquifers	Groundwater	Construction	Neg	18	Insignificant	18	Insignificant
		Increased dust, PM10 & PM2.5	Air Quality	Construction	Neg	44	Moderate	30	Low
		Loss of and disturbance to archaeological, palaeontological and heritage sites	Heritage & Palaeontology	Construction	Neg	36	Low	18	Insignificant

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
2	Operation of machinery and vehicle movement	Impact on global climate change due to GHG emissions	Climate Change	Construction, Operational, Decommissioning	Neg	68	High	48	Moderate
		Compaction and alteration of soil characteristics	Soils, Land Use & Land Capability	Construction, Operational, Decommissioning	Neg	52	Moderate	39	Low
		Potential for environmental pollution due to leaky equipment/vehicles	Soils, Land Use & Land Capability Surface water, wetlands & associated aquatic ecosystems, Groundwater	Construction, Operational, Decommissioning	Neg	48	Moderate	24	Low
		Increased dust, PM10 & PM2.5	Air Quality	Construction	Neg	44	Moderate	30	Low
		Emissions into the atmosphere from machinery, vehicles and generators: Nox, SO2, CO emissions	Air Quality	Construction, Operational, Decommissioning	Neg	52	Moderate	36	Low
		Traffic will result in road degradation and increased potential for road incidences.	Traffic, Social, Health & Safety	Construction, Operational, Decommissioning	Neg	32	Low	15	Insignificant

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
3	Presence of personnel onsite	Staff interacting with potentially dangerous fauna (i.e. snakes, bushpigs etc.)	Traffic, Social, Health & Safety	Construction, Operational, Decommissioning	Neg	26	Low	11	Insignificant
		Increased risk of unfamiliar people may result in a risk of safety to the landowner/user. Increased risk of stock theft/loss.	Social, Health & Safety	Construction, Operational, Decommissioning	Neg	39	Low	24	Low
		Increased risk for veldt fires	Social, Health & Safety	Construction, Operational, Decommissioning	Neg	45	Moderate	28	Low
		Physical injuries at the workplace, road traffic incidences and other accidental injuries. Resultant health system issues (increased pressure on health services and infrastructure).	Social, Health & Safety	Construction, Operational, Decommissioning	Neg	64	High	39	Low
4	Extension of existing haul roads at the plant area (in already disturbed footprint area)	Compaction and alteration of soil characteristics	Soils, Land Use & Land Capability	Construction, Operational, Decommissioning	Neg	52	Moderate	26	Low
5	Service tracks/access routes to the ventilation shafts	Compaction and alteration of soil characteristics	Soils, Land Use & Land Capability	Construction, Operational, Decommissioning	Neg	52	Moderate	26	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Destruction of SCC.	Terrestrial Biodiversity	Construction, Operational, Decommissioning	Neg	68	High	32	Low
		Loss of and disturbance to archaeological, palaeontological and heritage sites	Heritage & Palaeontology	Construction	Neg	36	Low	18	Insignificant
6	Construction of the proposed Plant and expansion of existing stockpile area	Coal stockpiles and plant will alter the topographical nature and visual characteristics of the area	Topography, Visual Aesthetics	Operational	Neg	60	High	33	Low
		Direct disturbance / degradation / loss to wetland due to the expansion of the stockpile area	Wetlands & associated aquatic ecosystems	Construction	Neg	80	Significant	75	High
		Increased erosion and sedimentation	Surface water, wetlands & associated aquatic ecosystems	Construction	Neg	52	Moderate	36	Low
		Potential contamination of water resources/wetlands with machine oils and construction materials	Surface water, wetlands & associated aquatic ecosystems	Construction	Neg	36	Low	22	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Increased dust, PM10 & PM2.5	Air Quality	Construction	Neg	44	Moderate	30	Low
		Deterioration in visual aesthetics	Visual Aesthetics	Construction, Operation, Decommissioning	Neg	44	Moderate	27	Moderate
		Increase in environmental noise levels due to construction activities	Noise	Construction	Neg	27	Low	24	Low
7	Raise bore drilling of 2x Ventilation Shafts, construction and installation of ventilation fans	Direct disturbance / degradation / loss to wetland due to the construction of the shafts.	Wetlands & associated aquatic ecosystems	Construction	Neg	64	High	32	Low
		Increased erosion and sedimentation	Surface water, wetlands & associated aquatic ecosystems	Construction	Neg	52	Moderate	26	Low
		Potential contamination of water resources/wetlands with machine oils and construction materials	Surface water, wetlands & associated aquatic ecosystems	Construction	Neg	36	Low	22	Low
		Increased dust, PM10 & PM2.5	Air Quality	Construction	Neg	44	Moderate	30	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Deterioration in visual aesthetics	Visual Aesthetics	Construction, Operation, Decommissioning	Neg	48	Moderate	30	Low
		Increase in environmental noise levels due to construction activities - day time	Noise	Construction	Neg	27	Low	24	Low
		Increase in environmental noise levels due to construction activities - night time	Noise	Construction	Neg	70	High	33	Low
8	Operation of vent shafts & fans	Potential for increased stormwater runoff leading to Increased erosion and sedimentation.	Surface water, wetlands & associated aquatic ecosystems	Operational	Neg	45	Moderate	28	Low
		Increase in environmental noise levels due to operation of the ventilation fan - day time	Noise	Operational	Neg	10	Insignificant	10	Insignificant
		Increase in environmental noise levels due to operation of the ventilation fan - night time	Noise	Operational	Neg	30	Low	26	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
9	Underground mining (incl. dewatering for the safe continuation of mining)	Impact on global climate change due to fugitive GHG emissions	Climate Change	Operational	Neg	68	High	48	Moderate
		Alteration of geological nature and sequence	Geology	Operational	Neg	75	High	75	High
		Alteration of topography and hydrological characteristics through potential subsidence	Topography Surface water, wetlands & associated aquatic ecosystems	Operational, Decommissioning & Closure	Neg	48	Moderate	16	Insignificant
		Altered hydrological regime due to dewatering	Surface water, wetlands & associated aquatic ecosystems	Operational	Neg	45	Moderate	30	Low
		Cone of depression as a result of active dewatering activities - groundwater quantity	Groundwater	Operational	Neg	56	Moderate	56	Moderate
		Impacts on groundwater quality due to poor quality seepage from the mining area	Groundwater	Operational	Neg	42	Moderate	28	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Destruction of potential palaeontological resources	Heritage & Palaeontology	Operational	Neg	36	Low	18	Insignificant
		Annexation of Prospecting Rights will extend the LoM by an additional 11 years, thus resulting in continued employment for the current workforce	Social	Operational	Pos	75	High	75	High
10	Coal handling and stockpiling incl. conveyances and the beneficiation process (operation of the plant)	Soil pollution as a result of irresponsible handling of coal or generation of coal dust, coal spillages and coal dust deposition	Soils, Land Use & Land Capability	Operational	Neg	42	Moderate	28	Low
		Potential for increased stormwater runoff leading to Increased erosion and sedimentation	Surface water, Wetlands & associated aquatic ecosystems	Operational	Neg	45	Moderate	28	Low
		Potential for increased contaminants entering the wetland systems	Surface water, wetlands & associated aquatic ecosystems	Operational	Neg	45	Moderate	28	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Impacts on water quality due to poor quality seepage and runoff from the coal handling and stockpile areas	Surface water, wetlands & associated aquatic ecosystems Groundwater	Operational	Neg	64	High	30	Low
		Increased dust, PM10 & PM2.5	Air Quality	Operational	Neg	52	Moderate	36	Low
		Increase in environmental noise levels due to numerous, simultaneous operational activities	Noise	Operational	Neg	48	Moderate	36	Low
11	Mine residue handling and disposal: discard and slurry will be disposed of onto the existing, licensed discard dump	Potential for spontaneous combustion and associated emissions	Air Quality	Operational	Neg	60	Moderate	30	Low
		Impacts on water quality due to poor quality seepage and uncontrolled runoff	Surface water, wetlands & associated aquatic ecosystems, Groundwater	Operational, Decommissioning & Closure	Neg	64	High	30	Low
12	Installation and operation of the slurry pipeline	Environmental pollution due to potential leaks	Soils, land use & land capability, surface water, wetlands & associated aquatic ecosystems, Groundwater	Operational	Neg	48	Moderate	28	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
13	Installation and operation of water reticulation pipelines	Environmental pollution due to potential leaks	Soils, land use & land capability, surface water, wetlands & associated aquatic ecosystems, Groundwater	Operational	Neg	45	Moderate	26	Low
14	Installation and operation of electricity distribution infrastructure	Destruction of SCC	Terrestrial Biodiversity	Construction	Neg	68	High	32	Low
		Loss of and disturbance to archaeological, palaeontological and heritage sites	Heritage & Palaeontology	Construction	Neg	36	Low	18	Insignificant
		Deterioration in visual aesthetics	Visual Aesthetics	Construction, Operation, Decommissioning	Neg	44	Moderate	27	Low
15	Refuse and waste management	Potential contamination through littering and/or incorrect waste disposal	Surface water, wetlands & associated aquatic ecosystems, Terrestrial Biodiversity, Soils	Construction, Operational, Decommissioning & Closure	Neg	42	Moderate	26	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Deterioration in visual aesthetics	Visual Aesthetics	Construction, Operational, Decommissioning & Closure	Neg	44	Moderate	20	Low
		Potential for pests and vermin	Social, Health & Safety	Construction, Operational, Decommissioning & Closure	Neg	26	Low	22	Low
		Potential contamination of surrounding environment with sewage	Surface water, wetlands & associated aquatic ecosystems, Terrestrial Biodiversity, Soils	Construction, Operational, Decommissioning & Closure	Neg	60	High	24	Low
		Exposure to potentially hazardous materials, waste and malodours	Social, Health & Safety	Construction, Operational, Decommissioning & Closure	Neg	33	Low	20	Low
16	Maintenance and operation of existing Mine infrastructure and facilities	Impact on global climate change due to GHG emissions	Climate Change	Operational	Neg	68	High	48	Moderate
		Continued fragmentation and degradation of ecosystems	Terrestrial Biodiversity	Operational	Neg	75	High	56	Moderate
		Spread or establishment of alien invasive species	Terrestrial Biodiversity	Construction, Operational, Decommissioning & Closure	Neg	56	Moderate	24	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Erosion and resulting loss of vegetation communities	Terrestrial Biodiversity	Operational	Neg	56	Moderate	24	Low
		Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light)	Terrestrial Biodiversity	Operational	Neg	75	High	39	Low
17	Storage and use of dangerous goods / Hazardous Substances	Environmental pollution due to hydrocarbon/chemical contamination into the natural environment.	Soils, Land Use & Land Capability Surface water, wetlands & associated aquatic ecosystems, Groundwater	Operational, Decommissioning	Neg	56	Moderate	24	Low
18	Operation and maintenance of the existing stormwater management system	Reduction in catchment yield due to containment of dirty water on site	Surface water, wetlands & associated aquatic ecosystems	Operational	Neg	40	Moderate	36	Low
		Potential for poor quality water impacting on groundwater and/or surface water and wetlands if pipelines or dams/trenches burst, spill or leak.	Surface water, wetlands & associated aquatic ecosystems, Groundwater	Operational, Decommissioning	Neg	60	High	39	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
19	Water use	Irresponsible use of water and water wastage.	Surface water, Groundwater	Construction, Operational, Decommissioning	Neg	45	Moderate	30	Low
20	Sealing and closure of underground portal. Backfilling of boxcut adit. Removal of surface infrastructure and general rehabilitation. Decommissioning and Closure of Mine	Profiling and restoration of free drainage	Topography, Hydrology	Decommissioning	Pos	56	Moderate	56	Moderate
		Potential loss or degradation of nearby wetlands through inappropriate closure	Surface water, wetlands & associated aquatic ecosystems	Decommissioning	Negative	60	High	30	Low
		Increased runoff and erosion ultimately resulting in loss of vegetation communities, and leading to the sedimentation of downstream water resources	Surface water, wetlands & associated aquatic ecosystems Terrestrial Biodiversity	Decommissioning	Negative	56	Moderate	24	Low
		Continued fragmentation and degradation of ecosystems	Terrestrial Biodiversity	Decommissioning	Negative	75	High	52	Moderate
		Spread or establishment of alien invasive species	Terrestrial Biodiversity	Decommissioning	Negative	60	High	26	Low

No	Activity	Impact / Risk Description	Aspect	Phase	Nature of Impact	Significance (without Mitigation)		Significance (with Mitigation)	
		Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light)	Terrestrial Biodiversity	Decommissioning	Negative	75	High	36	Low
		Increased dust, PM10 & PM2.5	Air Quality	Decommissioning	Negative	48	Moderate	33	Low
		Increase in environmental noise levels decommissioning and rehabilitation activities	Noise	Decommissioning	Negative	36	Low	24	Low
		Retrenchment/loss of employment and procurement opportunities	Social	Decommissioning & Closure	Negative	75	High	75	High
		Void recharge and potential for decant	Groundwater, Surface water, wetlands & associated aquatic ecosystems	Closure	Negative	42	Moderate	28	Low
		Soil replacement, amelioration and seeding. Vegetative cover and plant community succession. Influx of Animals to the area once vegetation establishes.	Terrestrial Biodiversity	Closure	Positive	65	High	65	High
		Improvement in visual aesthetics	Visual Aesthetics	Closure	Positive	48	Moderate	48	Moderate

9 MANAGEMENT AND MITIGATION MEASURES

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts and prevent the realisation of these impacts -PREVENTION.
- To ensure activities that are expected to impact on the environment are undertaken and controlled in such a way so as to minimise their impacts – MODIFY and/or CONTROL.
- To ensure a system is in place for treating and/or rectifying any significant impacts that will occur due to the proposed activity – REMEDY.
- Implement an adequate monitoring programme to:
    - Ensure that mitigation and management measure are effective.
    - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
    - Reduce duration of any potential negative impacts.

Table 10 indicates management actions and outcomes required for each of the identified impacts during the Construction, Operational, Decommissioning and Closure Phases.

Before any activities are physically undertaken for the proposed Project changes, action can already be taken to pro-actively put management measures in place. Failure to do so could result in more significant impacts manifesting later on. The following is required prior to development of the proposed plant, expanded stockpile area, ventilation shafts and associated infrastructure:

- A final walk down must be undertaken by a registered ecologist to ensure the construction of the Project does not affect sensitive or protected plant or animal species within the footprint of the proposed development.
- The Environmental Manager must check that the relevant management plans are in place and updated, these may include but not limited to:
    - The Storm Water Management Plan (based on the principles outlined in Appendix G 1) must be finalised and in place before any other construction activities take place.
    - Search, Rescue and Relocation Plan for protected plant species (based on the principles outlined in Appendix G 2) (to be updated by a registered ecologist);
    - Alien Invasive Management Plan (based on the principles outlined in Appendix G 3);
    - Rehabilitation plan (based on the principles outlined in Appendix G 4);
- Permits for the removal, destruction or relocation of floral SCC must be obtained if and where relevant.
- Written approvals that may be necessary in terms of structures and activities on site will be obtained prior to activities being carried out. Amongst others this includes:
    - Written authorisation from the Chief Fire Inspectorate for diesel storage facilities, explosives and firefighting facilities/infrastructure on site.
    - The necessary authorisations must be obtained from Eskom to undermine the power lines where applicable.
- It is recommended that a photographic record be undertaken of the farm house(s) on Portions 0 (RE), 8 of the farm Bankpan 225 IS and Portion 0 (RE) of the farm Killowen 465

IS prior to undermining. Should any underground blasting be required, this should be communicated to the landowners / users beforehand.

- Furthermore, the boreholes on Portions 0 (RE), 8 of the farm Bankpan 225 IS and Portion 0 (RE) of the farm Killowen 465 IS must be pump tested and the yields recorded, prior to the area being undermined.

Table 10: Impact Management Actions and Outcomes

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
1	Clearance of vegetation, stripping and stockpiling of soils	Degradation, destruction and fragmentation of portions of sensitive habitats (including wetlands)	Demarcate the construction footprint and laydown area. Limit construction activities to this area. All vehicles and personnel must make use of existing routes/roads as far as possible. Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation. All grazing mammals must be kept out of the areas that have recently been re-planted. Dust suppression to be undertaken in all construction areas, this includes wetting of exposed soft soil surfaces and the use of environmentally friendly dust suppressant products (if required).	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Planning & Construction Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Displacement of faunal community due to habitat loss and disturbance (noise, dust and vibration) and/or direct mortalities	Once the development layout has been confirmed, the footprint area must be fenced off appropriately in segments to allow animals to move or be moved out of these areas before breaking ground activities occur Construction activities must take place systemically and the perimeter fence should not be completed (i.e., leaving sections unfenced to allow fauna to escape) until systematic clearing is completed. Animal permeable fencing should be used to prevent collisions with fences and retardation of faunal movement. Holes 30 cm x 30 cm should be placed at regular intervals along the fence line. Markers to be placed on fencing. The area must be walked though prior to construction to ensure no faunal species remain in the habitat and get killed. Should animals not move out of the area on their own relevant specialists must be contacted to advise on how the species can be relocated. No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Planning & Construction Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Destruction of SCC	A search and rescue plan must be developed and executed to relocate plant species of conservation concern (that should be confirmed through a site visit in September) into the on-site relocation areas already used for transplantation of rescued plants or if not available, then to similar habitat recommended by a specialist.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA. Mpumalanga Nature Conservation	Planning Phase	Compliance to search and rescue plan and relevant permits.	Once-off	Environmental Manager

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
					Act (Act No. 10 of 1998).				
		Increased runoff and erosion ultimately resulting in loss of vegetation communities, and leading to the sedimentation of downstream water resources	Ensure proper storm water management is in place prior to construction. Only strip vegetation as necessary. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there. Vegetate soil stockpiles. Revegetate all denuded areas as soon as possible.	Prevent erosion from occurring, thereby preventing loss of soil (and siltation of downstream water bodies).	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM. Remediation as required.	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in January)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist
		Spread or establishment of alien invasive species	Implement the alien management plan, which must highlight control priorities and areas and provide a programme for long-term control. Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures based on monitoring results to enable adaptive management in terms of alien invasive plant control.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and CARA.	Throughout LoM.	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Stockpiles will alter the topographical nature and visual characteristics of the area	Stockpiles must be kept to a maximum height of 4m if space allows. Vegetate all long term stockpiles and berms.	Limit the visual impacts on surrounding land users.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Loss of land capability / land potential	Demarcate the construction footprint and laydown area. Limit construction activities to this area. Topsoil is to be stripped when the soil is dry, as to reduce compaction. Topsoil must only be handled twice, once to strip, and once to enable rehabilitation. Bush clearing contractors will only clear bushes and trees larger than 1m; the remaining vegetation will be stripped with the top 0.3 m of topsoil to conserve as much of the nutrient cycle, organic matter and seed bank as possible. The subsoil approximately 0.3 – 0.8 m thick can then be stripped and stockpiled separately. Stockpiles must be kept to a maximum height of 4m if space allows. Soil can be stockpiled to a height of 10m where it is absolutely necessary, keeping the 10m footprint as small as possible. Rehabilitate disturbed areas as soon as possible. After construction activities are completed, all areas no longer required for operations will be fully rehabilitated. Rehabilitated areas must be contoured and free draining to prevent pooling of water and vegetated with indigenous species to prevent erosion. Compacted areas are to be ripped to loosen the soil structure. A soil fertility and post-mining land capability assessment must be done to address any compaction or fertility issues that may arise from the stockpiling (post-rehabilitation).	Protect the soil physical and chemical properties as far as possible.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM. Remediation as required.	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Loss of topsoil - increased potential for soil erosion	Ensure proper storm water management is in place prior to construction. Only strip vegetation as necessary. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there. Vegetate soil stockpiles. Revegetate all denuded areas as soon as possible.	Prevent erosion from occurring, thereby preventing loss of soil (and siltation of downstream water bodies).	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM. Remediation as required.	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Increased infiltration to aquifers	No specific mitigation required.	'-	General duty of Care in terms of NEMA. Compliance	-	-	-	-

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
					with NWA and GN 704.				
		Increased dust, PM10 & PM2.5	Demarcate the construction footprint and laydown area. Limit construction and vegetation clearance activities to this area. Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation. A water cart will be used to spray gravel roads and relevant areas when dust levels are high. Speed limits will be established to minimise dust generation.	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Planning & Construction Phase	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM_{10} & $PM_{2.5}$ via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist Environmental Manager / External Consultant
		Loss of and disturbance to archaeological, palaeontological and heritage sites	All graves and heritage sites to be demarcated. 50m buffer zone to be implemented. A heritage specialist must be appointed to compile a site preservation management plan. All vehicles and personnel must make use of existing routes/roads as far as possible. Should any graves/fossils/archaeological artefacts be unearthed, all work must stop and the chance find procedure implemented. All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including information on the chance find protocol.	Ensure preservation of graves, heritage sites and fossils.	Compliance with the NHRA. General Duty of Care in terms of NEMA.	Planning & Construction Phase	Visual inspections of all identified graves. EMPr compliance audit. Remediation as and when needed.	Quarterly while mining is occurring beneath the sites Annually	Environmental Manager External Auditor
2	Operation of machinery and vehicle movement	Impact on global climate change due to GHG emissions	Implement a payload management system or investigate options to improve the current system if such a system is already in place. Implement a diesel energy-efficiency management programme. Optimise the loading of haul trucks and adjust construction truck engines to ensure optimal energy efficiency. Investigate the use of alternative fuels (i.e. biofuels, ethanol fuels) where possible.	Reduce the combined GHG emissions. Target of 5% per annum.	General duty of care in terms of NEMA. Compliance with NEMAQA and National Greenhouse Gas Emissions Reporting Regulations, 2017 (Notice 275 of 2017) (NGERs)	Throughout LoM	Measure and report on GHG emissions as per NGERs.	Annually	Environmental Manager/External Consultant
		Compaction and alteration of soil characteristics	Only designated routes to be used so as to limit the possibility of compaction.	Reduce compaction of soils and maintain land capability.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Potential for environmental pollution due to leaky equipment/vehicles	Machines to be parked at a hard park area. Drip trays to be placed under any leaky vehicles or machinery. All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Servicing of vehicles and machinery is only permitted within designated workshop areas. Spill kits to be provided at all areas where hydrocarbons, chemicals etc are stored and/or handled and site personnel trained on the use thereof. All spills must be report to the Environmental Manager and cleaned up immediately. All contaminated soil / yard stone shall be treated *in situ* or removed and be placed in containers for disposal at an appropriately licensed site.	To ensure protection of water resources and continued functioning of aquatic ecosystems. Maintain land capability.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring. Inspection of service records.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) - quarterly Quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory Workshop Manager
		Increased dust, PM10 & PM2.5	A water cart will be used to spray gravel roads and relevant areas when dust levels are high. Speed limits will be established to minimise dust generation. Trucks transporting coal must not be overloaded and must be covered.	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Construction	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist
		Emissions into the atmosphere from machinery, vehicles and generators: Nox, SO2, CO emissions	All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Where possible, use cleaner fuels.	Minimise gaseous emissions into the atmosphere.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Throughout LoM	Inspection of service record.	Quarterly	Workshop Manager
		Traffic will result in road degradation and increased potential for road incidences.	Regular inspections by the Mine of the main routes to and from the site, along with regular reporting to and liaison with the relevant roads authorities. Maintain a complaints register and record community complaints regarding the state of roads. Resolve complaints in consultation with the roads authorities.	To minimise disruption to existing road network and traffic. To prevent road safety incidents.	Compliance with National Road Traffic Act, Act No. 93 of 1996 (NRTA). Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well as the Basic Conditions of Employment Act.	Throughout LoM	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
3	Presence of personnel onsite	Staff interacting with potentially dangerous fauna (i.e. snakes, bushpigs etc.)	All employees and contractors should receive Health and Safety induction which must include an environmental awareness component,	Limit occupation hazards and potential for incidences.	Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well	Throughout LoM	Review of Training / Induction Programme.	Annually	SHE Officer & Environmental Manager

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
					as the Basic Conditions of Employment Act.				
		Increased risk of unfamiliar people may result in a risk of safety to the landowner/user. Increased risk of stock theft/loss.	Contractors and site personnel must carry company identification. All farm gates must be kept closed. Any employee or contractor found guilty of stock theft and/or misconduct will be dealt with according to Forzando Coal Mine's disciplinary procedures. No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this.	Limit possibilities for opportunistic criminals.	Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well as the Basic Conditions of Employment Act.	Throughout LoM	Review of Training / Induction Programme.	Annually	SHE Officer & Environmental Manager
		Increased risk for veldt fires	No open fires will be permitted on site. Fire extinguishers will be provided. All contractors and site personnel must undergo induction and environmental awareness training. Forzando Coal Mines will join the local fire protection association. In the event that there is no fire protection association Forzando will join local community groups to stay in contact with local landowners and users.	Prevent and control fires.	Compliance with National Veld and Forest Fire Act, Act 101 of 1998 and CARA.	Throughout LoM	Visual inspections. EMPr compliance audit. Review of training/induction programme.	Weekly Annually Annually	Environmental Manager External Auditor
		Physical injuries at the workplace, road traffic incidences and other accidental injuries. Resultant health system issues (increased pressure on health services and infrastructure).	All employees and contractors should receive Health and Safety induction. Employees will be provided with the necessary personal protective equipment (PPE).	Limit occupation hazards and potential for incidences.	Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well as the Basic Conditions of Employment Act.	Throughout LoM	Visual inspections. Review of Training / Induction Programme.	Daily Annually	SHE Officer
4	Extension of existing haul roads at the plant area (in already disturbed footprint area)	Compaction and alteration of soil characteristics	Only designated routes to be used so as to limit the possibility of compaction.	Reduce compaction of soils and maintain land capability.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
5	Service tracks/access routes to the ventilation shafts	Compaction and alteration of soil characteristics	Use existing farm roads as far as possible.	Reduce compaction of soils and maintain land capability.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Planning Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Destruction of SCC	Sign-off of all off-road routes to be obtained from the Environmental Manager and Land Owner prior to use. All routes must be walked through at least once, by a registered Ecologist, prior to any activities commencing.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Planning Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			A search and rescue plan must be developed and executed to relocate plant species of conservation concern (that should be confirmed through a site visit in September) into the on-site relocation areas already used for transplantation of rescued plants or if not available, then to similar habitat recommended by a specialist.		Mpumalanga Nature Conservation Act (Act No. 10 of 1998).				
		Loss of and disturbance to archaeological, palaeontological and heritage sites	All graves and heritage sites to be demarcated. 50m buffer zone to be implemented. A heritage specialist must be appointed to compile a site preservation management plan. All vehicles and personnel must make use of existing routes/roads as far as possible. All routes must be walked through at least once prior to any activities commencing on site, to ensure no graves were missed during the HIA. Should any graves/fossils/archaeological artefacts be unearthed, all work must stop and the chance find procedure implemented. All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including information on the chance find protocol.	Ensure preservation of graves, heritage sites and fossils.	Compliance with the NHRA. General Duty of Care in terms of NEMA.	Planning & Construction Phase	Visual inspections of all identified graves. EMPr compliance audit. Remediation as and when needed.	Quarterly while mining is occurring beneath the sites Annually	Environmental Manager External Auditor
6	Construction of the proposed Plant and expansion of existing stockpile area	Coal stockpiles and plant will alter the topographical nature and visual characteristics of the area	Move coal stockpiles on a first-in-first-out basis to reduce extent of coal stockpile areas. Coal stockpile and handling must be in the designated areas only.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Operational	Visual Inspections	Weekly	Plant Manager
		Direct disturbance / degradation / loss to wetland due to the expansion of the stockpile area	A wetland rehabilitation plan must be compiled and implemented for the relative components.	To rehabilitate the affected wetland area and ensure continued functioning of the aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Planning and Construction Phase	EMPr & IWUL Compliance Audit.	Annually	Environmental Manager & External Auditor
		Increased erosion and sedimentation	Ensure proper storm water management is in place prior to construction. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. No activities are permitted within the wetland and associated buffer areas, unless authorised. Landscape and re-vegetate all unnecessarily denuded areas as soon as possible.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Planning and Construction Phase	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Potential contamination of water resources/wetlands with machine oils and construction materials	Machines to be parked at a hard park area. Drip trays to be placed under any leaky vehicles or machinery. All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Servicing of vehicles and machinery is only permitted within designated workshop areas. Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility. Store all chemicals and hydrocarbons in designated and sufficiently bunded areas (110% capacity if roofed, and 120% if not roofed). Access to these areas will be restricted to those personnel who have received training in the storage and handling of hazardous substances, and the emergency clean-up procedure. Spill kits to be provided at all areas where hydrocarbons, chemicals etc are stored and/or handled and site personnel trained on the use thereof. All spills must be report to the Environmental Manager and cleaned up immediately. All contaminated soil / yard stone shall be treated *in situ* or removed and be placed in containers for disposal at an appropriately licensed site. All vehicles must remain on demarcated roads. All construction waste must be removed from site at the closure of the construction phase. Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from the natural environment, before being removed from site.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA. Compliance with NWA and GN 704.	Construction	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring. Inspection of service records.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) - quarterly Quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory Workshop Manager
		Increased dust, PM10 & PM2.5	Demarcate the construction footprint and laydown area. Limit construction and vegetation clearance activities to this area. Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation. A water cart will be used to spray gravel roads and relevant areas when dust levels	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Planning & Construction Phase	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			are high. Speed limits will be established to minimise dust generation.						
		Deterioration in visual aesthetics	Demarcate the construction footprint and laydown area. Limit construction activities to this area. After construction activities are completed, all areas no longer required for operations will be fully rehabilitated.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Planning & Construction Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Increase in environmental noise levels due to construction activities	All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including noise. Implement a line of communication (i.e. helpline where complaints can be lodged). Investigate any reasonable and valid noise complaint if registered by a receptor within 2,000m. Feedback must be provided to the affected stakeholder(s) with steps taken to mitigate the impact (if valid complaint) or preventative steps to minimise this from happening again. Investigate the use of white-noise alarms instead of tonal reverse alarms on heavy vehicles operating on roads, within the mining area and at the plant and stockpile areas. Minimise active night-time construction activities within 600m from verified NSR.	Minimise the generation of nuisance noises and address complaints where possible. The operation may not increase the existing ambient sound levels by more 7dB at dwellings used for residential purposes (a disturbing noise and prohibited by the South African Noise Control Regulations).	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Planning and Construction Phase	Inspect Complaints register. Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11. EMPr Compliance Audit.	Weekly. Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction. Annually.	Environmental Manager External Consultant/Specialist External Auditor
7	Raise bore drilling of 2x Ventilation Shafts, construction and installation of ventilation fans	Direct disturbance / degradation / loss to wetland due to the construction of the shafts.	Adhere to the prescribed wetland buffer of 50m for the vent shafts. Demarcate the construction footprint and laydown area. Limit construction activities to this area. Minimise and restrict site clearing to areas required for construction purposes only and prevent disturbance to adjacent undisturbed vegetation. Design and implement stormwater measures, reporting clean water to the downslope wetlands. Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the overall master plan (indicating no-go areas). No vehicles or heavy machinery will be allowed to drive indiscriminately within any wetland areas or their buffer areas. All vehicles must remain on demarcated roads.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Planning & Construction Phase	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Increased erosion and sedimentation	Ensure proper storm water management is in place prior to construction. Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash. No activities are permitted within the wetland and associated buffer areas, unless authorised. Landscape and re-vegetate all unnecessarily denuded areas as soon as possible.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Planning & Construction Phase	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist
		Potential contamination of water resources/wetlands with machine oils and construction materials	Machines to be parked at a hard park area. Drip trays to be placed under any leaky vehicles or machinery. All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Servicing of vehicles and machinery is only permitted within designated workshop areas. Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility. Appropriately contain any generator diesel storage tanks within a bunded facility (110% capacity if roofed, and 120% if not roofed). Access to these areas will be restricted to those personnel who have received training in the storage and handling of hazardous substances, and the emergency clean-up procedure. Spill kits to be provided at all areas where hydrocarbons, chemicals etc are stored and/or handled and site personnel trained on the use thereof. All spills must be report to the Environmental Manager and cleaned up immediately. All contaminated soil / yard stone shall be treated *in situ* or removed and be placed in containers for disposal at an appropriately licensed site. No vehicles or heavy machinery will be allowed to drive indiscriminately within any wetland areas or their buffer areas. All vehicles must remain on demarcated roads. Cement mixing may not be performed on the ground. It is recommended that only closed side drum or pan type concrete mixers be utilised. Any spills must be immediately contained and isolated from	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Construction	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring. Inspection of service records.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) - quarterly Quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory Workshop Manager

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			the natural environment, before being removed from site						
		Increased dust, PM10 & PM2.5	Demarcate the construction footprint and laydown area. Limit construction and vegetation clearance activities to this area. Areas that have been disturbed but will not undergo development must be revegetated with indigenous vegetation. A water cart will be used to spray gravel roads and relevant areas when dust levels are high. Speed limits will be established to minimise dust generation.	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Planning & Construction Phase	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist
		Deterioration in visual aesthetics	Demarcate the construction footprint and laydown area. Limit construction activities to this area. After construction activities are completed, all areas no longer required for operations will be fully rehabilitated.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Planning & Construction Phase	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
		Increase in environmental noise levels due to construction activities - day time	All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including noise. Implement a line of communication (i.e. helpline where complaints can be lodged). Investigate any reasonable and valid noise complaint if registered by a receptor within 2,000m. Feedback must be provided to the affected stakeholder(s) with steps taken to mitigate the impact (if valid complaint) or preventative steps to minimise the this from happening again.	Minimise the generation of nuisance noises and address complaints where possible. The operation may not increase the existing ambient sound levels by more 7dB at dwellings used for residential purposes (a disturbing noise and prohibited by the South African Noise Control Regulations).	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Planning and Construction Phase	Inspect Complaints register. Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11. EMPr Compliance Audit.	Weekly. Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction. Annually.	Environmental Manager External Consultant/Specialist External Auditor
		Increase in environmental noise levels due to construction activities - night time	If possible, locate vent shaft 1 (eastern most shaft) further than 800m from the closest NSR, OR use available material (such as topsoil) to construct a berm between the active raise-bore drilling activities and NSR08 and NSR11. This berm should be as high as possible (at least 2m higher than the drivetrain of the compressor / drilling machine, to maximum height of 4m). Discuss drilling activities with the receptors at NSR08 and NSR11, highlighting the expected noise levels as well as the duration of the drilling activities.	Ensure that night-time noise levels are less than 45dBA at all potential NSR at night-time. Night-time noise levels must be less than 60 dBA at the boundary of the mine.	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Planning and Construction Phase	Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11.	Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction.	External Consultant/Specialist
8	Operation of vent shafts & fans	Potential for increased stormwater runoff leading to Increased erosion and sedimentation.	Ensure proper storm water management is in place and operated in terms of GN 704. Regularly clean drains. Landscape and re-vegetate all denuded areas as soon as possible.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			Avoid excessive compaction of the ground.						External Specialist/Ecologist
		Increase in environmental noise levels due to operation of the ventilation fan - day time	No specific mitigation required.	Minimise the generation of nuisance noises and address complaints where possible. The operation may not increase the existing ambient sound levels by more 7dB at dwellings used for residential purposes (a disturbing noise and prohibited by the South African Noise Control Regulations).	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Throughout LoM	Inspect Complaints register. Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11. EMPr Compliance Audit.	Weekly. Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction. Annually.	Environmental Manager External Consultant/Specialist External Auditor
		Increase in environmental noise levels due to operation of the ventilation fan - night time	Install a fan that has a total sound power emission level of less than 110 dBA (re 1 pW). Alternatively fit attenuators to the ventilation system to ensure this noise emission level. Point the fan away from the closest NSR.	Ensure that night-time noise levels are less than 45dBA at all potential NSR at night-time. Night-time noise levels must be less than 60 dBA at the boundary of the mine.	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Planning and Construction Phase	Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11.	Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction.	External Consultant/Specialist
9	Underground mining (incl. dewatering for the safe continuation of mining)	Impact on global climate change due to fugitive GHG emissions	Investigate and implement technologies, if found to be feasible, which would contribute towards combatting CH_4 emissions from coal mining operations (examples of possible technologies are listed in Appendix F 1).	Reduce the combined GHG emissions. Target of 5% per annum.	General duty of care in terms of NEMA Compliance with NEMAQA and NGERs	Throughout LoM	Measure and report on GHG emissions as per NGERs	Annually	Environmental Manager/External Consultant
		Alteration of geological nature and sequence	No mitigation possible. This is the nature of mining.	No mitigation possible. This is the nature of mining.	-	-	-	-	-
		Alteration of topography and hydrological characteristics through potential subsidence	No high extraction mining proposed. Carry out a detailed investigation to determine the stability and rock engineering factors. Apply reasonable mining techniques with appropriate safety factors as per the Rock Engineer's Report. Should cracks be identified on surface, these are to be filled and rehabilitated. Should subsidence occur, these areas should be profiled and made free-draining.	Measures aim to reduce the potential for roof / pillar failure and surface subsidence.	General duty of care in terms of NEMA. Compliance with CARA, NWA and GN 704. MHSA with regards to pillar safety.	Operational	Survey the mine area for subsidence using satellite imagery or physical surveying techniques. EMPr Compliance Audit.	Annually	Mine Engineer / Rock Mechanic External Auditor
		Altered hydrological regime due to dewatering	Flow meters to be installed on the dewatering point. Routinely refine, update and validate the conceptual and numerical models by incorporating ongoing monitoring data. In addition, such a model should take into consideration the stipulated RQO's flows for the nearest downstream node.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	EMPr & IWUL Compliance Audit. Update Groundwater Model.	Annually Every 3 years	Environmental Manager & External Auditor Geohydrologist

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		Cone of depression as a result of active dewatering activities - groundwater quantity	The localised dewatering of the deep aquifer cannot be prevented. If the impact is confirmed by monitoring, impacts to the surrounding water user's supply must be mitigated by providing an alternative reliable, clean water supply.	Ensure that surrounding water users have access to a reliable and clean water supply.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Operational	Inspections of surface concrete work to ensure any ingress of rainwater into the ventilation shaft is prevented Groundwater Monitoring (incl. incl. dipping of levels) Update groundwater model	Monthly Quarterly Every 3 years	Environmental Manager Independent Laboratory Geohydrologist
		Impacts on groundwater quality due to poor quality seepage from the mining area	Maintain water pumped from the underground in a closed circuit Dirty water to be prioritised for re-use as process water PCDs to be lined and operated in accordance with GN 704 Groundwater monitoring programme to be reviewed annually by a professional geohydrologist Should environmentally unacceptable concentrations of constituents of concern be identified during monitoring of the seepage plume, hydraulic plume containment should be initiated.	Prevent groundwater quality deterioration	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Operational	Visual inspections of water containment facilities Groundwater Monitoring (incl. incl. dipping of levels) Update groundwater model	Weekly Quarterly Every 3 years	Environmental Manager Independent Laboratory Geohydrologist
		Loss of and disturbance to archaeological, palaeontological and heritage sites	All graves and heritage sites to be demarcated on surface. Should any graves/fossils/archaeological artefacts be unearthed, all work must stop and the chance find procedure implemented. ll employees and contractors should receive Health and Safety induction which must include an environmental awareness component, which must include information on the chance find protocol.	Ensure preservation of graves, heritage sites and fossils.	Compliance with the NHRA. General Duty of Care in terms of NEMA.	Planning & Construction Phase	Visual inspections of all identified graves. EMPr compliance audit. Remediation as and when needed.	Quarterly while mining is occurring beneath the sites Annually	Environmental Manager External Auditor
		Annexation of Prospecting Rights will extend the LoM by an additional 11 years, thus resulting in continued employment for the current workforce	Although the project is not expected to result in any new job opportunities, the extended LoM will result in the continued employment of mine personnel. Implement the approved Social and Labour Plan. Manage job-seeker expectations and ensure clear communication.	Ensure positive socio-economic impacts are maximised.	Compliance with the S&LP and Mining Charter.	Operational	S&LP Audit	Annually or as required by the Mining Charter	Human Resources
10	Coal handling and stockpiling incl. conveyances and the beneficiation process (operation of the plant)	Soil pollution as a result of irresponsible handling of coal or generation of coal dust, coal spillages and coal dust deposition	Dust management measures, such as spraying with water, mist aerosoling, must be considered at the coal processing and storage areas. Trucks transporting coal must not be overloaded and must be covered. Conveyor to be covered with dog housing.	Protect the soil physical and chemical properties as far as possible.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			All coal spillages around site and along conveyors and/or roads must be cleared and placed in designated coal handling areas.						
		Potential for increased stormwater runoff leading to Increased erosion and sedimentation	Ensure proper storm water management is in place and operated in terms of GN 704. Release only clean water into the environment. Stormwater leaving the site should not be concentrated in a single exit drain but spread across multiple drains around the site each fitted with energy dissipaters (e.g. slabs of concrete with rocks cemented in). Dirty water to be contained on site within the PCDs and prioritised for re-use. Regularly clean drains. Landscape and re-vegetate all denuded areas as soon as possible. Minimise the extent of concreted / paved / gravel areas.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist
		Potential for increased contaminants entering the wetland systems	Machines to be parked at a hard park area. All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Servicing of vehicles and machinery is only permitted within designated workshop areas. Drip trays to be placed under any leaky vehicles or machinery. Store all chemicals and hydrocarbons in designated and sufficiently bunded areas (110% capacity if roofed, and 120% if not roofed). Access to these areas will be restricted to those personnel who have received training in the storage and handling of hazardous substances, and the emergency clean-up procedure. Spill kits to be provided at all areas where hydrocarbons, chemicals etc are stored and/or handled and site personnel trained on the use thereof. All spills must be report to the Environmental Manager and cleaned up immediately. All contaminated soil / yard stone shall be treated *in situ* or removed and be placed in containers for disposal at an appropriately licensed site. No dirty water is permitted to be discharged into the neighbouring wetlands.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring. Inspection of service records.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) – quarterly Quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory Workshop Manager

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Impacts on water quality due to poor quality seepage and runoff from the coal handling and stockpile areas	Ensure proper storm water management is in place and operated in terms of GN 704. Dirty water to be contained on site within the PCDs and prioritised for re-use. PCDs and dirty water drains to be lined. Regularly clean drains. Storm water management features must be maintained on an on-going basis and all structures kept clear of obstructions.	To implement measures to prevent the contamination of surface and groundwater resources.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring..	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) - quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory
		Increased dust, PM10 & PM2.5	Reduce height of material transfer where possible (e.g. conveyor transfer points). Partial or full enclosure of conveyor material transfer points. Dust management measures, such as spraying with water, mist-aerosoling, must be considered at the coal processing and storage areas. Conveyor to be covered with dog housing. Regular maintenance of plant equipment, including dust suppression equipment such as sprayers, to ensure these are operating correctly. All coal spillages around site and along conveyors and/or roads must be cleared and placed in designated coal handling areas.	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Construction & Operational Phase	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist
		Increase in environmental noise levels due to numerous, simultaneous operational activities	All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including noise. Implement a line of communication (i.e. helpline where complaints can be lodged). Investigate any reasonable and valid noise complaint if registered by a receptor within 2,000m. Feedback must be provided to the affected stakeholder(s) with steps taken to mitigate the impact (if valid complaint) or preventative steps to minimise this from happening again. Investigate the use of white-noise alarms instead of tonal reverse alarms on heavy vehicles operating on roads, within the mining area and at the plant and stockpile areas.	Minimise the generation of nuisance noises and address complaints where possible. The operation may not increase the existing ambient sound levels by more 7dB at dwellings used for residential purposes (a disturbing noise and prohibited by the South African Noise Control Regulations).	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Throughout LoM	Inspect Complaints register. Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11. EMPr Compliance Audit.	Weekly. Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction. Annually.	Environmental Manager External Consultant/Specialist External Auditor
11	Mine residue handling and disposal: discard and slurry will be disposed of onto the existing, licensed discard dump	Potential for spontaneous combustion and associated emissions	The sides of the discard dump are to be continuously be cladded, especially sides exposed to wind. These measures should reduce the risk of spontaneous combustion. Where spontaneous combustion takes place, fine subsoil material will be used to	Minimise gaseous emissions into the atmosphere.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Operational Phase	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			cover the surface and this must be compacted to douse the combustion.						
		Impacts on water quality due to poor quality seepage and uncontrolled runoff	Discard dump to be constructed in accordance with the approved designs. Should poor quality seepage be noted at downstream environments through the water quality monitoring a cut-off trench can be constructed to capture poor quality seepage and this will either be channelled directly to the PCDs, or alternatively to a sump fitted with a pump to pump the water to the PCD. PCDs 6 and 7 to remain on decommissioning to manage water from the discard dump.	To implement measures to prevent the contamination of surface and groundwater resources.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring. Water Monitoring..	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season) Surface water – Monthly Groundwater (incl. levels) - quarterly	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist External Laboratory
12	Installation and operation of the slurry pipeline	Environmental pollution due to potential leaks	Pipelines should be laid within the dirty water footprint area or paddocks must be established in clean water area which will serve to contain any leaks. Pipelines should be tested with clean water to ensure no leaks before allowing piping of slurry. Additional containment measures must be provided at river crossings, such as placing pipelines within drains that drain into sumps or other acceptable containment infrastructure. Pipelines should have a series of shut-off valves which can prevent flow of contaminated water should leaks occur. Inspect, maintain and repair pipelines and pumps. Follow emergency response plan for spills. Keep back-up pumps and pipes on site.	Protect the biophysical environment as far as possible, and limit the potential for environmental degradation.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
13	Installation and operation of water reticulation pipelines	Environmental pollution due to potential leaks	Pipelines should be laid within the dirty water footprint area or paddocks must be established in clean water area which will serve to contain any leaks. Pipelines should be tested with clean water to ensure no leaks before allowing piping of slurry. Additional containment measures must be provided at river crossings, such as placing pipelines within drains that drain into sumps or other acceptable containment infrastructure. Pipelines should have a series of shut-off valves which can prevent flow of contaminated water should leaks occur. Inspect, maintain and repair pipelines and pumps. Follow emergency response plan for spills.	Protect the biophysical environment as far as possible, and limit the potential for environmental degradation.	CARA and NEMA Regulations regarding the remediation of soil. General duty of care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			Keep back-up pumps and pipes on site.						
14	Installation and operation of electricity distribution infrastructure	Destruction of SCC	Sign-off of all powerline routes to be obtained from the Environmental Manager and Land Owner prior to use. All routes must be walked through at least once, by a registered Ecologist, prior to any activities commencing. A search and rescue plan must be developed and executed to relocate plant species of conservation concern (that should be confirmed through a site visit in September) into the on-site relocation areas already used for transplantation of rescued plants or if not available, then to similar habitat recommended by a specialist.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA. Mpumalanga Nature Conservation Act (Act No. 10 of 1998).	Planning Phase	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Loss of and disturbance to archaeological, palaeontological and heritage sites	All graves and heritage sites to be demarcated. 50m buffer zone to be implemented. A heritage specialist must be appointed to compile a site preservation management plan. All vehicles and personnel must make use of existing routes/roads as far as possible. All routes must be walked through at least once prior to any activities commencing on site, to ensure no graves were missed during the HIA. Should any graves/fossils/archaeological artefacts be unearthed, all work must stop and the chance find procedure implemented. All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including information on the chance find protocol.	Ensure preservation of graves, heritage sites and fossils.	Compliance with the NHRA. General Duty of Care in terms of NEMA.	Planning & Construction Phase	Visual inspections of all identified graves. EMPr compliance audit. Remediation as and when needed.	Quarterly while mining is occurring beneath the sites Annually	Environmental Manager External Auditor
		Deterioration in visual aesthetics	Follow existing powerline routes as far as possible.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Planning & Construction Phase	-	-	-

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
15	Refuse and waste management	Potential contamination through littering and/or incorrect waste disposal	Provide adequate number of waste bins on site. Enable the separation of hazardous and general waste at source by providing separate colour-coded or labelled bins in appropriate areas. Bins and skips must be covered to prevent windblown litter, The hazardous waste storage area or skip must be established on a hard standing area. Ensure that waste manifest documentation (as per the draft Classification and Management Regulations, GNR.614 of 2012) is prepared and maintained for the generation, transportation and disposal of all waste streams. Ensure that waste receptacles are regularly collected by reputable service providers for proper recycling or disposal (as appropriate). All contractors and site personnel must undergo induction and environmental awareness training. Which training must include littering and waste management.	To ensure the correct handling, storage, transportation and disposal of waste.	General duty of Care in terms of NEMA. Compliance with NEMWA and the Norms and Standards for the storage and handling of waste.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
		Deterioration in visual aesthetics	Designated waste area must be established with the placement of skips to contain various waste streams. Provide adequate number of waste bins on site. Enable the separation of hazardous and general waste at source by providing separate colour-coded or labelled bins in appropriate areas. Bins and skips must be covered to prevent windblown litter, All contractors and site personnel must undergo induction and environmental awareness training. Which training must include littering and waste management.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
		Potential for pests and vermin	Practise good housekeeping. Designated waste area must be established with the placement of skips to contain various waste streams. Provide adequate number of waste bins on site. Enable the separation of hazardous and general waste at source by providing separate colour-coded or labelled bins in appropriate areas. Bins and skips must be covered. Maximum domestic waste storage period will be 10 days. A pest control plan must be put in place and implemented; it is imperative that	To ensure that the negative socio-economic impacts are mitigated and managed.	Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well as the Basic Conditions of Employment Act.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			poisons not be used to control pests due to the likely presence of SCC						
		Potential contamination of surrounding environment with sewage	Ensure portable, chemical toilets are provided in all construction areas, and that these are regularly serviced by reputable contractors. All laydown areas, chemical toilets etc. should be restricted to existing areas of transformation, where possible. Portable toilets must be supplied at the ratio as provided in the Health and Safety Act. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.	To ensure the correct handling, storage, transportation and disposal of waste.	General duty of Care in terms of NEMA. Compliance with NEMWA and the Norms and Standards for the storage and handling of waste. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
		Exposure to potentially hazardous materials, waste and malodours	Designated waste area must be established with the placement of skips to contain various waste streams. Provide adequate number of waste bins on site. Enable the separation of hazardous and general waste at source by providing separate colour-coded or labelled bins in appropriate areas. Bins and skips must be covered. All contractors and site personnel must undergo induction and environmental awareness training. Which training must include littering and waste management.	Limit occupation hazards and potential for incidences.	Operations will comply with MHSA, Occupational Health and Safety Act, and all relevant Regulations as well as the Basic Conditions of Employment Act.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
16	Maintenance and operation of existing Mine infrastructure and facilities	Impact on global climate change due to GHG emissions	Prepare and implement an energy and GHG Management Plan to assist in analysing and identifying opportunities to reduce energy consumption; GHG emissions; and offset opportunities. This Plan should be updated regularly to ensure with applicable policies and legislation. As far as possible, use solar and/or wind-powered electricity instead of Eskom purchased electricity and diesel fuelled generators.	Reduce the combined GHG emissions. Target of 5% per annum.	General duty of care in terms of NEMA. Compliance with NEMAQA and NGERs	Throughout LoM	Measure and report on GHG emissions as per NGERs.	Annually	Environmental Manager/External Consultant
		Continued fragmentation and degradation of ecosystems	All areas of increased ecological sensitivity outside of the approved development footprints are to be designated as "No-Go" areas and be off-limits to all unauthorised vehicles and personnel. Dust suppression to be undertaken in all construction areas, this includes wetting of exposed soft soil surfaces and the use of environmentally friendly dust suppressant products (if required).	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr Compliance Audit. Dust Fallout Monitoring.	Weekly Annually Monthly	Environmental Manager External Auditor External Consultant/Specialist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Spread or establishment of alien invasive species	Implement the alien management plan, which must highlight control priorities and areas and provide a programme for long-term control. Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures based on monitoring results to enable adaptive management in terms of alien invasive plant control.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and CARA	Throughout LoM	Visual inspections. EMPr Compliance Audit. Review of Training / Induction Programme.	Monthly Annually Annually	Environmental Manager External Auditor SHE Officer & Environmental Manager
		Erosion and resulting loss of vegetation communities	Ensure proper storm water management is in place prior to construction. Only strip vegetation as necessary. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there. Vegetate soil stockpiles. Revegetate all denuded areas as soon as possible.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Throughout LoM. Remediation as required.	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light)	All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. Speed limits must still be enforced to ensure that road killings and erosion is limited. No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Monthly Annually	Environmental Manager External Auditor
17	Storage and use of dangerous goods / Hazardous Substances	Environmental pollution due to hydrocarbon/chemical contamination into the natural environment.	Machines to be parked at a hard park area. Drip trays to be placed under any leaky vehicles or machinery. All vehicles and machinery must be maintained and regularly serviced in accordance with the manufacturers guidelines. Servicing of vehicles and machinery is only permitted within designated workshop areas. Spill kits to be provided at all areas where hydrocarbons, chemicals etc are stored and/or handled and site personnel trained on the use thereof.	To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste.	Compliance with the Hazardous Substances Act, 1973 (Act No 15 of 1973) General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr Compliance Audit.	Weekly Annually	Environmental Manager External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			All spills must be report to the Environmental Manager and cleaned up immediately. All contaminated soil / yard stone shall be treated *in situ* or removed and be placed in containers for disposal at an appropriately licensed site. Store all chemicals and hydrocarbons in designated and sufficiently bunded areas (110% capacity if roofed, and 120% if not roofed. Refuelling areas to be located on a hard surface to prevent soil and groundwater contamination. Securely fence and lock the storage areas that accommodate hazardous substances such as fuel, oils and chemicals. Access to these areas will be restricted to those personnel who have received training in the storage and handling of hazardous substances, and the emergency clean-up procedure. Bund areas to be fitted with an outflow valve and oil trap. Contaminated water to be drained under controlled circumstances only. Maintain oil traps or interceptors on a regular basis and maintain records. Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills						
18	Operation and maintenance of the existing stormwater management system	Reduction in catchment yield due to containment of dirty water on site	Dirty water footprint to be maintained as small as possible. All clean water to be diverted around site. SWMP must be adhered to throughout the project.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit.	Weekly Annually	Environmental Manager External Auditor
		Potential for poor quality water impacting on groundwater and/or surface water and wetlands if pipelines or dams/trenches burst, spill or leak.	Ensure proper storm water management is in place and operated in terms of GN 704. Dirty water to be contained on site within the PCDs and prioritised for re-use. PCDs and dirty water drains to be lined. As a preventative measure, all water containment facilities should be operated with a freeboard of at least 0.8 m. Regularly clean drains. Storm water management features must be maintained on an on-going basis and all structures kept clear of obstructions.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Throughout LoM	Visual inspections. EMPr & IWUL Compliance Audit. Water Monitoring.	Weekly Annually Surface water – monthly Groundwater (incl. levels) - quarterly	Environmental Manager External Auditor External Laboratory
19	Water use	Irresponsible use of water and water wastage.	Saving water initiatives to be included in the environmental awareness training.	Conserve and safe water.	General duty of Care in terms of NEMA.	Throughout LoM	Review of Training / Induction Programme.	Annually Annually	SHE Officer & Environmental Manager

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
			Utilise water on site responsibly. Water use at the Mine must be measured and recorded. Inspect all water management facilities and pipelines for leakages and immediately repair.		Compliance with NWA and GN 704.		IWUL Compliance Audit.		Environmental Manager & External Auditor
20	Sealing and closure of underground portal. Backfilling of boxcut adit. Removal of surface infrastructure and general rehabilitation. Decommissioning and Closure of Mine	Profiling and restoration of free drainage	Positive impact - no mitigation necessary.	Ensure successful rehabilitation. Return surface water runoff to the catchment.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	-	-	-	-
		Potential loss or degradation of nearby wetlands through inappropriate closure	Develop and implement a rehabilitation and closure plan. Appropriately rehabilitate the project area by ripping, landscaping and re-vegetating with locally indigenous species. Restrict all activities to within the disturbed footprint area. Educate staff and relevant contractors on the location and importance of the identified wetlands through toolbox talks and by including them in site inductions as well as the overall master plan (indicating no-go areas). No vehicles or heavy machinery will be allowed to drive indiscriminately within any wetland areas or their buffer areas. All vehicles must remain on demarcated roads.	To ensure protection of water resources and continued functioning of aquatic ecosystems.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Decommissioning	Visual inspections. EMPr compliance audit. Wetland Monitoring.	Weekly Annually Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist
		Increased runoff and erosion ultimately resulting in loss of vegetation communities, and leading to the sedimentation of downstream water resources	Ensure proper storm water management is in place prior to construction. Only strip vegetation as necessary. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there. Vegetate soil stockpiles. Revegetate all denuded areas as soon as possible.	Prevent erosion from occurring, thereby preventing loss of soil, vegetation communities and siltation of downstream water bodies.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Decommissioning	Visual inspections. EMPr & IWUL Compliance Audit. Aquatic Biomonitoring. Wetland Monitoring.	Weekly Annually Bi-Annually (Low & High Flow) Annually (in peak growing season)	Environmental Manager External Auditor External Specialist/Ecologist External Specialist/Ecologist
		Continued fragmentation and degradation of ecosystems	All areas of increased ecological sensitivity outside of the approved development footprints are to be designated as "No-Go" areas and be off-limits to all unauthorised vehicles and personnel. Dust suppression to be undertaken in all construction areas, this includes wetting of exposed soft soil surfaces and the use of environmentally friendly dust suppressant products (if required).	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Decommissioning	Visual inspections. EMPr compliance audit. Dust fallout monitoring.	Weekly Annually Monthly	Environmental Manager External Auditor External Consultant/Specialist

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Spread or establishment of alien invasive species	Implement the alien management plan, which must highlight control priorities and areas and provide a programme for long-term control. Progressive rehabilitation of areas that have been cleared of invasive plants will enable topsoil to be returned more rapidly, thus ensuring more recruitment from the existing seedbank. Undertake regular monitoring to detect alien invasions early so that they can be controlled. Implement control measures based on monitoring results to enable adaptive management in terms of alien invasive plant control.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and CARA	Decommissioning	Visual inspections. EMPr compliance audit. Remediation as required.	Weekly Annually	Environmental Manager External Auditor
		Ongoing displacement and direct mortalities of faunal community due to disturbance (road collisions, noise, light)	All outside lighting should be directed away from highly sensitive areas. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (green/red) lights should be used wherever possible. Speed limits must still be enforced to ensure that road killings and erosion is limited. No trapping, killing, or poisoning of any wildlife is to be permitted and must be made a punishable offense.	To prevent, wherever possible, impacts to intact terrestrial ecosystems and protected species.	Compliance with NEMBA and associated regulations. General duty of care in terms of NEMA.	Decommissioning	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor
		Increased dust, PM10 & PM2.5	Revegetate bare areas as soon as possible. A water cart will be used to spray gravel roads and relevant areas when dust levels are high. Speed limits will be established to minimise dust generation.	Minimise emissions from vehicles and machinery on site. Minimise nuisance dust.	NEMA General Duty of Care. Compliance with NEMAQA and its Regulations.	Decommissioning	Visual inspections. EMPr Compliance Audit. Dust fallout monitoring. Reporting on PM10 & PM2.5 via NAEIS.	Weekly Annually Monthly Annually	Environmental Manager External Auditor External Consultant / Specialist
		Increase in environmental noise levels decommissioning and rehabilitation activities	All employees and contractors should receive Health and Safety induction which must include an environmental awareness component, including noise. Implement a line of communication (i.e. helpline where complaints can be lodged). Investigate any reasonable and valid noise complaint if registered by a receptor within 2,000m. Feedback must be provided to the affected stakeholder(s) with steps taken to mitigate the impact (if valid complaint) or preventative steps to minimise this from happening again. Investigate the use of white-noise alarms instead of tonal reverse alarms on heavy vehicles operating on roads, within the mining area and at the plant and stockpile areas. Minimise active night-time activities within 600m from verified NSR.	Minimise the generation of nuisance noises and address complaints where possible. The operation may not increase the existing ambient sound levels by more 7dB at dwellings used for residential purposes (a disturbing noise and prohibited by the South African Noise Control Regulations).	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Throughout LoM	Inspect Complaints register. Ambient noise monitoring at NSR04/05, NSR08, NSR09 and NSR11. EMPr Compliance Audit.	Weekly. Ambient noise monitoring to be undertaken Quarterly prior to construction to develop a baseline, and continue Quarterly during construction. Annually.	Environmental Manager External Consultant/Specialist External Auditor

No	Activity	Impact / Risk Description	Mitigation Measures / Management Actions	Impact Management Outcome	Compliance with Standard	Time Period for Implementation of Mitigation Measure	Monitoring Specification	Monitoring Frequency	Person(s) Responsible for Monitoring
		Retrenchment/loss of employment and procurement opportunities	Before closure, communicate with employees the downscaling process to manage expectations. Assist with reference letters etc. where possible. Implement the S&LP.	To ensure that the negative socio-economic impacts are mitigated and managed.	Compliance with the S&LP and Mining Charter.	Decommissioning	S&LP Audit	Annually or as required by the Mining Charter	Human Resources
		Void recharge and potential for decant	Update the groundwater model following the completion of the mining activities. Seal the underground portal and all exploration boreholes Rehabilitate all high recharge footprints as soon as possible Minimise recharge of rainwater into underground voids by creating free draining slopes, no ponding should be allowed Installation and testing of additional groundwater monitoring boreholes within the underground mine voids to monitor rebounding water levels. Monitor water levels of the underground aquifer created so that emergency decant procedures can be put in place. This could include pumping to keep water levels below decant level Should decant occur this water should be treated prior to discharge	Minimise seepage and prevent groundwater quality deterioration Prevent or manage decant should it occur.	General duty of Care in terms of NEMA. Compliance with NWA and GN 704.	Decommissioning	Visual inspections. EMPr Compliance. Groundwater Monitoring (incl. incl. dipping of levels). Update groundwater model. Water Monitoring.	Weekly Quarterly Annually Once-off Surface-water – monthly Groundwater (incl. levels) - quarterly	Environmental Manager External Auditor Geohydrologist Independent Laboratory
		Soil replacement, amelioration and seeding. Vegetative cover and plant community succession. Influx of Animals to the area once vegetation establishes.	Positive impact - no mitigation necessary.	Ensure successful rehabilitation.	General duty of Care in terms of NEMA. Compliance with ECA and the Noise Control Regulations (GN R154). Monitoring in accordance with SANS 10103:2008.	Decommissioning	Soil Fertility Analysis	Annually during the decommissioning period	Soil specialist
		Improvement in visual aesthetics	Rehabilitate disturbed areas as soon as possible.	Limit the visual impacts on surrounding land users. Maintain the construction areas to be as visually unobtrusive as possible.	General duty of care in terms of NEMA.	Decommissioning	Visual inspections. EMPr compliance audit.	Weekly Annually	Environmental Manager External Auditor

10 MONITORING & REPORTING REQUIREMENTS

This section of the report contains the monitoring, auditing and reporting requirements relevant to the mine.

Table 11 contains a summary of the monitoring plans that must be implemented and identifies the person responsible for undertaking the audit / monitoring and the frequency of each monitoring / auditing and reporting exercise.

All monitoring that requires the analysis of laboratory results must only be associated with SANAS accredited laboratories. Post closure monitoring is recommended for a period of 3 years.

Table 11: Monitoring, Auditing and Reporting Summary

Impact that requires monitoring	Monitoring description	Person responsible for monitoring	Frequency of monitoring	Reporting requirements
General compliance – all EMPr commitments	Visual inspections of operational areas	Environmental Manager	Weekly	Internal
	Internal Compliance Reports	Environmental Manager	Monthly	Internal – maintain register
	External Regulation 34 Audits	Independent External Auditor	Annually (or as stipulated in the Environmental Authorisation)	DMRE (note: registered I&APs must be notified of the reports availability, in addition the report should be published on the company website)
	Quantum for Financial Provision	External consultant Independent External Auditor	Annually	DMRE
Graves and heritage sites	Visual inspections of the graves	Environmental Manager	Quarterly while mining is occurring beneath the sites	Internal – maintain register
Hazardous excavations and structures	Visual inspections to ensure that safety measures including barriers, fencing etc. are in place.	SHE Officer	Weekly	Internal
			Annually	Mine Health & Safety

Impact that requires monitoring	Monitoring description	Person responsible for monitoring	Frequency of monitoring	Reporting requirements
Pillar failure, surface subsidence and / or cracking	Survey the mine area for subsidence using satellite imagery and/or physical surveying techniques	Strata Control Officer and Rock Engineer	Annually	Mine Health & Safety
Physical destruction and general disturbance of biodiversity	Visual inspections to ensure that EMPr commitments with respect to biodiversity are complied with.	Environmental Manager	Weekly	Internal
	Visual inspections of rehabilitated areas for erosion and vegetation succession.	Environmental Manager	Monthly during the LoM Annually for 3 years post-closure or as recommended by a Specialist	Internal
		Independent External Auditor	Annually	Report to DMRE (EMPr Compliance)
	Monitoring the establishment and spread of Alien Invasive Plant Species.	Environmental Manager	Monthly	Internal
		External consultant	Annually	Report to DMRE (Financial Provision & EMPr Compliance)
Deterioration of soil quality or loss of soils	Visual inspections to ensure that EMPr commitments with respect to soils, land use and land capability are complied with.	Environmental Manager	Weekly	Internal
	Visual inspections of rehabilitated areas for compaction, fertility, and erosion.	Environmental Manager	Monthly during the LoM Annually for 3 years post-closure or as recommended by a Specialist	Internal
	Fertility testing of soils on rehabilitated areas	Independent Specialist	Annually during the dry season	Report to DMRE (EMPr Compliance)

Impact that requires monitoring	Monitoring description		Person responsible for monitoring	Frequency of monitoring	Reporting requirements
Impacts on quality and quantity of water resources	Aquatic Biomonitoring.		Independent Specialist	Bi-annually (wet & Dry season)	Annual Report to DWS or as stipulated in the Water Use License (IWUL)
	Wetland Monitoring		Independent Specialist	Annually (peak of growing season i.e. January)	
	Surface and Groundwater Monitoring.	Surface Water quality samples	Independent Laboratory	Monthly	Annual Report to DWS or as stipulated in the Water Use License (IWUL)
		Groundwater quality and quantity (dipping of borehole levels)	Independent Laboratory	Quarterly	
	Surface and Groundwater Quantity	Update operational water balance	Engineer	Quarterly	
	Groundwater Model.	Update the Numerical Model with monitoring data	Geohydrologist	Every 3 years	
Increase in emissions	Dust monitoring programme.		Environmental Manager/External consultant	Monthly	If dust fallout rates are exceeded report to the Municipal Air Quality Officer Annual Reports to DMRE (EMPr Compliance)
	Greenhouse Gas (GHG)		Environmental Manager/External consultant	Annual reporting during operations	Annual Reporting to the South African Greenhouse Gas Emissions Reporting System (SAGERS).

Impact that requires monitoring	Monitoring description	Person responsible for monitoring	Frequency of monitoring	Reporting requirements
	PM_{10} and $PM_{2.5}$ Reporting	Environmental Manager/External consultant	Annual reporting during operations	Annual Reporting to the National Atmospheric Emissions Inventory System (NAEIS.)
Increase in noise levels	Occupational noise monitoring plan.	SHE Officer/ Independent Specialist	Monthly during operations	Internal
	Environmental noise monitoring	Independent Specialist	Quarterly prior to and during construction of the ventilation shafts to establish a baseline Bi-Annually during Operations	Annual Reports to DMRE (EMPr Compliance)
Mine residue facilities / pollution control dams	All mine residue facilities and PCDs must be monitored to ensure stability, safety and prevention of environmental impacts.	Environmental Manager	Monthly	Internal inspections of water levels
		SHE Officer & Independent Engineer	Annually	Internal / Mine Health & Safety

10.1 Specific Monitoring Plans

10.1.1 Surface Water and Groundwater Monitoring

Forzando Coal Mines (Pty) Ltd currently undertakes water monitoring at its operations. The surface water monitoring network comprises twenty two (22) sites, including in-stream monitoring locations, mine water containment facilities, treated sewage effluent and potable drinking water sources (see Plan 11 and Table 12).

The groundwater monitoring network currently comprises eleven (11) monitoring boreholes. It is proposed that this be expanded to include an additional twelve (12) hydrocensus points as per the recommendations of the Geohydrological Impact Assessment (Aquiscience, 2023). Refer to Plan 12 and Table 12 for details.

Surface water samples are to be taken monthly. Groundwater is to be sampled and dipped (levels) quarterly.

Quarterly monitoring reports are to be compiled and should, as a minimum, include trend analysis to differentiate seasonal variations, and comparison of water samples to the limits and constituents as set by the DWS in the approved WUL.

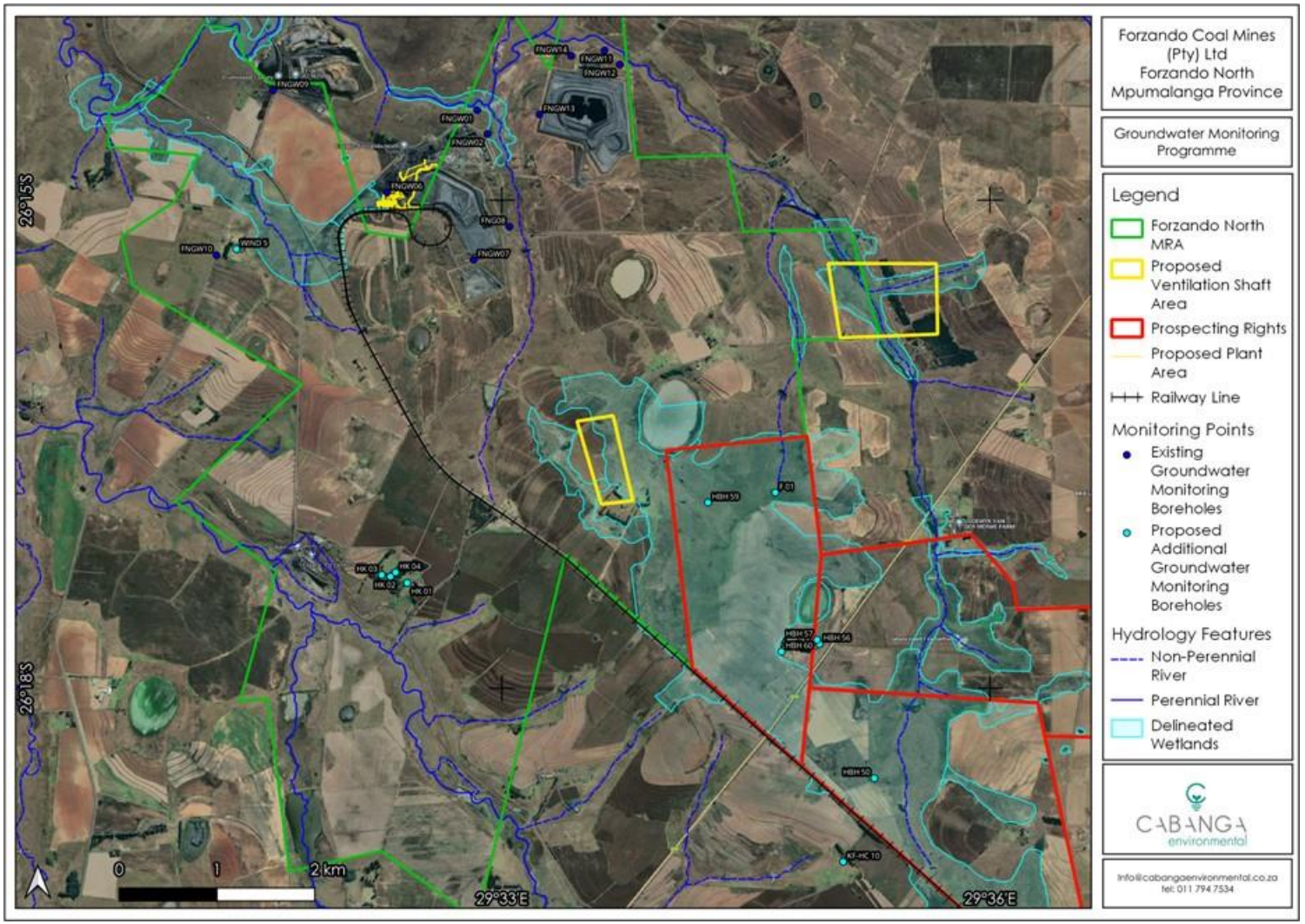
Furthermore, it is recommended that the 3D numerical model be updated every 3 years for the LoM in order to adjust for operational changes as well as improve the level of confidence in the predicted impacts.

Table 12: Water Monitoring Network

ID:	Coordinates:		Description:
SURFACE WATER MONITORING POINTS:			
FNSW01	26°15'12.46"S	29°33'6.84"E	In-stream, at the bridge – east of dump
FNSW02	26°14'24.97"S	29°32'54.31"E	Upstream, in the Olifants River
FNSW03	26°14'42.40"S	29°32'56.11"E	Seepage from Dam
FNSW04	26°14'33.90"S	29°32'59.06"E	Downstream of tributary to the Olifants River
FNSW05	26°14'21.91"S	29°32'22.27"E	Far downstream from Olifants River
FNSW06	26°14'43.80"S	29°32'52.87"E	PCD 1
FNSW07	26°15'18.68"S	29°33'7.24"E	Upstream of FNSW01
FNSW08	26°14'50.57"S	29°33'2.88"E	Downstream of FNSW01
FNSW09	26°14'40.70"S	29°32'51.29"E	PCD 2
FNSW10	26°14'39.52"S	29°32'51.72"E	PCD 3
FNSW11	26°14'32.79"S	29°32'46.87"E	PCD 4
FNSW12	26°14'39.66"S	29°32'34.01"E	PCD 5
FNSW13	26°14'49.06"S	29°34'30.92"E	Upstream of Discard Dump #3
FNSW14	26°13'59.62"S	29°33'15.92"E	Downstream of Discard Dump #3
FNSW15	26°13'34.7"S	29°34'02.4"E	Further upstream of Olifants River
FNSW16	26°13'58.85"S	29°33'13.39"E	Upstream, in Olifants River tributary
FNSW20	26°14'37.57"S	29°32'37.32"E	Treated sewage water effluent
FNSW21	26°14'46.68"S	29°32'44.77"E	Potable water (office kitchen)
FNSW22	26°14'47.18"S	29°32'51.72"E	Inflow into PCD 1
FNSW23	26°14'39.85"S	29°32'47.43"E	Big Ericksen Dam
FNSW24	26°14'6.90"S	29°33'29.02"E	PCD 6
FNSW25	26°14'40.16"S	29°32'48.13"E	Small Ericksen Dam
GROUNDWATER MONITORING POINTS:			
FNGW01	26°14'26.77"S	29°32'50.93"E	Monitoring borehole
FNGW02	26°14'35.59"S	29°32'54.74"E	Monitoring borehole
FNGW06	26°14'57.12"S	29°32'17.70"E	Monitoring borehole

ID:	Coordinates:		Description:
FNGW07	26°15'21.96"S	29°32'49.60"E	Monitoring borehole
FNGW08	26°15'9.76"S	29°33'2.84"E	Monitoring borehole
FNGW09	26°14'19.46"S	29°31'35.65"E	Monitoring borehole
FNGW10	26°15'20.23"S	29°31'14.74"E	Monitoring borehole
FNGW11	26°14'4.81"S	29°33'37.91"E	Monitoring borehole
FNGW12	26°14'10.00"S	29°33'43.56"E	Monitoring borehole
FNGW13	26°14'28.39"S	29°33'13.90"E	Monitoring borehole
FNGW14	26°14'06.7"S	29°33'25.6"E	Monitoring borehole
HBH 50	26°18'33.08"S	29°35'17.41"E	Hydrocensus/receptor borehole
HBH 56	26°17'43.58"S	29°34'57.18"E	Hydrocensus/receptor borehole
HBH 57	26°17'42.07"S	29°34'56.32"E	Hydrocensus/receptor borehole
HBH 59	26°16'51.46"S	29°34'16.03"E	Hydrocensus/receptor borehole
HBH 60	26°17'46.43"S	29°34'43.14"E	Hydrocensus/receptor borehole
HK 01	26°17'21.07"S	29°32'25.12"E	Hydrocensus/receptor borehole
HK 02	26°17'18.75"S	29°32'18.92"E	Hydrocensus/receptor borehole
HK 03	26°17'18.12"S	29°32'15.73"E	Hydrocensus/receptor borehole
HK 04	26°17'17.17"S	29°32'20.84"E	Hydrocensus/receptor borehole
KF-HC 10	26°19'3.88"S	29°35'5.90"E	Hydrocensus/receptor borehole
WIND 5	26°15'17.99"S	29°31'22.15"E	Hydrocensus/receptor borehole
F 01	26°16'47.78"S	29°34'40.87"E	Hydrocensus/receptor fountain

Plan 11: Surface Water Monitoring Plan



Plan 12: Groundwater Monitoring Plan

10.1.2 Wetland and Aquatic Biomonitoring

To ensure the prompt identification and mitigation of negative impacts, it is imperative to continue biomonitoring in the future. This should involve an analysis of seasonal variations and temporal trends, particularly if any spatial degradation is observed downstream from mining activities. Definitive toxicity testing of mine-affected water types that may be discharged and/or mine water containment facilities should also be included (Clean Stream Biological Services, 2022).

Biomonitoring locations are listed in Table 13 and depicted in Plan 13. Biomonitoring of these sites should continue bi-annually (every 6 months), once during the rainy season and once during the dry season. Although some sites may be dry over winter, the sites must still be visited and assessed where possible.

Similarly, monitoring of wetlands should be carried out throughout the LoM for impacts from the surface infrastructure. Annual monitoring should be satisfactory unless stipulated otherwise by the wetland specialist. The components for the wetland monitoring programme are summarised in Table 14.

Table 13: Biomonitoring Sites

ID:	COORDINATES:		DESCRIPTION:
FZN-1	26°15'12.96"S	29°33'6.84"E	Toxicity testing only
FZN-3	26°14'27.96"S	29°32'56.40"E	Toxicity testing only
FZN-4	26°14'1.12"S	29°33'8.72"E	Biomonitoring site
FZN-5	26°14'22.92"S	29°32'50.64"E	Biomonitoring site
FZN-6	29°32'50.64"E	29°33'45.33"E	Biomonitoring site
FZN-6B	26°14'1.31"S	29°33'22.29"E	Biomonitoring site

Table 14: Wetland Monitoring Plan (TBC, 2023b)

Variables	Methods	Monitoring Frequency	Indicator
Wetland health and ecosystem services	Conduct PES and ecosystem services assessments on HGM 1, HGM 4 and HGM 5. Monitor against the REC.	Annual (peak of growing season e.g. January) Commence at the year prior to construction of the proposed plant and ventilation shafts.	Hydrology, geomorphology and vegetation Ecosystem services assessment criteria

Plan 13: Aquatic Biomonitoring Plan

10.1.3 Dust Fallout Monitoring

Dust fallout monitoring is undertaken at Forzando North Coal Mine, at eight (8) monitoring locations on a monthly basis. It is proposed that the monitoring network be expanded to include the proposed plant, and associated stockpile expansion area. Three (3) additional dust bucket locations are proposed (Table 15 - where the green highlighted cells indicate the position of the additional proposed buckets).

Monitoring and reporting must be undertaken in accordance with NEMAQA and the National Dust Control Regulations, 2013.

Table 15: Dust Bucket Locations

ID:	Coordinates:	
T1	26°14'3.70"S	29°32'58,87"E
T2	26°15'33.34"S	29°33'16,24"E
T3	26°14'1.35"S	29°33'31,23"E
T4	26°14'55.46"S	29°32'11.27"E
T5	26°14'48.12"S	29°32'18.79"E
T6	26°14'54.05"S	29°32'27.11"E
T9	26°15'2.00"S	29°32'18.41"E
T10	26°14'30.80"S	29°32'45.30"E
T14	26°15'43.30"S	29°32'35.20"E
T15	26°14'10,2"S	29°33'46,4"E
T17	26°15'02,3"S	29°33'51,3"E

10.1.4 Environmental Noise Monitoring

The following noise monitoring is proposed as recommended in the Noise Impact Assessment (E.A.R, 2023):

- Occupational noise will be monitored by the Health and Safety Department on a monthly basis during the LoM as long as areas of elevated noise (crusher, underground drilling, etc.) are operational on site.
- Three-monthly (quarterly) environmental noise must be undertaken at residential dwellings in the area (NSR04/05, NSR08, NSR09 and NSR11 – see Plan 15) before construction/development of the ventilation shafts and proposed plant, and during construction.
- Once construction is complete, bi-annual (six-monthly) noise monitoring should continue at the same locations for the LoM.
- Measurements should be collected over a period of at least thirty-six (36) hours (two night-time periods).
- When investigating a noise complaint, noise measurements must be conducted at the location of the person that registered a valid and reasonable noise complaint (staying within 2,000 m from the project). A second instrument should be deployed at the Mine.

Ambient sound measurements should be collected as defined in SANS 10103:2008 (E.A.R, 2023).

Table 16: Proposed Environmental Noise Locations

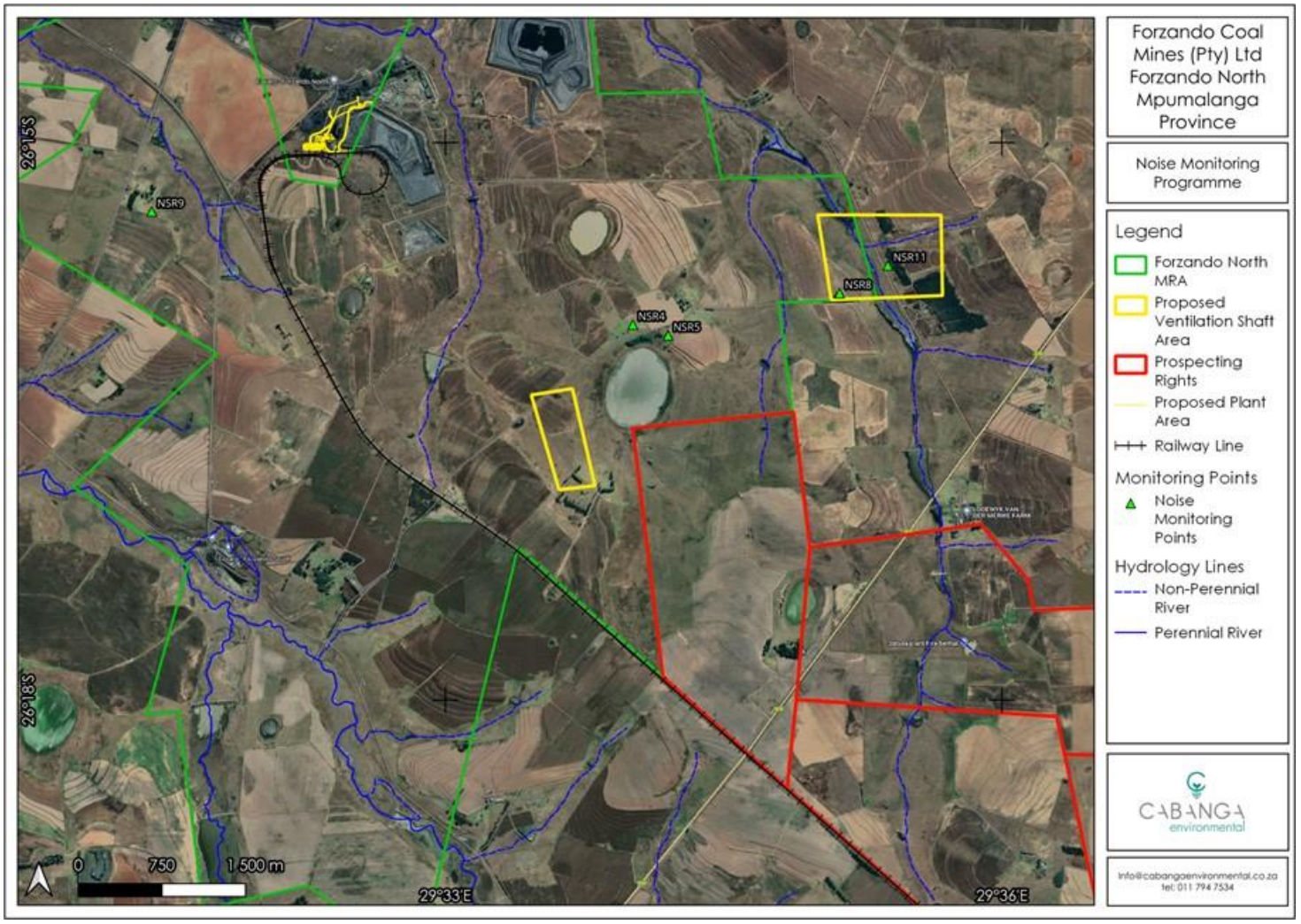
ID:	Coordinates:	
NSR4 OR NSR5	26°15'58.78"S 26°16'2.25"S	29°34'0.63"E 29°34'11.98"E
NSR8	26°15'48.65"S	29°35'7.46"E
NSR9	26°15'22.24"S	29°31'25.01"E
NSR11	26°15'39.70"S	29°35'23.08"E

10.2 Compliance Assessment & Reporting

The NEMA EIA Regulations (2014) (as amended) states that the Holder of an Environmental Authorisation must, for the period during which the Authorisation, EMPr and Closure Plan remain valid, ensure that compliance with the conditions of the approvals is audited and submit such audit report to the competent authority (in this case the DMRE).

The frequency of auditing will be provided in the Environmental Authorisation. However, it is recommended that Internal compliance inspection reports be compiled by the on-site Environmental Manager on a monthly basis and that external compliance audits against the conditions of the Environmental Authorisation and commitments in the EMPr be undertaken annually. External audits must be undertaken in accordance with Regulation 34.

Plan 14: Dust Fallout Monitoring Plan



Plan 15: Noise Monitoring Plan

11 ENVIRONMENTAL AWARENESS PLAN

Environmental awareness training is critical for two primary reasons:

1. the workforce must understand how they can play a role in achieving the objectives specified in the EMPr, and
2. the workforce must understand their obligations in terms of the implementation of the EMPr and adherence to environmental-legislative requirements.

A training needs analysis is to be performed through all levels of the organisation including those within the administration, plant, workshop and underground sectors. Each of the categories/levels of the organisation have different responsibilities and roles, accordingly different knowledge requirements are applicable.

The Training Department in conjunction with the SHE Officer and Environmental Manager are responsible for ensuring job specific training for personnel performing tasks, which can cause significant environmental and social impacts (e.g. receipt of bulk hazardous chemicals/fuel, hazardous materials handling, responding to emergency situations etc.).

The Environmental Manager responsible for environmental awareness training will keep records of the persons who attended the training sessions and these sessions must incorporate methods to test the training attendee's understanding of the subject matter presented. The Environmental Manager must, on the basis of evidence, determine that the employees are competent in the training material and learning outcomes.

Effectiveness of the environmental awareness training will be evaluated by the management through task observations and during internal and external audits. All training material for presentation to personnel and contractors will be reviewed annually to ensure consistency with organisational requirements and best practice guidelines. In addition to this, annual monitoring reports, audit results and all incident reports will be reviewed; any short comings and non-compliancy will be highlighted and management measures incorporated or improved upon within the training material.

12 EMERGENCY RESPONSE

Though every effort has been made to identify the potential impacts and risks associated with the operations and to prescribe management and mitigation measures associated with each impact, emergency situations can arise for which Mine Management has to prepare.

Procedures that the Mine has to implement in response to certain emergency events are detailed in the table below.

Table 17: Emergency Response

No	Situation	Response procedure
1	Spillage of chemicals, hydrocarbons or waste	If there is a risk of a spillage of any substance migrating outside of the dirty-water containment areas on the Mine, the Mine Management will immediately notify residents/users downstream of the pollution incident. The Mine will further identify and provide

No	Situation	Response procedure
		alternative resources should contamination impact adversely on the existing users.
		In the event of a spill occurring on site: • Cut off the source if the spill is originating from a pump, pipeline or valve and ensure the infrastructure is 'made safe'. • Contain the spill (e.g. construct temporary earth bund around source). • Pump excess hazardous liquids on the surface to temporary containers (e.g. 210 litre drums, mobile tanker, etc.) for appropriate disposal. • Remove hazardous substances from damaged infrastructure to an appropriate storage area before it is removed/repaired.
		All spill incidents must be reported to the Environmental Manager immediately, who will assess the incidents and set up an investigation team if deemed necessary.
		Reportable incidents must be reported to the DMRE, DWS and all other relevant authorities within 24 hours.
2	Discharge of dirty water to the environment (Dam Wall Failure, burst dirty water pipes / trenches, overtopping)	Turn off supply to the Dam / Pipeline.
		Dispatch necessary emergency services.
		All reasonable measures must be implemented to stop the spread of contaminated water (berms / channels can be placed around the spillage area).
		All incidents must be reported to the Environmental Manager immediately, who will assess the incident and set up an investigation team if deemed necessary.
		Reportable incidents must be reported to the DMRE, DWS and all other relevant authorities within 24 hours.
3	Pollution of surface water	Personnel discovering the incident must inform the Environmental Manager of the location and contaminant source (immediately).
		Apply the principles listed for Item 1 and 2 above.
		Absorbent brooms will be used to absorb surface spills of hydrocarbon contaminants.
		Contamination entering the surface water drainage system should be redirected into the dirty water system.
		The Environmental Manager will collect in-stream water samples downstream of the incident to assess the immediate risk of contamination.
4	Groundwater contamination	Use the groundwater monitoring boreholes as scavenger wells to pump out the polluted groundwater for re-use in the process water circuit (hence containing the contamination and preventing further migration).

No	Situation	Response procedure
		Investigate the source of contamination and implement control/mitigation measures.
5	Flooding (from failure of surface water control infrastructure and/or extreme rainfall events)	Evacuate the area downstream of the failure (if relevant).
		Using the emergency response team, rescue/recover and medically treat any injured personnel.
		Temporarily reinstate/repair storm-water diversions during the storm event (e.g. emergency supply of sandbags).
		Close the roads affected by localised flooding or where a storm-water surge has destroyed crossings/bridges.
		The use of emergency pumps should occur if the water floods the boxcut Adit.
6	Risk of drowning from falling into water dams	Attempt rescue of individuals from land.
		Get assistance of emergency response team whilst attempting rescue or to carry out rescue of animals and/or people as relevant.
		Ensure medical assistance is available to recovered individual.
		Prevent this situation by ensuring adequate access control to water containment facilities.
7	Veld fires	Report the fire to the SHE Officer and Fire Marshal.
		Evacuate mine employees (as well as contractors, visitors etc.) from areas at risk.
		Notify downwind residents and industries of the danger.
		Assist those in imminent danger/less able individuals to evacuate until danger has passed.
		Provide emergency firefighting assistance with available trained mine personnel and equipment.
8	Falling into hazardous excavations	Personnel discovering the fallen individual or animal must mobilise the emergency response team to the location of the incident and provide a general appraisal of the situation (e.g. human or animal, conscious or unconscious, etc.).
		The injured party should be recovered by trained professionals such as the mine emergency response team.
		A doctor (or appropriate medical practitioner)/ambulance should arrive at the scene to provide first aid and transport individual to hospital.
		A nearby vet should be consulted in the case of animal injury.
9	Road traffic accidents (on site)	The individual discovering the accident (be it bystander or able casualty) must raise the alarm giving the location of the incident. Able personnel at the scene should shut down vehicles where it is safe to do so.
		Access to the area should be restricted and access roads cleared for the emergency response team.

No	Situation	Response procedure
		Vehicles must be made safe first by trained professionals (e.g. crushed or overturned vehicles).
		Casualties will be moved to safety by trained professionals and provided with medical assistance.
		Medical centres in the vicinity with appropriate medical capabilities will be notified if multiple seriously injured casualties are expected.
		A nearby vet should be consulted in the case of animal injury.
10	Development of informal settlements	The mine will inform the local authorities (municipality and police) that people are illegally occupying the land and ensure that action is taken within 24hrs.
11	Explosions	Explosions can occur in the workshop areas when working with gas cylinders and chemicals. Explosives are also present on site for blasting during the Construction phase. Underground coal mining operations without proper ventilation can also lead to underground explosions. These could result in employees being injured and requiring medical assistance. The procedure to be followed is:
		Safe evacuation routes should be devised in the event of an uncontrolled explosion and all staff trained on relevant evacuation routes and assembly points
		Once safe to do so first responders may provide first aid to injured parties.
		All relevant emergency response units must be notified and hospitals informed of incoming patients.
		DMRE to be notified of the incident.
12	Uncovering of graves, fossils, archaeological or historical artefacts	Upon finding any fossil, archaeological or historical material all work at the affected area must cease.
		Personnel discovering the site must inform the Environmental Manager immediately and implement the Chance Find Procedure (Appendix G 5).
		Notify the SAHRA Development Applications Unit (Natasha Higgitt 021 202 8660/ nhiggitt@sahra.org.za)
		The area should be demarcated in order to prevent any further work there until an investigation has been completed.

13 CLOSURE, REHABILITATION & FINANCIAL PROVISION

13.1 Closure Objectives

The previous EMPr (GCS, 2010) identifies the following closure objectives:

- To ensure an effective surface runoff control system to deal with the separation of clean and dirty water environment;
- Rehabilitate areas as soon as possible;

- The sustainable and safe rehabilitation of all activities, to address all environmental impacts as far as practical according to the EMPr;
- The sustainable rehabilitation of all activities and the mining area, as a whole, to ensure a sustainable end use for the majority of the activity sites/areas;
- Return of land to its pre-mining state where possible (i.e. agriculture/grazing for most of the mine's lease area);
- Make all areas safe for both humans and animals;
- Ensure that all areas remaining upon closure are stable, which will prevent dust and water erosion;
- Minimise the impact on the local community;
- Minimise the impact on the surrounding economic environment and other mining activities; and
- To ensure appropriate closure certification is obtained.

13.2 Closure Actions

Closure and rehabilitation of the Forzando North Coal Mine will involve the following activities:

13.2.1 Dismantling of Infrastructure (Phase 1):

Phase 1 of the rehabilitation plan will involve the dismantling of the coal beneficiation plants; rail line and loop; administration and related buildings; carports; pipelines; conveyors; power lines; fans and vent shafts (GCS, 2010).

All scrap metal will be removed and sold where possible or disposed of at an appropriate site. Calculations in this document do not account for any value recovered from the sale of the plant, scrap metal or other material.

Building rubble and material will be transported to an appropriately licensed disposal site. Where this material is neutral and will not produce leachate harmful to the groundwater environment, it can be utilised as infill material at the base of the void (boxcut Adit) if additional material is required. The footprint should be thoroughly cleaned and all building rubble and waste material should be removed. The footprint should be loosened by ripping or discing the surface soils.

All other waste will be separated and removed from site. It will be recycled where possible or removed by reputable contractors to appropriate waste facilities for the particular waste type.

All hydrocarbons and chemicals will be removed from site by registered and reputable contractors.

Roads or sections of roads that are no longer required after completion of mining will be identified and rehabilitated: Any contaminated surface material will be removed and disposed of.

13.2.2 Active Rehabilitation (Phase 2)

Where sites have been alienated of vegetation or where soils have been compacted or covered, these will be ripped and ploughed.

The shaft entrance will be sealed and the boxcut backfilled with available overburden material stockpiled from the construction of the original boxcut adit.

All coal stockpiled will be removed and residual carbonaceous material lifted and placed onto the discard dump. These areas will be ripped to a depth of 500mm and profiled to be free draining.

The discard dump will remain post-closure however, all steep slopes will be profiled and made safe. The dump must be compacted as it is developed to prevent spontaneous combustion. Final rehabilitation of the dump will involve compaction, cladding and vegetating the dump side slopes and top. The dump will be profiled for adequate water runoff and to reduce water ingress and with appropriate erosion control measures and water diversion to reduce risk of erosion.

The PCDs downslope of the dumps will remain onsite, and must be maintained, until such time as the runoff from the area is proven to meet the water quality standards for discharge.

Culverts will only be demolished should the area prove to be free draining.

13.2.3 Topsoil and Revegetation (Phase 3)

Disturbed surface areas will be shaped and profiled to be free draining and emulating the natural surface topography, as per the final landform design.

Topsoil should be appropriately fertilised to allow vegetation to grow rapidly. If a reasonable assessment indicates that vegetation re-establishment is unacceptably slow, the soil should be analysed and ameliorated, and the area seeded with a seed mix to specification.

Once the area has been rehabilitated and seeded, access to the area should be restricted for a time, to allow vegetation establishment and prevent over-grazing and trampling.

13.2.4 Post-closure monitoring (Phase 4)

Post-closure monitoring will be undertaken for a period of at least three years.

Boundary fences will be dismantled and either disposed of at a permitted disposal site or sold as scrap. Fences erected to cordon off dangerous areas will remain in place and maintained and will only be removed once such sites are considered safe and stable.

13.3 Quantum for Financial Provision

The Financial Provisioning Regulations, 2015 (GN1147) (as amended) promulgated in terms of the NEMA states that the Holder of Mineral Right must assess their environmental liabilities in the prescribed manner. Which assessment must include the provision for annual rehabilitation and remediation costs; final decommissioning and closure activities and the remediation/mitigation of latent and residual impacts.

Section 13.3 of the BAR outlines the Financial Provision as calculated for the year ending February 2023, as well as the proposed changes associated with the Application for Environmental Authorisation.

Forzando Coal Mines (Pty) Ltd must undertake annual updates of the quantum for financial provision and associated plans in accordance with the relevant Regulations applicable at the time and submit these to the Competent Authority, being the DMRE. The relevant financial vehicle (i.e. bank guarantee, trust etc.) must be maintained and updated accordingly.

14 CONCLUSION

This report constitutes the updated and amended EMPr for Forzando North Coal Mine, and supersedes the previous EMPr and its Amendments.

The purpose of the report is to specify the proposed management, mitigation, protection or remedial measures that must be implemented through the LoM. The EMPr also contains the criteria against which environmental performance and compliance must be measured.

Forzando Coal Mines (Pty) Ltd (the Holder of the Mineral Right), their contractors and subcontractors are subject to the provision of the EMPr, the contents of which are made legally binding once approved by the Competent Authority – the DMRE.

The EMPr is a considered a working document to enable effective environmental management at Forzando North Coal Mine, and may require review and amendment through the LoM. It is noted that any Amendment must be undertaken in accordance with the NEMA and its EIA Regulations, 2014 (as amended).

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Appendix G 1: Generic Stormwater Management Plan

Appendix G 2: Preliminary Plant Rescue and Relocation Plan

Appendix G 3: High Level Alien Invasive Management Plan

Appendix G 4: Preliminary Rehabilitation Plan

Appendix G 5: Chance Find Procedure