REPORT

ENVIRONMENTAL IMPACT ASSESSMENT REPORT AND ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT COMPILED FOR THE MINING RIGHT APPLICATION FOR THE DEVELOPMENT OF LITHIUM HIGHBURY MINE SITUATED IN THE RAY NKONYENI LOCAL MUNICIPALITY OF UGU DISTRICT MUNICIPALITY, KWAZULU-NATAL PROVINCE

PREPARED FOR : SA LITHIUM (PTY) LTD

PREPARED BY : JOAN CONSULTING (PTY)LTD

DATE : APRIL 2023

DMRE REF : KZN30/5/1/2/2/10116MR.

VERSION No: : 01 (DRAFT FOR REVIEW)

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mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

ENVIRONMENTAL IMPACT ASSESSMENT REPORT
And
ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

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

NAME OF APPLICANT **:** SA Lithium (Pty) Ltd
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FILE REFERENCE NUMBER SAMRAD: KZN30/5/1/2/2/10116MR.

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process,

(a) determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;

(b) describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;

(c) identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

(d) determine the

  (i) nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and

  (ii) degree to which these impacts

    (aa) can be reversed;

    (bb) may cause irreplaceable loss of resources, and

    (cc) can be avoided, managed or mitigated;

(e) identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;

(f) identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;

(g) identify suitable measures to manage, avoid or mitigate identified impacts; and

(h) identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Project Background

SA Lithium (Pty) Ltd (previously known as Monumax (Pty)Ltd) holds a prospecting right for Lithium, Dimension Stone and Feldspar over farms The Corner No. 11328 ET , farm Umsinsini No. 13307 ET, the farm Longwood No. 10289 ET, Remainder of Glanfield of Bembridge No. 10837 ET and portion 3 of Bembridge No. 9106 ET located in the Magisterial District of Port Shepstone in the Ray Nkonyeni Local Municipality, KwaZulu-Natal Province.

The department of Mineral resources and Energy (KwaZulu Natal region) granted SA Lithium (Pty) Ltd an Environmental Authorisation and approved the Environmental Impact Assessment report and Environmental Management Programme Report on 05 December 2019 (and amended on 3 July 2020) to undertake listed activities in listing Notice 1 and 2 of the EIA regulation 2014 as amended.

The mining right application has been accepted for Dimension Stone, Lithium ore, Feldspar, Tantalum/Niobium ore and Zinc ore ("the Minerals") over the same land but detailed as follows: over portions 0,1,2 of the farm The Corner 11328, portion 1,2,5,6,7,8,9,10,11,14,17, 18,20,21 ,34, 35 of the farm Umsinsini 13307, portion 2, 3, 5,7,8 10, 11,12 of the farm Longwood No. 10289, Rem of Glanfield of Bembridge No. 10837 (Remainder of Bembridge No. 2 10837) and Portion 3 of Bembridge 9106,

Project Description

SA Lithium (Pty) Ltd proposes to commence mining of the minerals in the Highbury mining right area which comprises of 520m strike length on the MZ and LZ reef. The MZ and LZ sub-crop lies on the Northern Mountain slope of the Right boundary. The general dip of the MZ is 10-25° towards the south. The LZ dips 10- 30° to the south. Access to the open pit resources will be via a typical open pit layout using ramps inclined at 1 in 10 inclinations for each bench. The proposed project has 2 main activities for the life of mine (LoM) on a site that is 1233 hectares in extent.

- Opencast mining
- Processing Plant

The mine works program provides that the proposed Highbury Mine will operate for a period of 20 years and therefore an Environmental Authorisation is required for the duration of the

mining right. The following tasks are required to be completed prior commencement of ore production

- Preliminary works (including detailed engineering pit design);
- Site clearing and levelling
- Construction of surface infrastructure to support the operations;
- Establish waste rock dump site and management system;
- Processing Plant

Authorisations required

To establish the proposed SA Lithium Highbury Mine, the following authorisations are required, and the process of application is underway.

- A Mining Right in terms of Section 23 of the Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002) as amended;
- An Environmental Authorisation for various activities listed in terms of Section 24 (2) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The NEMA activities which are triggered by the proposed mine are listed under Regulations R983 and R984, and as such require an application for Integrated Environmental Authorisation in the form of an EIA process. All activities under Notice 1 GN 983 which require Basic Assessment will be included as part of the full EIA process; and
- A Water Use Licence for water uses that triggers section 21(a), (b), (c), (g), (i)and (j) of the National Water Act, 1998 (Act No. 36 of 1998) (NWA).
- A Waste Management License for activities listed under category B of 2013 regulations.

Public Participation

The Public Participation Process (PPP) forms part of the Environmental Authorisation process and ensures that all relevant Interested and Affected Parties (I&AP's) are consulted and involved.

The PPP in the scoping phase comprised the following:-

- Written communication with stakeholders (landowners, authorities, and the public) in the form of Background Information Documents, site notices and advertisements and a draft scoping report,
- Public meeting and landowner meeting.

The PPP will continue in the EIA phase as prescribed in the EIA regulation. The PPP will also be undertaken for the Water Use license application.

Impacts summary and their rating

The table below is a summary of the impact assessment undertaken

Table 1: impacts summary

Impact	Significance before mitigation	Significance after mitigation
Change in land use	Medium	Low
Cumulative Greenhouse gases emissions/ Climate change impact	High	Medium
Soil contamination	Medium	Low
Soil Erosion	Medium	Low
Loss of topsoil as a resource	High	Medium
Loss of land capability	High	Medium
Loss of agricultural resources and infrastructure	High	High
Noise generation and Increased noise levels	High	Low
Natural forest clearance	High	Medium
Alien invasive establishment	Medium	Low
Loss of Faunal Life	Medium	Low
Potential for accidents and injuries to workers	Medium	Low
Groundwater pollution	Medium	Low
Contamination from dirty runoff.	Medium	Low
Wetland destruction	Medium	Low

Impact	Significance before mitigation	Significance after mitigation
Loss of habitat and wetland ecological structure Impact on the hydrological functioning of the wetland	Medium	Low
Impact on Heritage Resources	Low	Low
Increased Traffic and Traffic Disruptions	Low	Low
Poor Visibility due to dust creation	Medium	Low
Lighting at night	Medium	Low
Littering on site.	Medium	Low
Job Creation	High	High
Increased Social Pathologies Linked to Influx of Workers and Job Seekers	Medium	Medium

Monitoring of Impacts

The following monitoring will be undertaken to determine the impact of the proposed mine on the environment:

- **Groundwater** monitoring (levels (quantity) and quality) will be monitored monthly. This monitoring will begin prior to construction to establish the baseline conditions and to identify the changes caused by the mine over time;
- **Surface water** monitoring (quality) will be undertaken weekly during the construction phase & 3 month post the phase and thereafter monthly.
- **Vegetation and soil** monitoring of rehabilitated areas will be undertaken following construction activities until decommissioning and rehabilitation phase.
- **Dust fall** monitoring will be undertaken on a monthly basis.
- **Noise** monitoring will be undertaken as per the Occupational Health legislation requirements.
- **Aquatic biomonitoring** will be undertaken twice a year (wet and dry season).
- **Internal Environmental Authorisation Audit** will be undertaken quarterly basis.
- **The external Environmental Authorisation Audit** will be undertaken annually by a registered Independent EAP.

Environmental Assessment Practitioner Recommendation

It is the opinion of the Environmental Assessment Practitioner (EAP) that the proposed mining activities should be authorised based on the following reasons:

- **The environmental benefit of the mineral of interest.**

In a quest to curb the global crisis of climate change (global warming), there is a need to move from fossil fuel energy production to greener and renewal sources such as Lithium batteries. Lithium is primarily used for energy generation in a form of Lithium batteries and has no carbon release. This makes Lithium (as the main mineral of interest) one of the few minerals which is used to benefit the environment. Thus, while most minerals are mined for socio-economic benefit only, Lithium is mined for the environmental benefit and still have with socio-economic benefit to the communities and the developer.

- **Sustainability**

It may prove futile or even more detrimental if the only reason for the authorisation is the benefit of the mineral of interest post mining with no consideration to the impact of the process of obtaining the mineral on the environment and the people.

The Environmental impact assessment has identified negative and positive impacts of the mining activity and provided the management measures. The impact significance ranks from high to medium before mitigation measures, and medium to low after mitigation measures are implemented. After implementing the alternatives, the extent covered by natural forest patches that will be directly impacted is less than 15hactares out of the 1233ha of the mining boundary and almost 200ha of the mine footprint .

The above was considered in light of the vast socio-economic benefits the proposed project will bring to the local community and the economy of the country. These benefits range from long term jobs (creation), community infrastructure upgrade through the implementation of the Social and Labour Plan, community benefits from Corporate Social Investments (which

the community is already enjoying under the prospecting program), benefits to local business people in a form of contracts to supply goods and provides services such as transport, mining equipment, catering and other mine support services.

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PART A

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

1. CONTACT DETAILS

Table 2 below outlines the contact details of the applicant.

1.1. Details of the Applicant

Table 2: Contact Details of the Applicant

Project applicant:	SA Lithium (Pty) Ltd
Contact person:	Ian Harebottle
Physical address:	1st Floor, Paramount Place, 105 Main Road, Green Point, Cape Town
Postal address:	1st Floor, Paramount Place, 105 Main Road, Green Point, Cape Town
Postal code:	8005
Telephone:	+27 63 586 9109
E-mail:	ian@sa-lithium.com
Cell:	+44 782 526 5120/ +27 63 586 9109

1.2. Details of the Environmental Practitioner (EAP)

Joan Consulting Pty (Ltd) was appointed by SA Lithium, as the independent Environmental Assessment Practitioner (EAP), to undertake the mining right and Environmental Authorisation application processes. Table 3 and Table 4 below outline contact details, expertise and qualifications of the Environmental Assessment Practitioner in training who prepared the report and the Principal Environmental Assessment Practitioner who reviewed and sign off the Environmental Impact Assessment (EIA) and Environmental Management Programme Report (EMPR).

Table 3:Details of the EAP

Name of the Consultant	Joan Consulting (Pty) Ltd
Report Compiled by:	Mulalo Tshilimandila mulalo@joanprojects.co.za
The report reviewed and approved by (Principal EAP)	Lufuno Mutshathama 073 912 0800 lufuno@joanprojects.co.za
Postal address:	P O Box 4147, Honeydew,2040
Physical address	09 Loerie Road, Randpark Ridge, Randburg, Johannesburg
Telephone:	011 791 5032
Fax:	086 235 5142

Table 4:Summary of the EAP's experience and Qualifications.

Name of the EAP	Experience
Mulalo Tshilimandila (EAP in training)	Mulalo Tshilimandila is an Environmental and Mineral Officer at Joan Consulting (Pty) Ltd. He holds a degree in Environmental Science from the University of Venda, and an Introduction to SAMTRAC Certificate from NOSA. He is registered as Trainee Certificated Natural Scientist, level B with the South African Council for Natural Scientific Professions ("SACNASP") with registration number 600002/15. Mr. Tshilimandila has expertise in a wide range of environmental disciplines, including Environmental Impact Assessment ("EIA"), Environmental Management Programmes ("EMPRs"), coordination and facilitation of the public participation processes ("PPP"), drafting of informed recommendations on NEMA S24G applications & the correct application of S24G guidelines, Environmental Assessment policies and procedures. Mulalo has the experience as a regulator working at Gauteng Department of Agriculture and Rural Development (GDARD) and as the consultant.
Lufuno Mutshathama	The EAP (Lufuno Mutshathama) holds a Bachelor of Environmental Science from the University of Venda. She is a certificated natural scientist

Name of the EAP	Experience
	with the South African Council of Natural Scientific Professionals (SACNASP Reg: 114437). She is also registered with the Environmental Assessment Practitioner Association of South Africa (EAPASA Reg.2019/1789). Lufuno Mutshathama has over 14 years of experience in the field of Environmental Management, having worked largely in South Africa's mining sector. She worked 3 years as an environmental officer at the Department of Mineral Resources, 2 years as a group Environmental Manager in the mining sector and just over 9 years in environmental consulting as Founder and Managing Director of Joan Consulting. Her field of expertise includes the compilation of Environmental Impact Assessments and EMPr, environmental auditing and stakeholder engagement.

2. INTRODUCTION

2.1. Background

SA Lithium (Pty) Ltd (previously known as Monumax (Pty)Ltd) holds a prospecting right and Environmental Authorisation (EA) for Lithium, Dimension Stone and Feldspar over farm The Corner No. 11328 ET , farm Umsinsini No. 13307 ET, the farm Longwood No. 10289 ET, Remainder of Glanfield of Bembridge No. 10837 ET and portion 3 of Bembridge No. 9106 ET located in the Magisterial District of Port Shepstone in the Ray Nkonyeni Local Municipality, KwaZulu Natal Province.

SA Lithium (Pty) Ltd (**SA Lithium**) has applied to convert their prospecting right into a mining right. The application for the Environmental Authorisation to mine was also applied for (simultaneously with that of the mining right) on 31 August 2022. The mining right application was accepted on 16 September 2022 for Dimension Stone, Lithium ore, Feldspar, Tantalum/Niobium ore and Zinc ore ("the Minerals") over the same land but detailed as follows: portions 0,1,2 of the farm The Corner 11328, portion 1,2,5,6,7, 8,9,10,11,14,17,18,20,21 ,34, 35 of the farm Umsinsini 13307, portion 2, 3, 5,7,8 10, 11,12 of the farm Longwood No. 10289, Rem of Glanfield of Bembridge No. 10837 (Remainder of Bembridge No. 2 10837) and Portion 3 of Bembridge 9106, The applications have been assigned DMRE reference: KZN 30/5/1/2/2/10116MR. See **figure 1** for the mining area map drawn according to regulation (2) 2 of the Mineral and Petroleum Resources Development Act , 2002 (Act 28 of 2002) (**MPRDA**).

2.2. Mining Right Area Locality

The proposed mining right area is 1233.6 hectares in extent and is located within the rural area of the Ray Nkonyeni Local Municipality, in the KwaMadlala village. The site is situated approximately 16.5km North-East of Port Shepstone town and lie South-West and adjacent to the town of Hibberdene with the centre coordinates of 30°36'13.44"S 30°29'20.91"E. The residential component of the study area changes from rural residential to small towns or holiday destinations when driving east of the study area towards the ocean. The natural landscape of the study area is characterised by a rolling topography which is created by the mountains, rivers (such as the Umzumbe and Intshambili Rivers), and the ocean to the east of the study site.

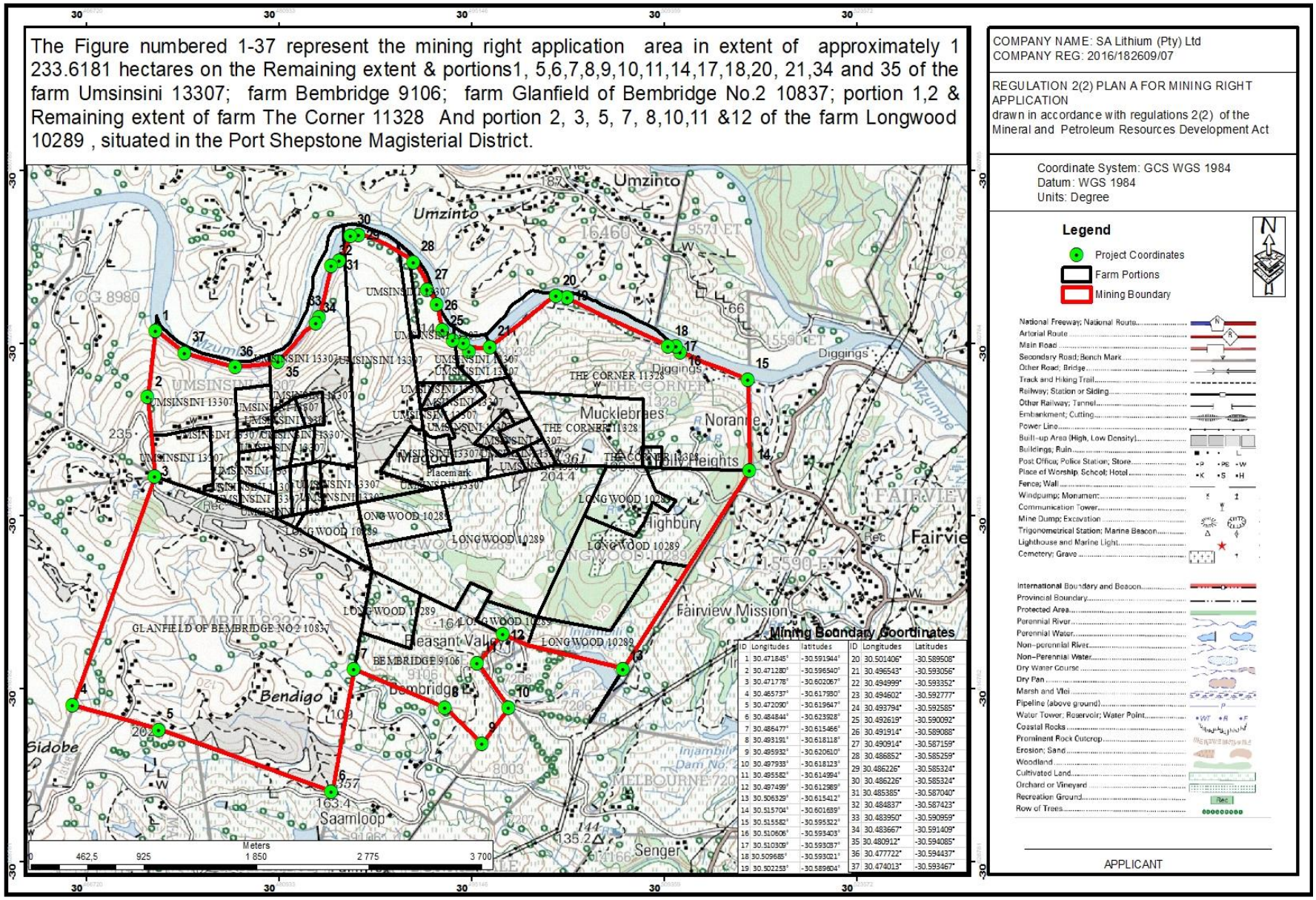


Figure 1: The proposed mining area boundary

Table 5 summarise the location details and **Table 6** is the list of farms names and their SG codes that forms part of the application area. **Figures 2 and 3** are locality maps that shows the proposed site in relation to the local town and national cities respectively.

Table 5: Location Description

Application area (Ha)	1233.6 Hectares
Magisterial district:	Port Shepstone Magisterial District.
Local Municipality	Ray Nkonyeni Local Municipality.
District Municipality	Ugu District Municipality
Distance and direction from the nearest town	Approximately 16.5km North East of the town of Port Shepstone and lie Southwest and adjacent to the town of Hibberdene

Table 6: List of farms with their SG Code.

Farm Name:	21-digit Surveyor General Code
The Corner 11328	N0ET00000001132800000
The Corner 11328	N0ET00000001132800001
The Corner 11328	N0ET00000001132800002
Longwood 10289	N0ET00000001028900002
Longwood 10289	N0ET00000001028900010
Longwood 10289	N0ET00000001028900011
Longwood 10289	N0ET00000001028900005
Longwood 10289	N0ET00000001028900012
Longwood 10289	N0ET00000001028900007
Longwood 10289	N0ET00000001028900008
Bembridge 9106	N0ET00000000910600003
Glanfield of Bembridge No 2 10837	N0ET00000001083700000
Umsinsini 13307	N0ET00000001330700035
Umsinsini 13307	N0ET00000001330700001
Umsinsini 13307	N0ET00000001330700022
Umsinsini 13307	N0ET00000001330700013
Umsinsini 13307	N0ET00000001330700011

Farm Name:	21-digit Surveyor General Code
Umsinsini 13307	N0ET00000001330700007
Umsinsini 13307	N0ET00000001330700002
Umsinsini 13307	N0ET00000001330700014
Umsinsini 13307	N0ET00000001330700018
Umsinsini 13307	N0ET00000001330700009
Umsinsini 13307	N0ET00000001330700008
Umsinsini 13307	N0ET00000001330700010
Umsinsini 13307	N0ET00000001330700021
Umsinsini 13307	N0ET00000001330700029
Umsinsini 13307	N0ET00000001330700000
Umsinsini 13307	N0ET00000001330700034
Umsinsini 13307	N0ET00000001330700017
Umsinsini 13307	N0ET00000001330700020
Umsinsini 13307	N0ET00000001330700031
Umsinsini 13307	N0ET00000001330700006
Umsinsini 13307	N0ET00000001330700005

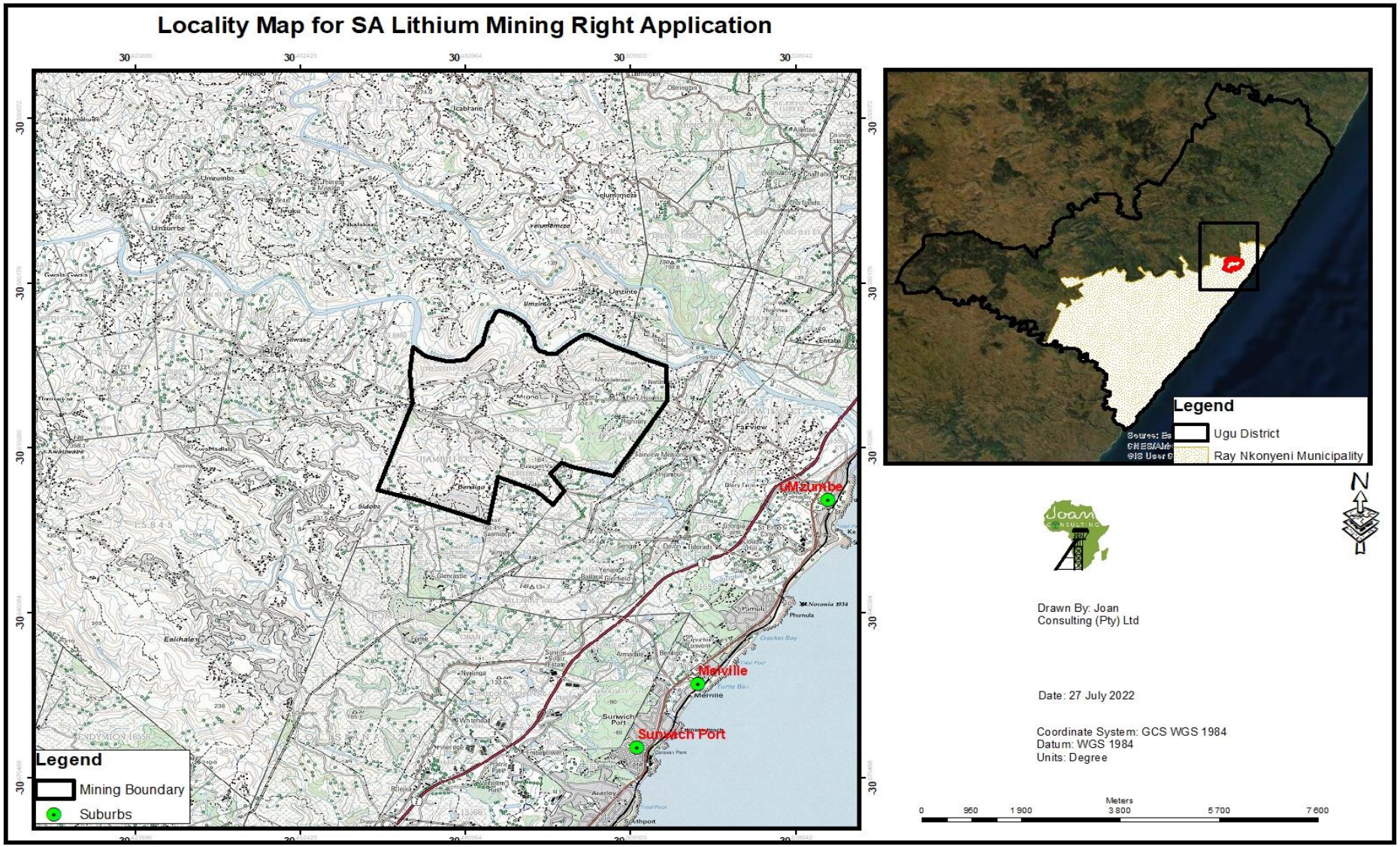


Figure 2: Locality map 1

Locality Map of the proposed mining Right Area

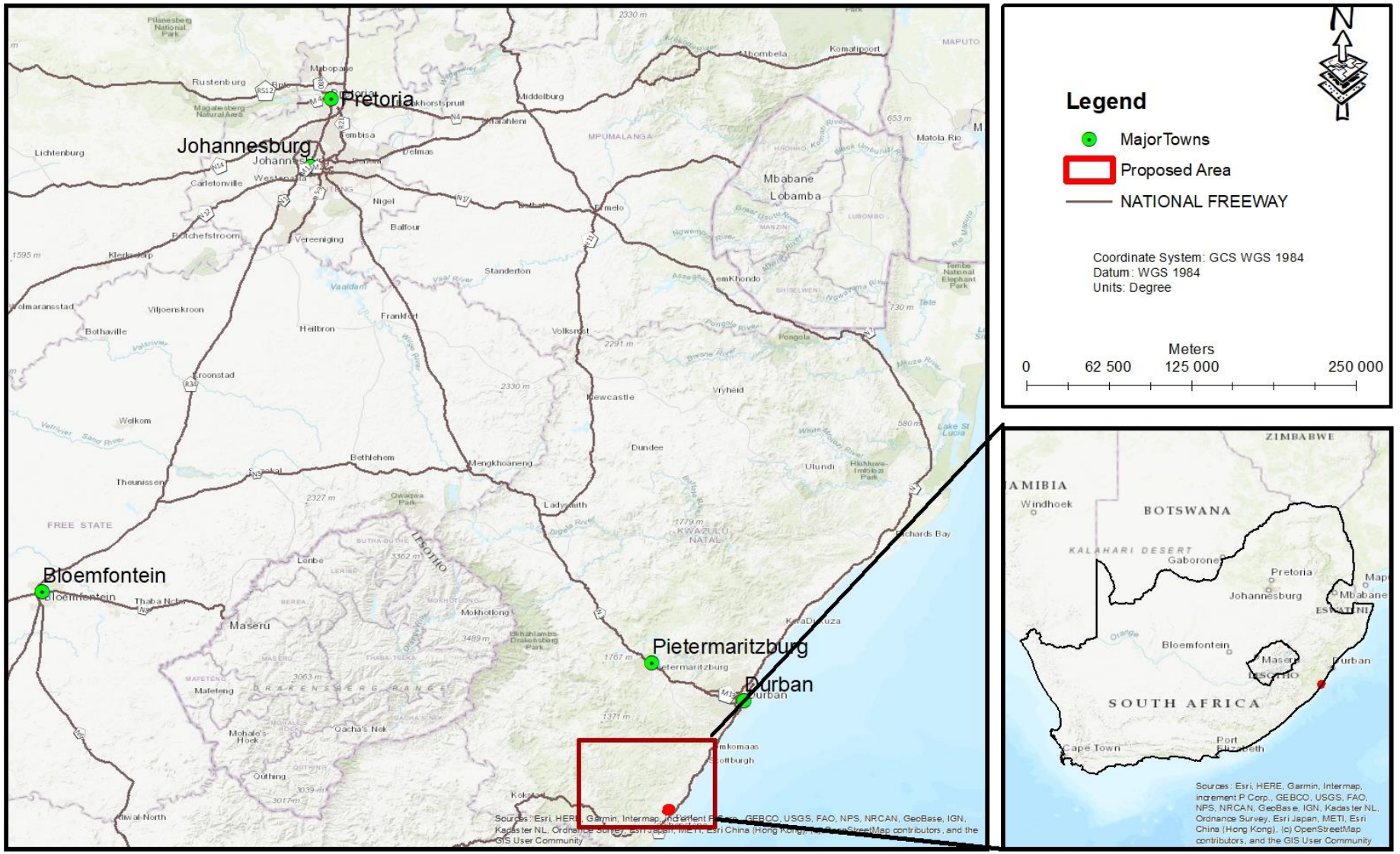


Figure 3: Locality map 2

2.3. Projected Life of Mine, Environmental Authorisation period and the mine footprint

The projected Life of Mine (LoM) according to the Mining Works Program (MWP) is 20 years. The environmental Authorisation is also required for 20 years. However, the operation footprint (within the mining right application boundary) that has been assessed for approval is just below 200ha in extent. This footprint is expected to be exhausted on year five if concurrent rehabilitation is not undertaken and can last over year 5 with concurrent rehabilitation. See **figure 4** for the mining footprint of the main activities and **Figure 5** for the~200ha impact zone.

The proposed mining area boundary has socio-economic and environmental sensitivities that requires in-depth evaluation and assessment. The rationale for the small footprint is to ensure minimum impact on the environment (with specific emphasis to the sensitive aspects) by maximising the use of a small footprint with relative low impact.
The norm is that mining activities would apply for authorisation of the worst case scenario footprint and takes not into consideration the aspect such as concurrent rehabilitation and more sustainable alternatives of sub-activities. This gives the notion that the right holder can use the area authorised in totality with no regard to investigating and implementing the best practices for conservation.

During the operational phase, a qualified Environmental Assessment Practitioner (EAP) will be appointed to assess and apply for the expansion of the mine footprint that will cater for the remaining life of mine. Undertaking the expansion assessment during the operational phase (with documented impacts and mine performance records) will give the EAP fact-based information on impacts and their intensity over and above the potential ones and will make impacts modelling easy with less gaps and limitation. Thus, the operation will be observed as a research case and will provide credible information. Furthermore; the EAP will have ample time to undertake the assessment of the mine expansion.

As indicated, the period for the Environmental Authorisation for the footprint assessed is 20 years as aligned with the Life of mine. Concurrent rehabilitation for the footprint will be undertaken but final closure will be done at the end of LOM.

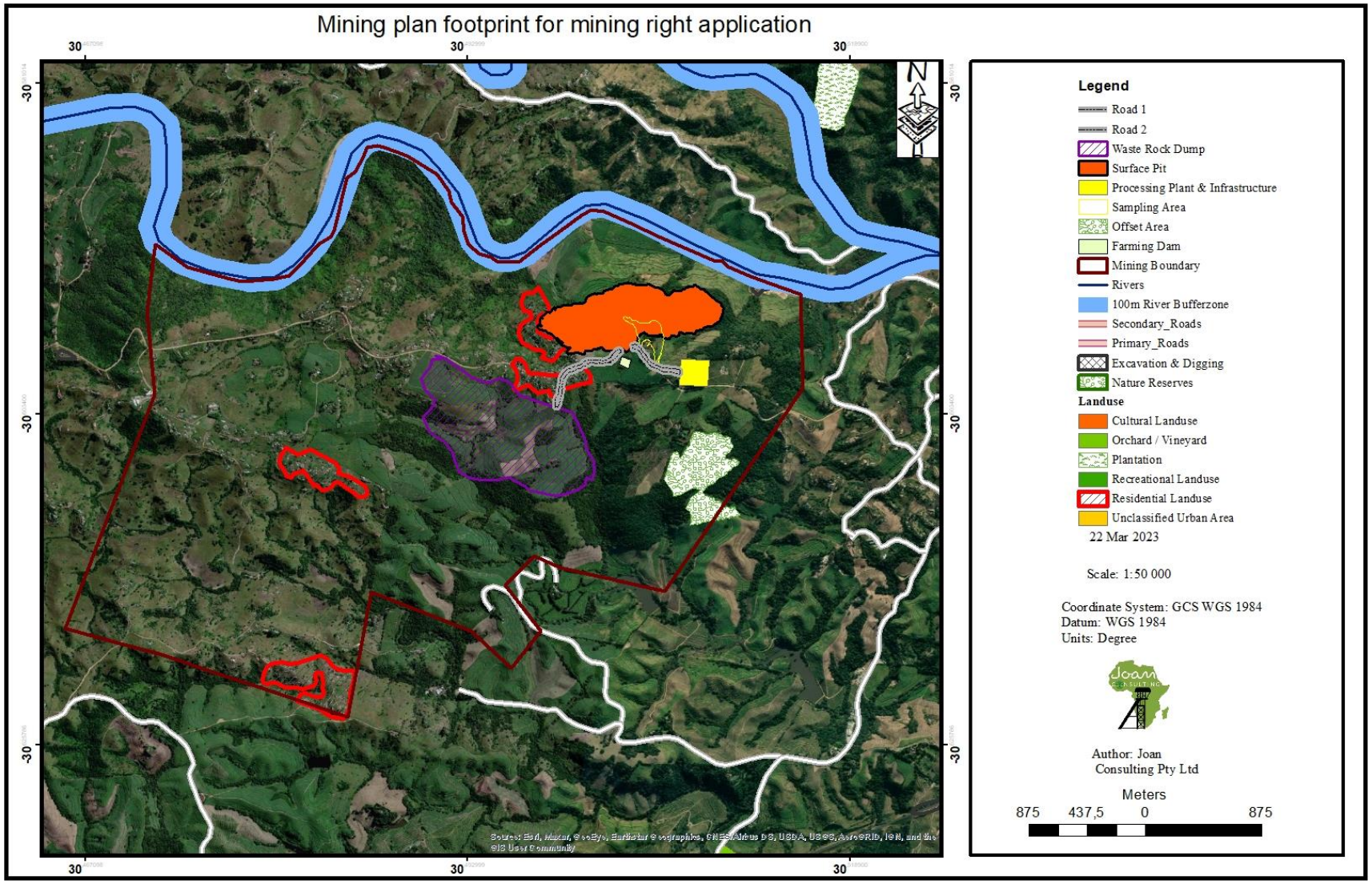
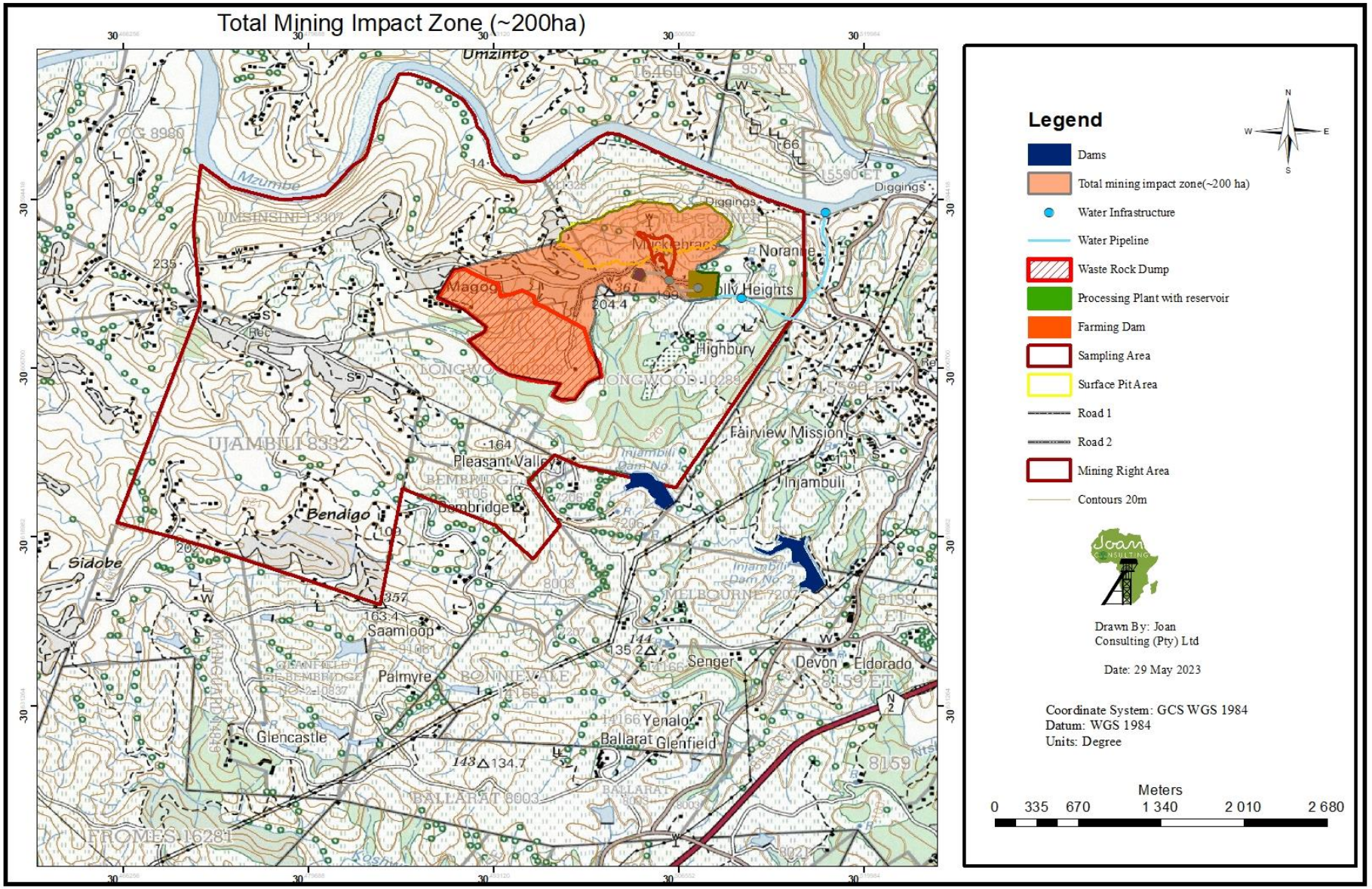


Figure 4:Defined Mine footprint


Total Mining Impact Zone (~200ha)
Legend
Dams
Total mining impact zone(~200 ha)
Water Infrastructure
Water Pipeline
Waste Rock Dump
Processing Plant with reservoir
Farming Dam
Sampling Area
Surface Pit Area
Road 1
Road 2
Mining Right Area
Contours 20m
Drawn By: Joan Consulting (Pty) Ltd
Date: 29 May 2023
Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree
Meters
0 335 670 1 340 2 010 2 680
Umzinto
Mzumbe
Diggings
Noranie
Highbury
Fairview Mission
Injambuli
Pleasant Valley
Bembridge
Bendigo
Sidobe
Saamloop
Palmyre
Glencastle
Senger
Devon
Eldorado
Yenalo
Ballarat
Glenfield

3. DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY.

The proposed project entails the mining of Lithium, Feldspar, Tin, Tantalum, Dimension stone and Zinc ("The Minerals") through an open pit mining method. This section outlines the scope of this assessment in terms of the following : :

- Listed activities to be licensed
- Licenses or authorisations required
- Specialist studies undertaken for the assessment

3.1. Listed activities and licenses

3.1.1. NEMA activities

The Environmental Impact Assessment Regulations of 2014 promulgated in terms of Section 24(5) of the National Environmental Management Act, (Act No. 107 of 1998) as amended, list activities that require Environmental Authorization from the competent authority prior to development. Table 7 below identifies activities in the proposed development that are listed in the Environmental Impact Assessment Regulations of 2014 (as amended) and Table 8 list the NEMWA regulations listed to be authorised.

Table 7: NEMA Listed Activities

Name of Activity	Extent Ha or m²	Listed activity	Specified Activity	Applicable listing notice
Activities Listed in Listing Notice 1				
The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water. **I.** with an internal diameter of 0, 36 metres or more; or **II.** with a peak throughput of 120 litres per second or more; excluding where	> 1000m	**X**	Storm water pipe/ channel	Activity 9 of GNR 327

Name of Activity	Extent Ha or m²	Listed activity	Specified Activity	Applicable listing notice
a) such infrastructure is for bulk transportatio0n of water or storm water or storm water drainage inside a road reserve or railway line reserve; or **b)** Where such development will occur within an urban area.				
The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or tailings I. with an internal diameter of 0,36 metres or more; or II. with a peak throughput of 120 litres per second or more; excluding were a) such infrastructure is for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or tailings inside a road reserve or railway line reserve; or b) Where such development will occur within an urban area.	> 1000m	**X**	Sewage pipeline	Activity 10 of GNR 327
The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	>80 m3	**X**	hydrocarbons storages	Activity 14 of GNR 327
The development of a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18	>13.5 m	**X**	Internal access roads connecting waste rock	Activity 24 of GNR 327

Name of Activity	Extent Ha or m²	Listed activity	Specified Activity	Applicable listing notice
in Government Notice 545 of 2010; or with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road (a) which is identified and included in activity 27 in Listing Notice 2 of 2014. (b) [roads] where the entire road falls within an urban area; or (c) Which is 1 kilometre or shorter.			dump, open pit area, processing plant area , the mine and the main road	
Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).		**X**	Potential impact on the CBA, natural forest and sensitive species	
Activities Listed in Listing Notice 2				
The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for **I.** the undertaking of a linear activity; or Maintenance purposes undertaken in accordance with a maintenance management plan.	>20ha	**X**	Clearance of land for mining and associated activities	Activity 15 of GNR 327
Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including; **(a)** associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource or	1216ha	**X**	Mining right application comprising of the following • Waste rock dump • Processing Plant	Activity 17 of GNR 325

Name of Activity	Extent Ha or m²	Listed activity	Specified Activity	Applicable listing notice
(b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.			• Open pit	
	56	**X**	Waste Rock and dry stack dump	

NB: The total footprint of direct and immediate indirect impact to be authorised is ~ 200ha.

3.1.2. Waste Management License (WML)

The National Environmental Management: Waste Act (Act No 59 of 2008) (NEMWA) governs all waste management activities. The proposed Project will require a Waste Management Licence (WML) for activities listed in the Government Notice 921 in Government Gazette 37083 dated 29 November 2013 which came into effect on 29 November 2013. **Table 8** below details waste activities triggered by the proposed Highbury mine development.

Table 8: Waste Management Licence Activities (NEM:WA)

Activity Number	Activity Description	Specific activity	Extent
Activities listed in Category B			
Category B, Activity 7	The disposal of any quantity of hazardous waste to land.	waste rock dump with dry stack tailings disposal	56 ha
Category B, Activity 10	The construction of a facility for a waste management activity listed in Category B of this schedule. (Not on isolation to associated waste management activity)	Return water and storm water dams	±5ha

The National Environmental Management: Waste Act, 2008 (NEMWA) and the Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits, 2015 oblige stockpiles to be fitted with the pollution control barrier systems that are required for landfill sites. The geochemical assessment/ leach test was undertaken in order to classify the waste facility in terms of GNR 635. The assessment recommendations are summarised as follows.

- The overburden material has low risk acid generating potential
- The waste rock comprise mainly of the massive gneiss (low risk acid generation potential) with a small percentage of pyrite mineralised waste rock (9 to11%). The presence of silicate minerals may offer some buffering of acid generation.
- Ore material is of low risk acid generation potential with aluminium and iron in a form of colloidal oxyhydroxides.
- A class D engineered base is recommended for the WRD.
- The waste classification is type 4 with the class D engineered base and a design that encourage runoff.

In addition to the listed activities, the mine will have infrastructure (or site/activities) required for the successful undertaking of the activity. The list of the infrastructure includes but is not limited to the following:-

- Mine pit
- Processing plant (and associated substructures & activities)
- Waste Rock and tailings dump

- Crushing plant
- Screening plant
- Workshop
- Offices
- Change houses
- Roads
- Fences
- Water management infrastructure
- Security kiosk
- Power supply
- Product stockpiles
- Above ground Fuel Storage
- Septic Tank
- Reservoir
- Weighbridge

3.1.3. Water Use License (WUL)

An integrated Water Use License Application ("IWULA") has been submitted to the Department of Water and Sanitation ("DWS") to authorise water use activities in terms of section 21 of the National Water Act, 1998. An Integrated Waste and Water Management Plan ("IWWMP") will also be submitted as a supporting technical document to the IWULA. An IWWMP serves as a management tool for the mine to manage storm water and wastewater.

Table 9 below shows the listed water uses that the project has triggered and has applied for.

Table 9: Water Licence Listed Activities applied for.

Section 21 Activity	Water use description
Section 21 (a)	• Abstraction of surface water from the Umzumbe Rive • Abstraction of groundwater from boreholes • Use of the water from the pit
Section 21 (b)	Storing process water into the converted farm dam
Section 21 (c) & (i)	Impeding and diverting the flow by

	• Location of infrastructure close or on the drainage lines and river bank • Drainage line crossing infrastructure • Conversion of the farm dam into a process water dam
Section 21 (g)	Disposing of waste in a manner which may detrimentally impact on a water resource as follows • The waste rock and dry stack dump • The dump storm water dam • The plant return water dam • The mine biofilter • 2x prospective residence and office sewage system • Plant return water dam • Use of treated sewage effluent
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; by dewatering the pit

4. DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN

(Describe Methodology or technology to be employed, including the type of commodity to be mined and for a linear activity, a description of the route of the activity)

The SA Lithium (Pty) Ltd propose to commence mining of the minerals in the Highbury mining right area through open pit mining method. The mine comprises of 520m strike length on the MZ and LZ reef. The MZ and LZ sub-crop lies to the Northern Mountain slope of the Right boundary. The general dip of the MZ is 10-27° towards the south. The LZ dips 10- 30° to the south. Access to the open pit resources will be via a typical open pit layout using ramps inclined at 1 in 10 inclinations for each bench. The deepest pot in the mining pit will be 280M. The extension of the mining pit beyond the current footprint will move towards the west in Umsinsini Fam area. The proposed project has 3 main activities for the life of mine (LoM) on a site that is 1233.6 hectares in extent.

- Opencast mining
- Processing Plant
- Waste rock & dry process waste Dump

It is anticipated that the proposed Highbury Mine will operate for a period of 20 years and therefore an Integrated Environmental Authorisation is required for the duration of the mining right. The following tasks are required to be complete prior to commencement of ore production.

- Preliminary works (including detailed engineering pit design).
- Site clearing and levelling.
- Construction of surface infrastructure to support open pit operations.
- Establish waste rock dump site and management system.
- Processing Plant.

4.1. Development of the mining open pit.

The development of the Mining Right area will commence with the mining of the Main Zone Reef from the sub outcrop on the northern faces. This mining will allow for sufficient time to complete further work on the Lower Zone reef. The Main Zone comprises a thick pegmatite dipping south. Lower Zone succession that runs parallel and below the Main Zone, and a small remnant of Top zone that follows the Main Zone Dip on the NW portion also represents substantial pegmatite formation which would become minable once processing facility has been established.

Limited infrastructure will be required for the open pit activities and where appropriate temporary facilities will be erected. The surface orebody will be mined by means of strip mining which is a common method in the industry and typically used for extraction of near surface resources.

The surface sub outcrop will be extracted from the North to the South of the site, with surface mining being determined by aspects such as safe blast radius, natural water features, mountain slope, and community housing (buffers).

During the initial phase of development and operation of the mine, approximately 250 thousand tonnes will be contract mined through a simple box-cut with the aim to later employ rollover mining methods once a large enough void has been created. This will negate the requirement for large overburden stockpiles as mine rehabilitation will be carried out concurrently with the mine development and therefore lengthen and maximise the use of the disturbed footprint planned as a ±5-year plan.

4.1.1. Overview of the mining method

The mining will take place by means of a strip-mining operation along the outcrop of the orebody with a rollover of waste back into the void created, typical of migmatite operations in general. Mining will take place by cutting 10 m benches with a final highwall height of 299m, with an overall highwall slope angle of 55-60° in order to ensure geotechnical integrity. Waste will be backfilled into the void once sufficient volume has been excavated to enable safe deposition. Waste rock dumps located on the highwall side of the operation will store excavated material until such time as pit deposition is possible.

A box-cut will be established on the northern face of the ore body, with mining progressing along strike in opposite directions away from the box-cut to establish multiple working faces and provide flexibility to the operation.

4.1.1.1. *Open Pit Mining Operation*

The mining cycle for the open pit operation would be as follows:

Bush-clearing and Topsoil Stripping

The area to be mined will first be cleared by means of a tracked dozer to enable survey control and ground levels to be established. Topsoil will be stripped by means of dozing into stockpile berms on the highwall side as well as the outcrop side of the pit. Topsoil that cannot be economically dozed will be removed to stockpile by load and haul using an excavator and

articulated dump trucks. The topsoil will be stockpiled in an area that has low erosion potential. Revegetation of the stockpile will be encouraged as a dust and erosion measure.

Establishment of Box-Cut

A box cut will be developed to establish the initial access to the orebody. The box cut will be stepped [on the highwall side] up to surface in benches. Initially overburden from the box cut will be utilised in the construction of the tailings dam walls, haul roads and construction laydown areas.

Removal of Overburden

Overburden will be excavated to stockpile using large 90t and 120t excavators matched with 40-60t dump trucks. Overburden will initially be transported to waste rock dumps located in close proximity to the final highwall, until such time that sufficient in-pit void volumes has been established, whereupon it will be re-loaded and hauled for placement in-pit.

Drilling and Blasting

Hard overburden will be drilled and blasted in benches. Blasted material will be excavated to waste rock dump area.

Ore Mining

Ore will be mined during all working hours using a 90t excavator and 40t articulated dump trucks. The hanging wall face of the exposed orebody will be swept clean by the upturned bucket of the excavator to reduce dilution to a practical minimum. The footwall wall be cleaned mechanically by the excavator.

4.2. Processing plant

Filtered tailings are becoming an increasingly common consideration for tailings management at many mines. There are more filtered dry stack tailings storage facilities than there are surface paste facilities.

This document sets out practical guidelines for the design and development of filtered dry stack tailings facilities at the Highbury Lithium Mine. These guidelines are based upon the successful conceptualization, design, and operating experience at a number of these facilities in similar deposits mined across the globe. Issues related to target moisture content, appropriate testing methods and criterion, geotechnical conditions and placement considerations are included.

The guidelines include specific reference to “lessons learned” from existing other operations.

Filtration – End Member of The Tailings Continuum

The vast majority of the world’s tailings facilities involve tailings impoundments. These impoundments are developed to store tailings slurry that typically arrives at the impoundment at solids contents of about >25% to 60% depending upon whether any thickening is carried out prior to deposition. These impoundments require construction and maintenance of structural integrity for the retention structures as well as management for what are typically immense quantities of water.

Following operation of these complex entities, closure of these impoundments can represent significant challenges in terms of both physiochemical reclamation as well as geotechnical considerations. As the future of mining includes increasing scrutiny on the industry’s stewardship of the natural environment, including use of water in most regions in the world, a commitment to alternatives beyond impoundments was sought by SA Lithium.

The amount of water that is “lost” to the voids in the stored tailings, seeps or evaporates from the tailings impoundments is something being increasingly viewed by critical regulatory and public eyes that insist on evaluating whether there are viable alternatives for any given proposed mining development or advancements.

This pressure to seek alternative tailings management approaches exists today and the future will likely only see these pressures intensified. Conventional tailings impoundments remain the best alternative for the majority of operating and proposed mines around the world. These facilities are developed using tailings slurries that are the end waste product of the milling process. However, with advances in dewatering technologies over the past few decades, that tailings slurry is actually being only part of a continuum of tailings “states” available to the modern tailings designer.

Development of large capacity vacuum and pressure filter technology has presented the opportunity for storing tailings in an unsaturated state, rather than as conventional slurry and/or in the “paste like” consistency associated with thickened tailings. For the minority set of projects that can find a non-slurried tailings alternative advantageous to optimal permitting and/or operating conditions, filtered tailings are often an excellent alternative.

Filtered Dry Stacked Tailings – Figure 5 shows the continuum of water contents available for tailings management and includes the standard industry nomenclature.

With decreasing water content comes increased expense at hauling the tailings (e.g. pumping costs increase and then, upon becoming a wet cake, the tailing are no longer pumpable and other transport methods are required). However, as the water content decreases, which means increased water recovery within the process, the tailings are far more readily able to be used in self-supporting structural situations such as stacks.

Filtered tailings are typically taken to be the dry cake material shown in **Figure 6&7**. This material has enough moisture to allow the majority of pore spaces to be water filled but not so much as to preclude optimal compaction of the material.

Filtering And Dry Stacking

The Basics Filtering of tailings can take place using pressure or vacuum force. Drums, horizontally or vertically stacked plates and horizontal belts are the most common filtration plant configurations. Pressure filtration can be carried out on a much wider spectrum of materials though vacuum belt filtration is probably the most logical for larger scale operations which is planned at Highbury. The nature of the tailing's material is important when considering filtration. Not only is the gradation of the tailings important, but the mineralogy is as well. In particular, high percentages of <74 µm clay minerals (i.e., not just clay-sized but also with clay mineralogy) tend to contraindicate effective filtration. In the case of SA Lithium, Highbury will be mining a pegmatite which largely consist of silicate and quartzites which contains no clays. The resultant tailings will be typical of beach sand with an average particle size of +500 µm which would by itself be largely free draining.

The Process

Filtered tailings emerge from the process facility within a prescribed range of moisture contents. The tailings are then transported by conveyor or truck and then placed, spread and compacted to form an unsaturated, dense and stable tailings "stack" (often termed a "dry stack") requiring no dam for retention with no associated tailings pond. The project aims to stack the tailings in layers along with the hard overburden waste being mined from the opencast pit. This layering of the tailings and hard overburden will result in the neutralization of any pyrites associated with the mafic gneiss in that the high silicate content if the tailings acting as high acid consuming agent thus neutralising any water contained in the placement area.

Experience shows the most applicable projects are those that have one or more of the following attributes:

- Reside in arid regions, where water conservation is crucial (e.g. Western Australia, Southwest United States, much of Africa, many regions of South America, arctic regions of Canada and Russia)
- Have flow sheets where economic recovery (commodity or process agent(s)) is enhanced by tailings filtration
- Reside in areas where very high seismicity contraindicates some forms of conventional tailings impoundments
- Reside in cold regions, where water handling is very difficult in winter
- Have topographic considerations that exclude conventional dam construction and/or viable storage to dam material volume ratios
- The operating and/or closure liability of a conventional tailing impoundment are in excess of the incremental increase to develop a dry stack.

In measuring Highbury against the above it was found that Highbury Lithium mine falls into at least two of the attribute categories in that the project is expected to have low water volumes emanating from the opencast mine pit and that the construction of tailings dams within the mining right area does not allow for larger scale tailing dams construction to take place.

To date, the two most common reasons to select dry stacked filtered tailings as a management option have been to recover water for process water supply and where terrain/foundation conditions contraindicate conventional impoundments. The recovery of water is particularly important in arid environments where water is an extremely valuable resource and the water supply is regulated. This recovery of water has a cost benefit to the project, which offsets the capital and operating cost of the tailings system. It should be noted that water surcharge storage needs to be factored into the design of a filtered tailings system.

By reclaiming the bulk of the process water in or near the mill, far more efficient recycling is achieved. Moreover, the amount of water “stored” in a dry stack facility will be typically >25 to 50% less than that in a conventional slurried impoundment even if 100% pond reclaim efficiency is achieved with the impoundment.

One of the main advantages of dry stack tailings over other tailings management options is the ease of progressive reclamation and closure of the facility. The facility can often be developed to start reclamation very early in the project life cycle. This can have many advantages in the control of fugitive dust, in the use of reclamation materials as they become available, and in the short and long

Progressive reclamation often includes the construction of at least temporary covers and re-vegetation of the tailings slopes and surface as part of the annual operating cycle. See figure 5 overleaf for the schematic process flow diagram.

NB: this process does not involve the addition of acids or chemicals in aiding the extraction of the mineral, rather, the dry stack process helps in neutralization of any pyrites associated with the mafic gneiss in that the high silicate content of the tailings acting as high acid consuming agent thus neutralising any water contained in the placement area.

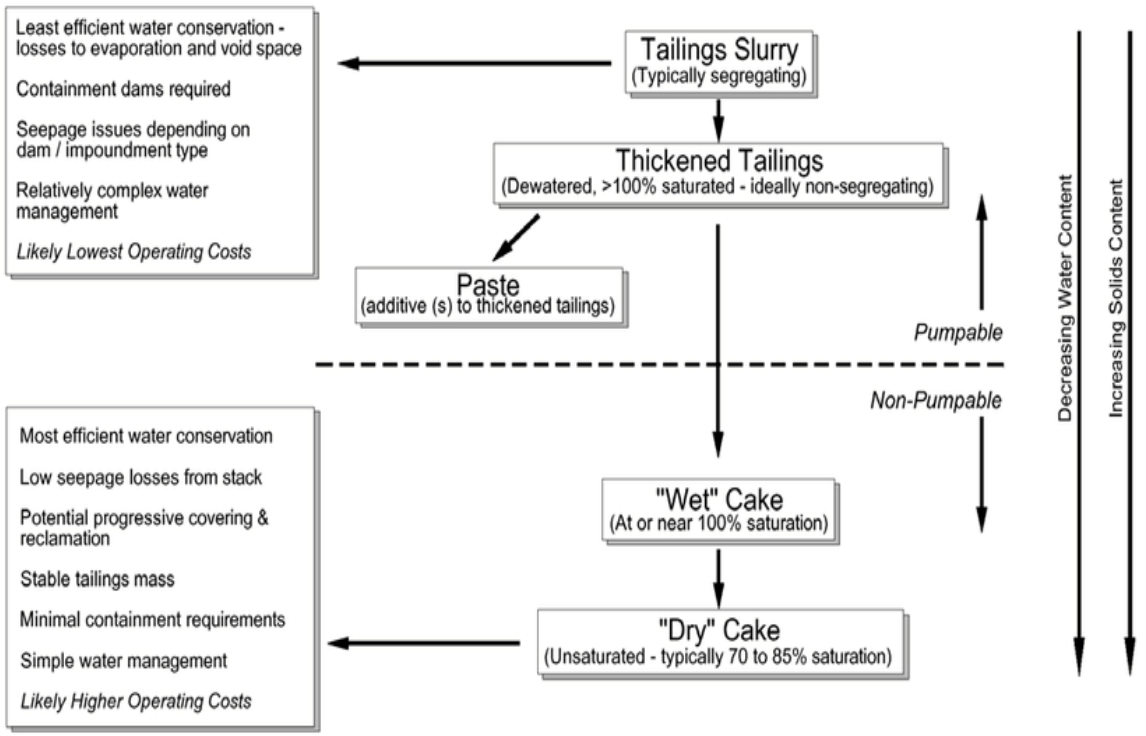


***Figure 5*: Filtered Dry Stacked Tailings and wet tailings process**

Typical flow schemes and their operating sequence is shown below:

Belt Filter without Washing

This shows a basic flowsheet existing in all applications that require straight forwards dewatering. In these applications the objective is to produce a cake with the lowest moisture and there is no importance that remaining liquid in the cake retains its original quality.

Belt Filter with Washing

This flowsheet shows the addition of a cake washing stage at some point downstream cake formation. In this application water, or any other wash liquid, is used to displace the mother liquid whenever the process requires a cake that is free of substances that contaminate the discharged cake. See figure.

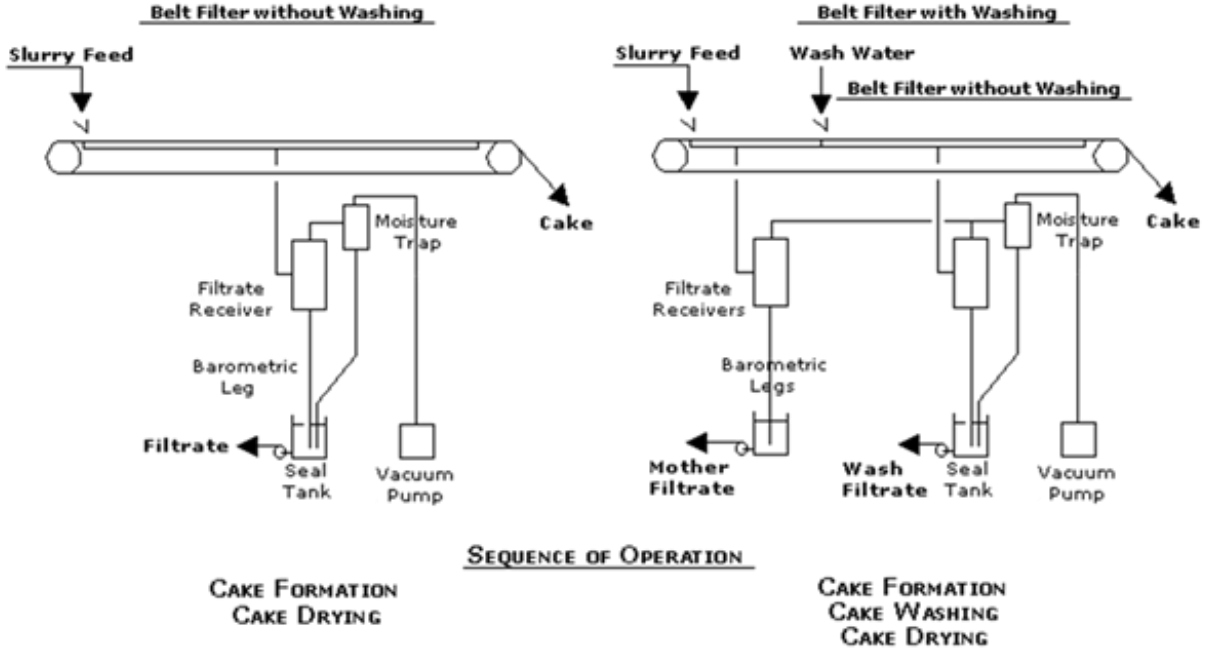


Figure 6:Belt Filter with Washing

Belt Filter with Counter-Current Washing

This flowsheet shows a counter current wash system that better utilizes the wash water than a co-current system. In this arrangement solids move in the direction of belt travel and the wash liquid in the opposite direction. For efficient washing and sharp separation between the wash filtrates the wash boxes are positioned close to the partitions that are inside the vacuum box.

The wash efficiency is defined as a percent of remaining contaminants in the final cake to the contaminants prior to wash.

Belt Filter with Counter-Current Washing and Cloudy Recycle

When a slurry is applied onto the permeable filter cloth a small amount of solids passes through the pores and finds its way to the mother filtrate. This can be avoided by inserting a partition in the vacuum box just at the point where the slurry feed meets the filter cloth. It requires incorporating a small vacuum receiver with a seal tank the removes this fraction of "cloudy" filtrate that contains the solid particles. The top of this receiver has a valve set to low vacuum so that a thin heel of cake forms on the filter cloth that serves as a filter medium over the porous cloth and produces a solid free mother filtrate.

The Drainage Belt

An endless rubber belt with traversing grooves drains the filtrate towards holes positioned along the belt. The sides of the belt have elastic rubber curbs that contain the incoming slurry and then the cake as it moves towards the discharge end. Synthetic heavy duty polyester plies are encapsulated in the rubber part below the grooves serve to withstand the longitudinal stresses to which the belt is subjected during its travel.

Drainage belts are available in 2-, 3- and 4.2-meter widths and thicknesses of 28, 32 and 39 mm. The belts may be supplied in SBR or EPDM rubbers and both are elastomers characterized by a wide range of applications.

The Filter Cloth

The filter cloth retains the cake and moves together with the belt. Nowadays, with some exceptions, they are made from synthetic materials such as polypropylene or polyester with monofilament or multifilament yarns and with sophisticated weaves and layers. The images on the right show an ultrasonically welded joint and a clipper joint of the cloth ends. With clipper joints, as may be seen on the right, it is necessary to thread multifilament strings across the entire cloth width to retain the fines from passing through to the filtrate. See figure 8.

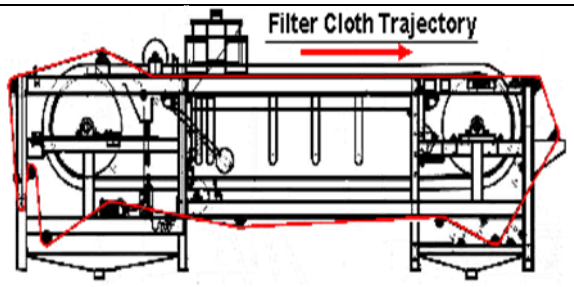


Figure 7:The Filter Cloth Trajectory

The Vacuum Box and Wear Belts

A vacuum box below the belt that is mounted along the filter and collects the filtrate through a manifold to the receivers. The box at its topside has two lips covered with low friction synthetic strip liners that seal through intermediate wear belts between the bottom side of the belt and the surface of the strips. Since the belt is the most expensive part of the filter these endless narrow belts serve as a sacrificial component that takes the wear between the surfaces, protects the rubber belt and secures against vacuum leaks. See figure 9

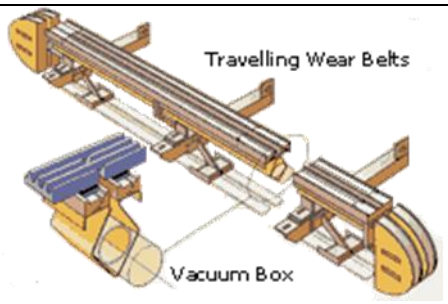


Figure 8:Vacuum Box and Wear Belts

The Vacuum Box Lowering Mechanism

A special mechanism allows parallel lowering or swinging of the vacuum box for cleaning from fines that may have settled inside. The mechanism is designed to accurately seal between the underside of the main belt and the two narrow wear belts that move together along the slide strips attached to the top shoulders of the vacuum box. See figure 10

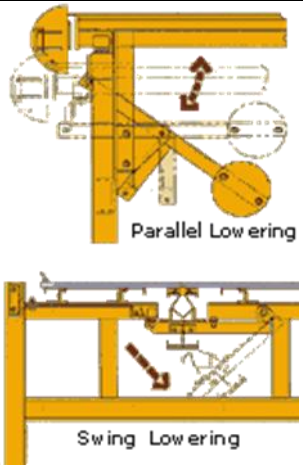


Figure 9:Vacuum Box Lowering Mechanism

The Feed, Wash Boxes and Spray Manifolds

A feed box and one or more wash boxes are mounted over the filter and designed to distribute evenly the slurry and wash water across the belt.

The Cake Discharge End

Once the belt reaches the end of the vacuum box the cake drying portion of the cycle terminates and the cloth leaves the rubber belt. The cloth continues moving, changes direction over the discharge roll and the cake drops through a chute for further ready to be transported to the dry stack area.

The Belt Supporting Deck

A deck attached to the frame and mounted underneath the belt is designed to support the heavy rubber belt and the cake load. The friction between the surfaces is reduced by injecting water for lubrication and blowing air that floats the belt or by a moving floor constructed of narrow endless belts that move together with the main rubber belt.

The Filtrate Manifold

A filtrate manifold collects and washes liquids to one or more vacuum receivers. It should be kept in mind that a short path of filtrate between the vacuum box and the receivers reduces to a minimum the losses of vacuum for both the single-phase flow of the mother filtrate and the two-phase flow of air and wash filtrates.

The Cloth Tracking Mechanism

A pneumatic or electrical tracking mechanism controls the filter cloth from slipping sideways by guiding it to the left or to the right.

There are several types of mechanisms, but the following are very common:

- Two pairs of rolls that pinch the cloth alternatively and are positioned on both sides.
- A roll is that spans across the cloth, is hinged at one end and swings forwards or backwards on the other end.

4.3. Waster rock and dry process waste dump

The open pit mining mill result in waste rock production which will need to be stockpiled for concurrent rehabilitation of the pit and for the final closure of the pit. Furthermore, the process of extracting The Minerals from the pegmatites will also produce the waste (tailings). However, the process waste is not the common slurry tailings but “dry cakes” and they are up to 50% dryer than the common slurry tailings. These dry cake process waste will also be stacked onto the waste rock stockpile. Figure 4 above shows the location of the dump footprint.

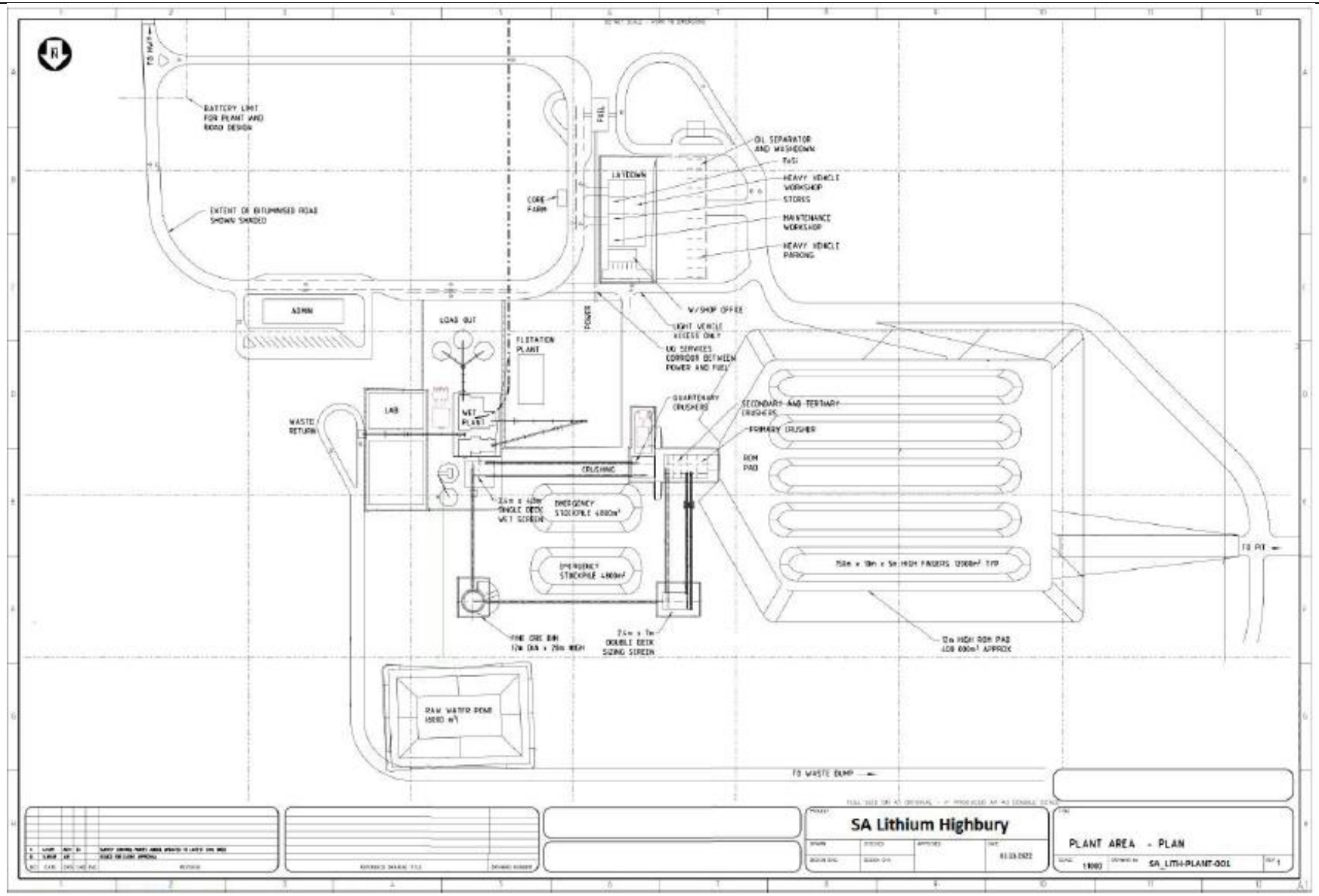


Figure 10: Plant Lay down Area with associated infrastructure

5. POLICY AND LEGISLATIVE CONTEXT

The EIA and EMPr process must take cognisance of various sets of guiding legislations to be comprehensive. The following legislations apply to the proposed Highbury mine.

5.1. The Constitution of the Republic of South Africa, 1996.

The Bill of Rights, in the Constitution of South Africa (No. 108 of 1996), states that everyone has a right to an environment that is safe for their health and well-being and requires that reasonable measures are applied to protect the environment. This protection encompasses preventing pollution; promoting conservation and environmentally sustainable development.

These principles are embraced in NEMA and given further expression. The assessment has provided mitigation measures that will ensure as far as practically possible, minimal impact of the activity on the surrounding environment and local community. The community's well-being and safety shall be put into consideration and impacts on the receiving environment will be mitigated to ensure sustainability for future generations. This report is drafted to ensure compliance with this piece of legislation.

5.2. Mineral and Petroleum Resources Development Act, 2002.

The Mineral and Petroleum Resources Development Act (Act no 28 of 2002) (MPRDA) regulates all mining-related activities and requires that authorisation, permits and rights are obtained before the removal of any minerals or the commencement of any mining activities. It makes provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. The amendments to NEMA and the MPRDA resulted in changes to align specific environmental legislation associated with mining activities and sections of NEMA and MPRDA to provide for one environmental management system. NEMA is now the primary legislation for the environmental regulation of mining and associated activities while the mining right application has been made as per the MPRDA.

5.3. Financial Provision Regulations - GN R1147.

The purpose of these regulations is to regulate the determination and furnishing of financial provision for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts through the lifespan of such operations and latent or residual environmental impacts that may become known in the future. Under Regulation 5, financial provision must be made for:

- Rehabilitation and remediation;
- Decommissioning and closure activities at the end of inter alia mining operations; and
- Remediation and management of latent or residual environmental impacts which may become known in future, including the pumping and treatment of polluted or extraneous water.

This legislation will be used to determine rehabilitation cost for the mine footprint and will be updated annually once the environmental authorisation has been granted for the duration of the mining right.

5.4. National Environmental Management Act, 1998.

The National Environmental Management Act (Act No. 107 of 1998) (NEMA) is the principal framework for environmental legislation. It sets out the principles that assist as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other laws concerned with the protection or management of the environment.

Department of Mineral Resources and Energy (DMRE) has been identified as the competent authority for the proposed project. This Environmental Impact Assessment Report will be submitted to DMRE KwaZulu-Natal region for a decision.

NEMA requires that measures are taken to prevent pollution and ecological degradation; promote conservation; and secure ecologically sustainable development and use of natural resources, while promoting justifiable economic and social development. The application takes into account the environmental and socioeconomic conditions in compliance with the NEMA principles.

Duty of Care Section 28(1) of NEMA states that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring”" (Duty of Care). If such degradation / pollution cannot be prevented, then appropriate measures must be taken to minimise or rectify such pollution. These measures may include:

- Assessing the environmental impact.
- Informing and educating employees about the environmental risks of their work and ways of minimising these risks.
- Ceasing, modifying or controlling actions which cause pollution/degradation.
- Containing pollutants or preventing movement of pollutants.

It is the responsibility of SA Lithium to ensure that the proposed mining activities and the EIA process conform to the principles of NEMA at all times. SA Lithium must take reasonable measures to prevent pollution or degradation of the environment in terms of Section 28 of NEMA.

5.5. Environmental Impact Assessment Regulations 2014.

In accordance with the provisions of sections 24(5) and 44 of the NEMA, the Minister of Environment, Forestry and Fisheries ("Environment Minister") has published the EIA Regulations, 2014 which set out the process for conducting EIAs, to apply for, and be granted, an Integrated Environmental Authorisation.

Regulation 21 to 26 and Regulation 39 - 44 of GNR 326 set out the process required to undertake the scoping and EIA process, including the PPP that must be undertaken as part of the EIA. An EIA process is required for activities which have the potential to result in significant impacts. This process accordingly provides mechanism for the comprehensive assessment of activities that are likely to have more significant environmental impacts. In terms of section 24C (2A) of NEMA, the Minister of Mineral Resources and Energy is the competent authority to issue integrated Environmental Authorisations under NEMA for activities which are directly related to mining.

5.6. National Environmental Management: Protected Areas Act, 2004.

The purpose of this Act is to provide for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes. The objectives of this Act are-

- To provide, within the framework of national legislation, including the NEMA, for the declaration and management of protected areas;
- To provide for co-operative governance in the declaration and management of protected areas;
- To affect a national system of protected areas in South Africa as part of a strategy to manage and conserve its biodiversity.
- To provide for a representative network of protected areas on state land, private land and communal land.
- To promote sustainable utilisation of protected areas for the benefit of people, in a manner that would preserve the ecological character of such areas.
- To promote participation of local communities in the management of protected areas, where appropriate; and
- To provide for the continued existence of South African National Parks.

The proposed mining development is not situated in an area zoned as protected area in terms of National Environmental Management Protected area act however, there are patches of natural forest within the mining right area that must be protected or off set to another area adjacent to the mining right area.

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

The aim of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM: AQA) is to regulate air quality to protect the environment from pollution and ecological degradation. NEMAQA's objectives are to protect the environment by providing reasonable measures for;

- The protection and enhancement of air quality in South Africa;
- The prevention of air pollution and ecological degradation;
- securing ecologically sustainable development, while promoting justifiable economic and social development; and
- Generally, to give effect to section 24(b) of the Constitution in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.

According to the NEM: AQA, air quality management control and enforcement is in the hands of local government with District and Metropolitan Municipalities as the licensing authorities. Provincial government is primarily responsible for ambient monitoring and ensuring municipalities fulfil their legal obligations, with national government primarily as policy maker and coordinator. (Air Quality Impact Assessment, December 2022).

5.8. National Environmental Management: Biodiversity Act ,2004.

National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEMBA) aims to provide for the management and conservation of South Africa's biodiversity within the framework of NEMA. Its purpose is to protect ecosystems and the species and promote the sustainable use of indigenous biodiversity.

The project has wetlands and CBA areas within the mining right application area. While these ecosystem are disturbed by agricultural activities, this piece of legislation was used as a guide when assessing the impact and providing the mitigation measures for all the project phase.

5.9. National Heritage Resources Act, 1999.

The protection and management of South Africa's heritage resources is controlled by National Heritage Resources Act (Act No. 25 of 1999) and with the South African Heritage Resources Agency (SAHRA) as the enforcing authority for this act.

In terms of the Act, historically important features such as graves, trees, archaeological artefacts/sites and fossil beds are protected. Similarly, culturally significant symbols, spaces and landscapes are also afforded protection. The National Heritage Resources Act (Act No. 25 of 1999) (NHRA) seeks to:

- Introduce an integrated and interactive system for the management of the national heritage resources.
- Promote good government at all levels, and empower civil society to nurture and conserve their heritage resources so that they may be bequeathed to future generations;
- Lay down general principles for governing heritage resources management throughout the South Africa;
- Introduce an integrated system for the identification, assessment and management of the heritage resources of South Africa;

- Establish the South African Heritage Resources Agency ("SAHRA"), together with its Council to co-ordinate and promote the management of heritage resources at the national level;
- Set norms and maintain essential national standards for the management of heritage resources in the South Africa and protect heritage resources of national significance;
- Control the export of nationally significant heritage objects and the import into South Africa of cultural property illegally exported from foreign countries;
- Enable the provinces to establish heritage authorities, which must adopt powers to protect and manage certain categories of heritage resources; and
- Provide for the protection and management of conservation-worthy places and areas by local authorities.
- Under section 34 of the NHRA structures which are older than 60 years may not be demolished without a permit issued by the relevant heritage resources authority.
- Section 35 of the NHRA deals with archaeological, paleontological and meteorite heritage resources and requires that any archaeological or paleontological objects that are found on site must be reported to the competent heritage resources authorities. The discovered archaeological or paleontological objects may not be removed, damaged or destroyed without obtaining a permit from the heritage resources authority.
- An application for a heritage permit is required under section 35 of the NHRA from the competent heritage authority for undertaking certain activities, such as constructing roads or pipelines exceeding 300m in length; a development which will change the character of a site exceeding 5,000m2; or rezoning of a site exceeding 10,000m2.
- Section 38(8) of the NHRA however states that no separate consent of the heritage authority is required where an s is undertaken under other legislation, of which NEMA is an example, provided that it meets the relevant heritage resources authority's requirements and any comments and recommendations of the relevant heritage authority are taken into account in the decision-making process.

The Mining Right Application engaged this legislation by undertaking a specialist study or assessment that will ensure compliance with this legislation. site was assessed for archaeological remains. Human remains and burials are commonly found close to archaeological sites and abandoned settlements; they may be found in abandoned and neglected burial sites or occur sporadically anywhere because of prehistoric activity, victims of conflict or crime. The heritage and archaeological report detailed the findings and the

recommendations of the heritage artefacts and sites found onsite. The Archaeological and Heritage Impact Assessment report is attached as appendix E3.

5.10. KwaZulu-Natal Heritage Act, 2008.

The KwaZulu-Natal Heritage Act (Act No. 4 of 2008) provides for the conservation and preservation of the physical and intangible heritage resources of the KwaZulu-Natal province. This legislation provides for the establishment of a statutory body to administer heritage conservation on behalf of the provincial government of KwaZulu-Natal

5.11. National Water Act , 1998.

In South Africa, water use in commercial setting and activities is controlled by the National Water Act (Act no 36 of 1998) (NWA) which provides for-

- the promotion of efficient, sustainable and beneficial use of water in the public interest;
- for the facilitation of social and economic development;
- for the protection of aquatic and associated ecosystems and their biological diversity; and
- for the reduction and prevention of pollution and degradation of water resources.

Department of Water and Sanitation (DWS) is the competent authority for this authorisation. Section 21 of the NWA defines various water uses that require a Water Use License (WUL) or any other water use authorisation. Section 21 of the NWA lists the following as the activities that require authorisation:

(a) Taking water from a water resource;
(b) Storing water;
(c) Impeding or diverting the flow of water in a watercourse;
(d) Engaging in a stream flow reduction activity contemplated in section 36 of the NWA;
(e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1) of the NWA;
(f) Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit;
(g) Disposing of waste in a manner which may detrimentally impact on a water resource;

(h) Disposing in any manner of water, which contains waste from, or which has been heated in, any industrial or power generation process;
(i) Altering the bed, banks, course or characteristics of a watercourse; and
(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.

The project will require Water Use License as it triggers section 21a, b, c, g, I and j of the NWA. An application has been initiated in the electronic application portal of the Department of Water and Sanitation called EWULAAS and application reference number is WU27214.

5.12. National Forests Act, 1998

The purposes of the Act are to:

- Promote the sustainable management and development of forests for the benefit of all;
- Create the conditions necessary to restructure forestry in State forests;
- Provide special measures for the protection of certain forests and trees;
- Promote the sustainable use of forests for environmental, economic, educational, recreational, cultural, health and spiritual purposes.
- Promote community forestry.

National Forests Act, 1998 (Act No. 84 of 1998) Section 15 (1) state that ‘’No person may—
(a) cut, disturb, damage or destroy any protected tree; or
(b) possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, or any forest product derived for a protected tree, except—
(i) under a licence granted by the Minister; or
(ii) in terms of an exemption from the provisions of this subsection published by the Minister in the Gazette on the advice of the Council.

There are patches of natural forest in the mining right area which will be directly and indirectly impacted by the mining activity. The ecological specialist studies did not record the presence of a protected tree species onsite. However, mitigation measures are in place for managing the impact.

5.13. The National Health Act, 2003.

The National Health Act, 2003 (Act No. 61 of 2003) (NHA) provides a framework for a structured uniform health system in South Africa, considering the obligations with regard to health services imposed on the national, provincial and local governments by the Constitution and other laws. Any activity that gives rise to offensive/injurious conditions or is dangerous to health (e.g., accumulation of refuse) may have a negative impact on health and thus warrants being assessed in the EHIA (DOH, 2010). The Director General (DG) should issue and promote adherence to, norms and standards on health matters, including conditions that constitute a health hazard and facilitate the provision of indoor and outdoor environmental pollution control services. The Act also provides for environmental health investigations in Section 88.

There are dispersed dwellings in the area associated with agricultural activities, with the potentially affected communities located to the east of the proposed mine. The following communities will be affected by the proposed mining development.

- Magog
- KwaMadlala
- Gwala-gwala
- Bendigo
- Gqayinyanga
- Silwane
- Sodobe
- Mandla
- Velumemeze

A health impact assessment report was undertaken to ensure that this social impact is fully addressed and that the mitigation measures are in place to keep the people safe. Health Impact Assessment Report has been appended as **Appendix 16**.

5.14. National Environmental Management: Waste Act , 2008.

NEMWA aims to regulate waste management in South Africa to protect health, well-being and the environment by providing reasonable measures for the prevent pollution and ecological degradation. It defines waste broadly as "any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded

or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered" and includes all wastes defined in Schedule 3 of NEM: WA. NEM: WA now regulates mining residue deposits or stockpiles

Section 16 of the NEM: WA must also be considered, which states as follows: A holder of waste must, within the holder's power, take all reasonable measures to-

- Avoid the generation of waste and, where such generation cannot be avoided, minimise the toxicity and amounts of waste that are generated;
- Reduce, re-use, recycle and recover waste;
- Where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;
- Manage the waste in such a manner that it does not endanger the health or the environment or cause a nuisance through odour, or visual impacts;
- Prevent any employee or any person under his or her supervision from contravening the Act;
- Prevent the waste from being used for unauthorised purposes.
- The WML List specifies waste management activities that require a WM. Activities related to treatment of effluent, wastewater or sewage are however excluded and do not require a WML.
- Where a WML is not required, the National Norms and Standards for the Storage of Waste (published in Government Gazette 37088 of 29 November 2013) (Waste Norms and Standards) must be complied with.

Waste Management License is required for the proposed mining activities and is applied as part of this Integrated Environmental Authorisation. The waste activities or infrastructure are the Waste Rock & dry stack dump and the Pollution Control Dams (PCDs)

5.15. Explosives Act, 1956 .

A licence is required for the storage and use of explosives for the proposed Project. The license is issued by the Chief Inspector of Explosives or his delegate. SA Lithium (Pty) Ltd will apply for a licence in respect of the storage and use of explosives.

5.16. South African National Biodiversity Institute

South African National Biodiversity Institute (SANBI)'s Biodiversity GIS was used during desktop research to identify sensitive environments within the area.

5.17. National Road Traffic Act, 1996.

The National Road Traffic Act (No. 93 of 1996) (NRTA) provides for all road traffic matters and is applied uniformly throughout South Africa. The act also stipulates requirements regarding fitness of drivers a vehicle as well as making provision for the transportation of dangerous goods.

Traffic Impact Assessment was undertaken to ensure that the impact of the development can be accommodated by the transportation system. The purpose of traffic assessments is to support sustainable development by protecting the overall integrity of the transportation system for the benefit of all users. Traffic Impact Assessment has been appended as appendix E16.

5.18. Occupational Health and Safety Act, 1993.

These regulations provide for the health and safety of persons at work, including aspects that are hazardous to health and safety. In terms of major hazardous installation, the regulations shall apply to employers, self-employed persons and users, who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance that may pose a risk that could affect the health and safety of employees and the public. The objectives of this Act are listed-

- to protect the health and safety of persons at mines;
- to require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;
- to give effect to the public international law obligations of the Republic that concern health and safety at mines
- to provide for employee participation in matters of health and safety through health and safety representatives and the health and safety committees at mines;
- to provide for effective monitoring of health and safety conditions at mines;
- to provide for enforcement of health and safety measures at mines;
- to provide for investigations and inquiries to improve health and safety at mines; and to promote-
  - ✓ a culture of health and safety in the mining industry;

- ✓ training in health and safety in the mining industry; and
- ✓ co-operation and consultation on health and safety between the State, employers, employees, and their representatives.

The occupational health is also incorporated in the mine health and safety which every mine subscribes to during all phases of the project.

5.19. Mine Health and Safety Act , 1996.

The objective of mine Health and Safety act are outlined below

- to protect the health and safety of persons at mines;
- to require employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at mines;
- to give effect to the public international law obligations of the Republic that concern health and safety
- at mines;
- to provide for employee participation in matters of health and safety through health and safety
- representatives and the health and safety committees at mines;
- to provide for effective monitoring of health and safety conditions at mines;
- to provide for enforcement of health and safety measures at mines;
- to provide for investigations and inquiries to improve health and safety at mines; and
- to promote—
    - a culture of health and safety in the mining industry;
    - training in health and safety in the mining industry; and
    - co-operation and cons

4.19.1.Regulatory requirements – MHSA Reg. 17.6(a)

Blast Impact Assessment study undertaken by Blast Management and Consulting report dated 08 December 2022 indicated that Mine Health and Safety act regulation 17.6(a) will not be requiring consideration. The location of the opencast Pit boundary is not closer than 100 m from private installations and no necessary legal requirements will need to be addressed. Blast Impact Assessment Report has been appended as appendix E12.

4.20. The KZN Provincial Growth and Development Strategy

The KZN Provincial Growth and Development Strategy (PGDS) is aligned with the current provincial, national and global policy frameworks, namely the six Provincial Priorities, the Twelve National Outcomes, the New Growth Path, the National Planning Commission's Diagnostic Report and National Development Plan and the Millennium Development Goals (MDGs). These policy frameworks provide the backdrop to the 2011 KZN PGDS. The primary goal and objective of the KZN PGDS include

- **Jobs creation though**
  - ✓ Unleashing Agricultural Potential
  - ✓ Enhancing Industrial Development through Trade, Investment and Exports
  - ✓ Expansion of Government-led Job Creation Programmes
  - ✓ Promotion of SMME, Entrepreneurial and Youth Development
  - ✓ Enhancement of the Knowledge Economy
  - ✓ Improvement of Early Childhood Development

- **Human Resource development through**
  - ✓ Improvement of Early Childhood Development, Primary and Secondary Education
  - ✓ Supporting Skills alignment to Economic Growth

- **Human and community development through**

  - ✓ Alleviating Poverty and Improve Social Welfare
  - ✓ Enhancing the Health of Communities and Citizens
  - ✓ Safeguarding Sustainable Livelihoods & Food Security
  - ✓ Sustaining Human Settlements
  - ✓ Enhancing Safety & Security
  - ✓ Advancement of Social Cohesion
  - ✓ Promoting the Youth, Gender and Disability Advocacy & Advancement of Women

- **Strategic infrastructure development by**

  - ✓ Developing Ports and Harbours
  - ✓ Developing Road & Rail Networks
  - ✓ Developing ICT Infrastructure

- ✓ Improving Water Resource Management and Supply
- ✓ Improving Energy Production and Supply

- **Environmental sustainability by**

  - ✓ Increasing Productive Use of Land
  - ✓ Advancing Alternative Energy Generation
  - ✓ Managing pressures on Biodiversity
  - ✓ Managing Disaster

- **Governance and policy by**

  - ✓ Strengthening Policy, Strategy Coordination and IGR
  - ✓ Building Government Capacity
  - ✓ Eradicating Fraud and Corruption
  - ✓ Promote Participative, Facilitative and Accountable Governance

- **Spatial equity by**

- ✓ Promoting Spatial Concentration
- ✓ Facilitating Integrated Land Management & Spatial Planning (KZN PPC, 2013)

This proposed project is aligned with the KwaZulu-Natal Provincial Growth and Development Strategy and will contribute to KZN economy and South Africa as a whole through the implementation of the Social and Labour plan.

4.21. ZN Spatial Development Framework

The Provincial Spatial Development Framework ("PSDF") aims to provide a clear path for spatial development and must integrate and sufficiently provide for economically and socially balanced development between rural and urban areas in the province.

The rural regions of the province are often defined as the regions where the highest poverty concentrations perpetuate. The rural regions often lack accessibility (due to terrain, distance,

and transport infrastructure) resulting in these settlements having less access to urban economic opportunities.

Furthermore, the expanse of these rural areas impacts on productive agricultural land and critical biodiversity assets and there is thus a need to focus on the protection and development of productive rural regions to develop the agricultural and biodiversity economic potential of the province as well as the ability of the rural communities to access and develop the rural economy.

4.22. Natal Nature Conservation Ordinance 15 of 1974 and KwaZulu Nature Conservation Act 29 of 1992

This legislation makes extensive provisions for protected areas (including private nature reserves) and protection of flora and fauna (including marine and freshwater fish).

The proposed mining right area is not within the protected areas as indicated by the Natal Nature Conservation Ordinance 15 of 1974 and KwaZulu Nature Conservation Act 29 of 1992.

4.23. The Mining and Biodiversity Guidelines

The Guideline provides tools to understand how the sustainable development of South Africa's mineral resources can take place in a way that minimises the impact on the country's biodiversity and ecosystem services.

This Guideline is about integrating relevant biodiversity information into decision making about mining options and how best to avoid, minimise or remedy biodiversity impacts caused by mining, and in so doing support ecologically, economically and socially sustainable development, through the use of the following principles:

- Apply the law (as a minimum)
- Use the best available biodiversity information
- Engage relevant stakeholders thoroughly
- Use best practice in environmental impact assessment (EIA) to identify, assess and evaluate impacts on biodiversity.
- Apply the mitigation hierarchy when planning any mining-related activities and develop robust environmental management programmes (EMPr)

- Ensure effective implementation of EMPr, including adaptive management.

SA Lithium takes responsibility to minimise the biodiversity impacts and rehabilitate the land to satisfying conditions after the operations and also takes responsibility to adhere to the mitigation measures provided on the EMPr.

4.24. Guidelines For Biodiversity Assessments in KZN.

The Guidelines for Biodiversity Assessments in KZN of February 2013 provided the guiding principle with regard to biodiversity conservation and sustainable development as one of no net loss of biodiversity and ecosystem processes. To achieve this principle a proactive approach to planning and biodiversity conservation must be adopted to ensure:

- The early identification and evaluation of potential biodiversity impact that may constitute 'fatal flaws', or significant biodiversity-related management issues.
- The early identification and evaluation of conceptual alternatives which could prevent, avoid or reduce significant impacts on biodiversity, or enhance or secure opportunities for biodiversity conservation.
- The appropriate design of mitigation through the mitigation hierarchy.

The guideline aims to facilitate the compilation of biodiversity reports that would expedite Ezemvelo review and assessment thereof and the relevant authorities' decision-making processes, by establishing the requirements for:

- Undertaking specialist investigations in development and land-use change processes.
- The incorporation of specialist recommendations into relevant and practical mitigation measures, and the integration of such into Environmental Management Plans/Programmes (or other environmental management instrument) where authorisation to proceed has been granted. Conservation management plans (where required) should be incorporated into the EMPR.

This guideline has been taken into consideration in preparing Biodiversity specialist study.

4.25. Guidelines For Development Activities That May Affect Wetlands

Guidelines for development activities that may affect wetlands released by the KwaZulu-Natal Department of Agriculture and Environmental Affairs (2002) includes a draft set of norms and standards for the avoidance and mitigation of impacts to wetlands in urban areas. Some of the mitigation measures were formulated in consultation of this guideline for development.

4.26. Ray Nkonyeni Integrated Development Plan

Ray Nkonyeni Municipality (RNM) Local Economic Development boasts of a number of small mining areas (7) within its jurisdiction. The mining and related processing of stone into various aggregates and crusher dust is essentially aimed at supplying the local construction industry and to boost the local economy. However, the Ugu GDS states that mining is one of the poorest performing sectors in terms of GVA growth. This is due to a number of factors.

There is therefore a need to enhance and encourage investment in this sector, through ensuring market stability. One of the ways to do this is to enhance the formalisation of the sector. In the case of the Margate quarry of NPC, it is evident that a number of brick and block making yards has established on the “doorstep” of the quarry. The construction material industry appears to be benefiting from its location in relation to the quarry. Various other quarries are located throughout the area. The Idwala Carbonates facility in Ray Nkonyeni LM is the major employer in the district but receives limited attention in terms of strategic planning. There are also potentially open up mining opportunities on the coast (to the south of Ugu).

4.27. The Noise Control Regulations GN R154

No noise control legislation within the KwaZulu-Natal province exists, with reference to the National GN R154 National Noise Control Regulations. The National legislation has set pieces for industrial and controlled areas, residential or business areas.

4.28. Ray Nkonyeni Municipality Nuisance By-laws

The Ray Nkonyeni Municipality (RNM) Nuisance By-laws (Municipal Notice 232 of 2017), Chapter 4: Prohibited Conduct. (Section 8: Noise) provides that:-

(1) No person may in a public place cause or permit to be caused any disturbance or impairment of the convenience or peace of any person by shouting, screaming or making any other loud or persistent noise or sound, including amplified noise or sound, except where such noise or sound is emanating from-

- an authorised public meeting, gathering, congregation or event; or
- an emergency or rescue announcement, which noise or sound is normally associated with such meeting, gathering, congregation, event or situation and in accordance with the conditions of authorisation of any such meeting, gathering, congregation, event or situation.

The Noise Impact Assessment is attached as Appendix 17

5. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITIES.

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location).

Although mining contribution to South Africa's GDP has declined over the past 10-20 years, it remains one of the country's critical economic cornerstones and contributes to its economic activity, job creation and foreign exchange earnings. The sector is therefore critical to the country's socio-economic status.

Lithium (Li) is a light soft silver-white metal commonly found in three types of mineral deposits: brines (saline groundwater), pegmatites (hard rock), and sediments. The contained lithia concentration is generally low and therefore only a limited number of deposits can be economically extracted.

The most common use of Lithium is to generate energy without negative impacts like climate change caused by carbon emissions from the coal-sourced energy generation. The world has begun planning and implementation of the world-wide transition from fossil fuels to renewable sources of energy. Energy transition will involve replacement of fossil-fuel power generation with renewable power installations and use of Lithium batteries to address climate change crisis. Lithium is therefore one of the key source driver in this initiative.

Most of the minerals are mined for socio-economic benefit only but Lithium is one of the few minerals that is mined for environmental benefit and still provide the same socio-economic benefit the rest of the minerals provides.

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

NB!! – This section is about the determination of the specific site layout and the location of infrastructure and activities on site, having taken into consideration the issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout.

One of the key aspects of the Scoping and Environmental Impact Assessment process is to identify and investigate development alternatives. According to the EIA 2014 Regulations (as amended), development alternatives is defined as the different means of meeting the general purpose and requirements of the activity without presenting significantly high associated impacts. It is crucial to identify and assess all rational and viable alternatives for the proposed project during then EIA Phase. Alternative sites and methods are considered and assessed below.

6.1. The type of activity to be undertaken alternatives;

6.1.1. Activity alternative 1: -Mining activity (Preferred)

SA Lithium (Pty) Ltd is a mining company and the company's interest are in mining and mineral beneficiation only. Thus, the company has no other business interests.

Advantages of this activity (mining and beneficiation) are as follows

- Job creation along with related capacity building and skills transfer;
- Strengthened local and national economy;
- Improved road infrastructure ; and
- Creation of business opportunities for local entrepreneurs.

Disadvantage of this activity is the destruction of the environment during the construction and operational phase.

This alternative is preferred because of the following reasons

- SA Lithium's business interests are on mining & beneficiation only

- The disadvantage of the activity can be managed with mitigation measures
- The socio-economic advantages outweigh the (managed) environmental impacts.

6.1.2. *Activity alternative 2 - Agriculture (sugar cane farming)*

The current land use within the mining right area is dominated by sugar cane agricultural activities. Alternative 2 is to continue with the current land use activity.

Advantages

- The project area will continue with the current land use which is dominated by sugar cane production.
- The impact on agricultural resources, land capability and land use will be well addressed by the continuation of the agricultural activities
- There will not be new environmental impacts.

The **Disadvantages** is that there will be a loss/unrealised better socio-economic benefit for the local community and the country's economy.

This alternative is not preferred because of the following reasons:

- Agriculture is not a business SA Lithium intend on undertaking.
- Cane sugar production's socio-economic benefits are very low compared to that of mining to both SA Lithium and the local community.

It is also a point to note that the sugar cane activity can be moved to another viable location while mining activity cannot as it is dependent on the orebody location, in this case the pegmatite orebody in Highbury, Hibberdene.

6.1.3. Project alternative 3 - Hospitality and Tourism

The proposed project site is adjacent to Hibberdene town. The town's hospitality and tourism business yield profits under normal circumstances (that exclude the COVID-19 pandemic). As good as this alternative is, SA Lithium is not a hospitality and tourism company but a mining company. Therefore, this alternative is not valid for the same reasons as those of alternative 2.

6.2. The mining Method alternative

6.2.1. Mining method alternative 1: Surface Mining (preferred)

The project will be operated through the Open Pit Mining Method. This method is preferred because the Lithium-bearing pegmatite orebody Is located at shallow depth, having in some areas the pegmatite outcrop on the surface area.

Advantages

- It is cheaper to undertake
- Safer to operate

The Disadvantage of this method is the environmental destruction and agricultural impact associated with it.

6.2.2. Mining method Alternative 2: Underground mining

The underground mining method is an alternative method to mining The minerals. However, this method is not preferred due to the following socio-economic reasons:

- It is a method for orebodies that are located in depth not accessible by open cast mining method. The orebody onsite is shallow and also outcrops.
- It is expensive to sink a shaft.
- It has higher health and safety risks
- While this method is less invasive on the surface, the socio-economic disadvantages deem it not viable

6.3. The property or location Alternative ;

The proposed project is situated on portions 0,1,2 of the farm The Corner 11328, portions 2, 3, 5,7,8 10, 11,12 of the farm Longwood 10289, farm Glanfield of Bembridge No 2 10837, portion 0,1,2,5,6,7, 8,9,10,11,13,14,17,18,20,21,22, 29,31,34, 35 of the farm Umsinsini 13307

in the Magisterial District of Port Shepstone in the Ray Nkonyeni Local Municipality, KwaZulu Natal Province

The property or location of the of the mining project (with specific emphasis to the mining pit) is dependent on the location of the orebody, in this case the lithium-bearing pegmatite orebody. SA lithium has undertaken exploration for The minerals over the properties indicated above only and has information on the occurrence of The minerals over this area only. Therefore there is no other alternative for the property where the activity is proposed. However there are alternative for the location of the sub-activities or the operation of the mining activity.

The open pit will be undertaken on the farm The Corner 11328 with related infrastructure situated at different portions of the mining right area.

6.3.1. Waste Rock Dump (WRD) location alternative

The waste rock is a movable structure and alternatives were assessed. It is important to note that the waste rock dump will also be a dump site for the dry stack from the processing plant. Details of the plant process and dry stack is explained in item 5.2.

WRD location alternative 1

Figure 11 below shows the initial location, size and shape of the initial WRD. This alternative is not preferred because of the following negative impacts.

- The footprint covered the wetland seep.
- The dump would impact on multiple drainage lines.
- The dump would directly destroy an extensive extent of natural forest.
- The size did not provide or take into consideration the concurrent rehabilitation of backfilling the pit with waste rock and dry stack during mining.

The positive of alternative 1 is that it provides for the worst-case scenario containment of all waste rock and the dry stack for the life of mine (which in itself is a the negative of impacting on the footprint which might be conserved).

WRD location alternative 2

Figure 12 of shows the 2nd alternative of the location, size and design of the WRD. This alternative is also not preferred because of the following reasons:

- It excluded the wetland seep but would still have a significant negative impact on the ecosystem.
- Will still impact on multiple drainage lines
- Will still impact on the sizeable area of natural forest.

The positive of alternative 2 is also that it provides for the worst-case scenario of containment of all waste rock and dry tailings stack for the life of mine (which in itself is a the negative of impacting on the footprint which might be conserved)

WRD location alternative 3

WRD location alternative 3 looks almost the same as alternative 4. However, they are different in that the alternative 3 WRD footprint would cause a direct impact on the CBA, while alternative 4 footprint excluded the direct impact to the CBA patch . Alternative 3 is not preferred based only on the direct impact of the CBA patch. See **figure 13** for WRD location alternative 3.

WRD location alternative 4 (Preferred)

This is the preferred alternative of the waste rock (and dry tailings) dump. The dump will be located on portions, 2, 10 and 11 of the farm Longwood 10289 (see **figure 14**). The reasons why it is preferred are as follows.

- It will have relative minimal manageable impact on the wetland seep, the drainage lines, CBA and the natural forest patches.
- The small size provides for a reduced direct impact on natural forest, wetland and drainage line.
- The small footprint considered the concurrent rehabilitation of backfilling the pit with the waste rock, rendering the same space usable for a long term with no increase of impact by increased footprint.
- The proximity of the dump to the pit also reduces the overall mine footprint.

While this is the preferred location and size of the dump, it will not cater for the rock and dry stack tailings that will be produced during the life of mine. This will be addressed by obtaining

approval for either expansion or a new site for the stockpile. The mine footprint will not be extended without prior assessment by and independent EAP and approval from the Competent Authority.

6.3.2. Processing plant (and other related infrastructures) location alternatives

Processing plant location alternative 1

The processing plant unlike a mine pit can be located at different points onsite and therefore can have alternatives. The main requirement of the processing plan is a relatively flat surface.

Advantages of the initial location (alternative 1) of the plant as depicted on **figure 12** are that:-

- It would be on a relatively flat surface,
- It would be on disturbed surface (sugar cane plantation)
- It would have been very close to the pit (fore ore feed)

With all these advantages, the plant location alternatives 1 was not preferred because the site would be better suited for the WRD site.

Processing plant location Alternative 2

The second and preferred location for the plant is shown in **figure 1**. This location is preferred because;

- The area is relatives flat.
- The area is close to the pit for ore feeding ease from the pit.
- The site is currently used as a farmstead.
- The site is also big enough to host the other mine activities and infrastructure such as the reservoir, the workshop, salvage yard, fuel tanks, weighbridge, offices, etc.

The downside is that there are a few natural trees that will be destroyed. The plant will be located on portion 12 of the farm Longwood 10289. The geotechnical investigation **(Appendix 14)** also recommended this area because the rock will be able to support different types of buildings/ infrastructure and plant. The area is flat and an area disturbed by the farmstead.

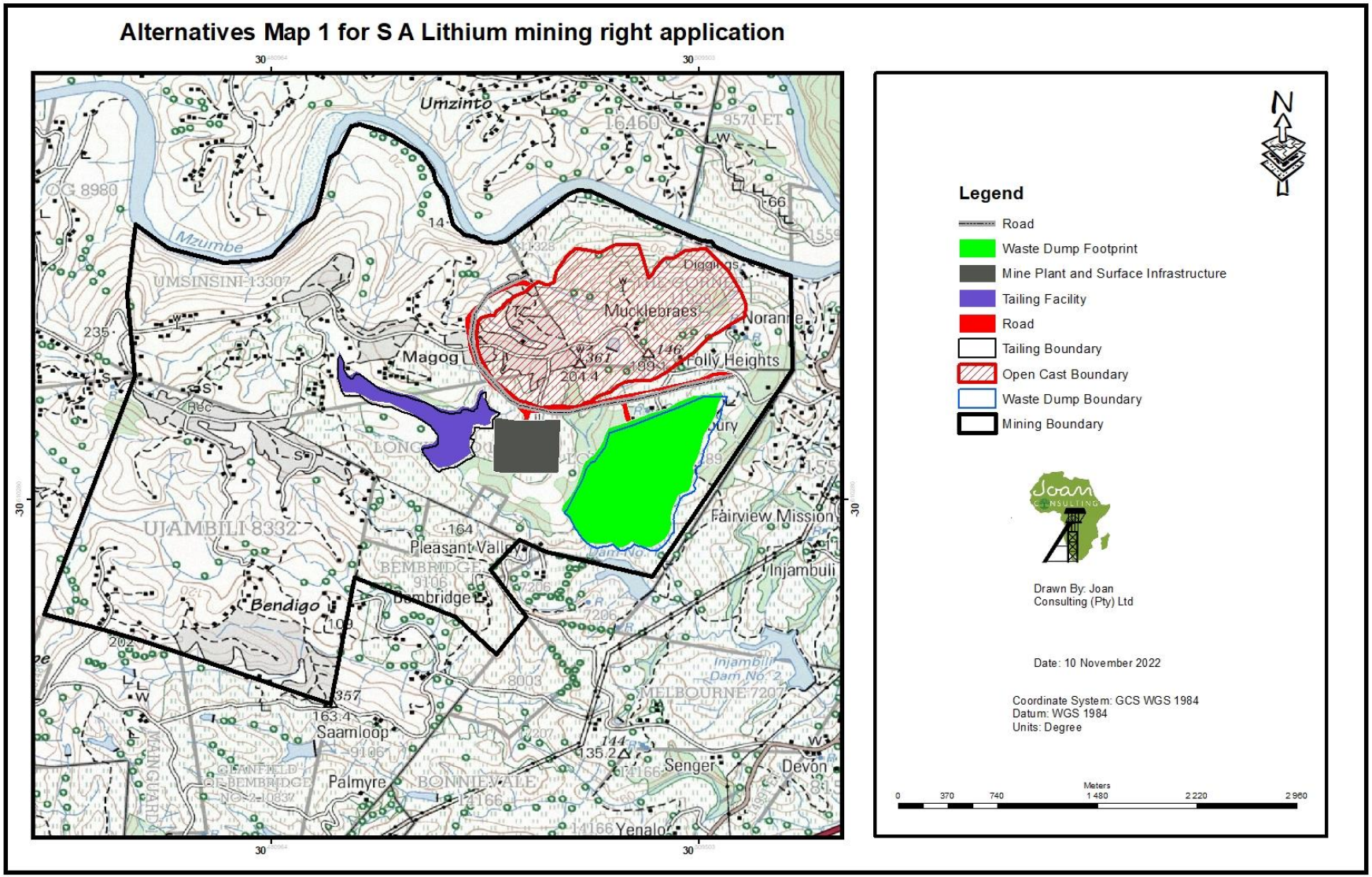


Figure 11: Alternatives 1 Map

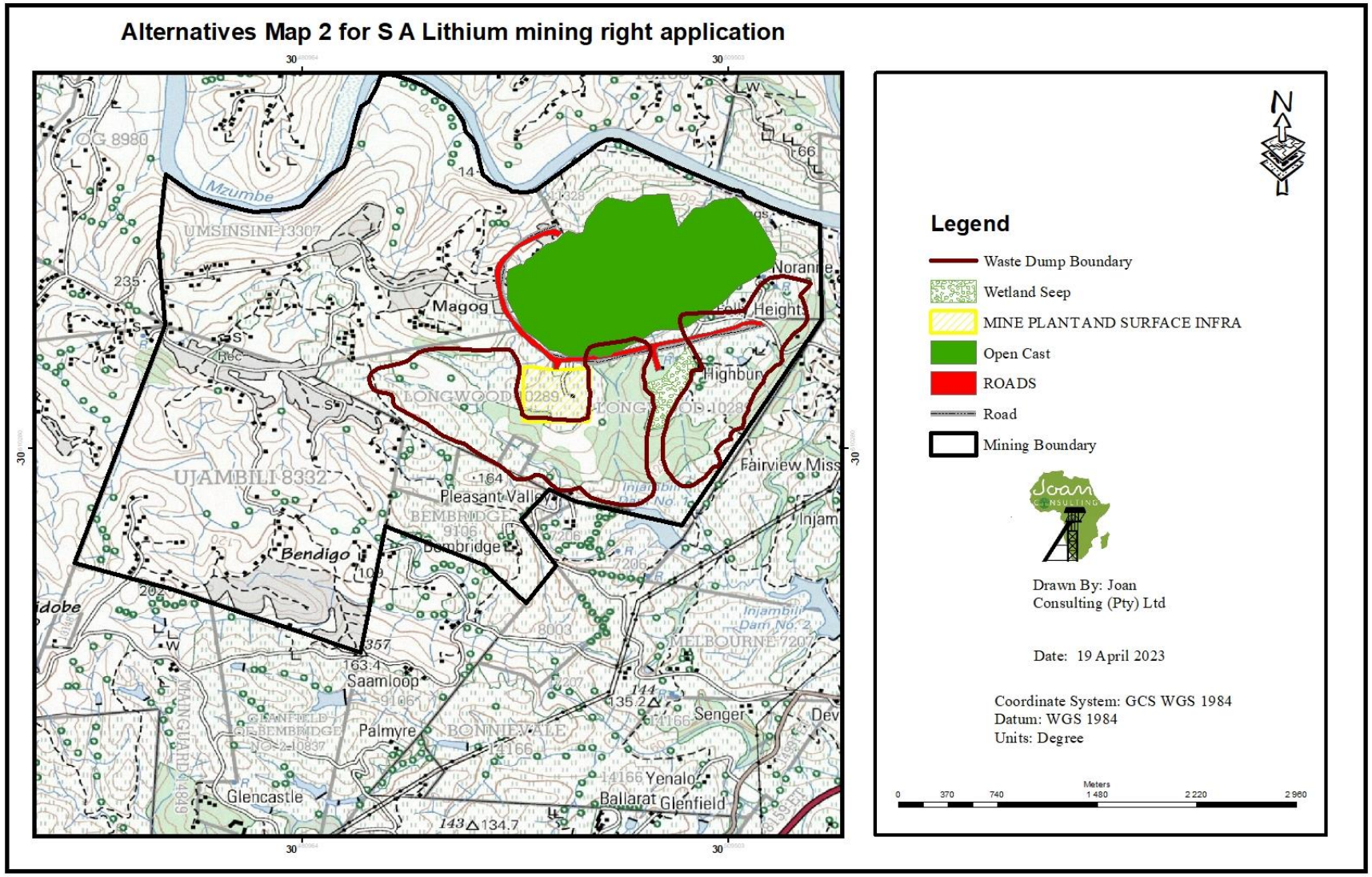


Figure 12: Alternative 2 Map

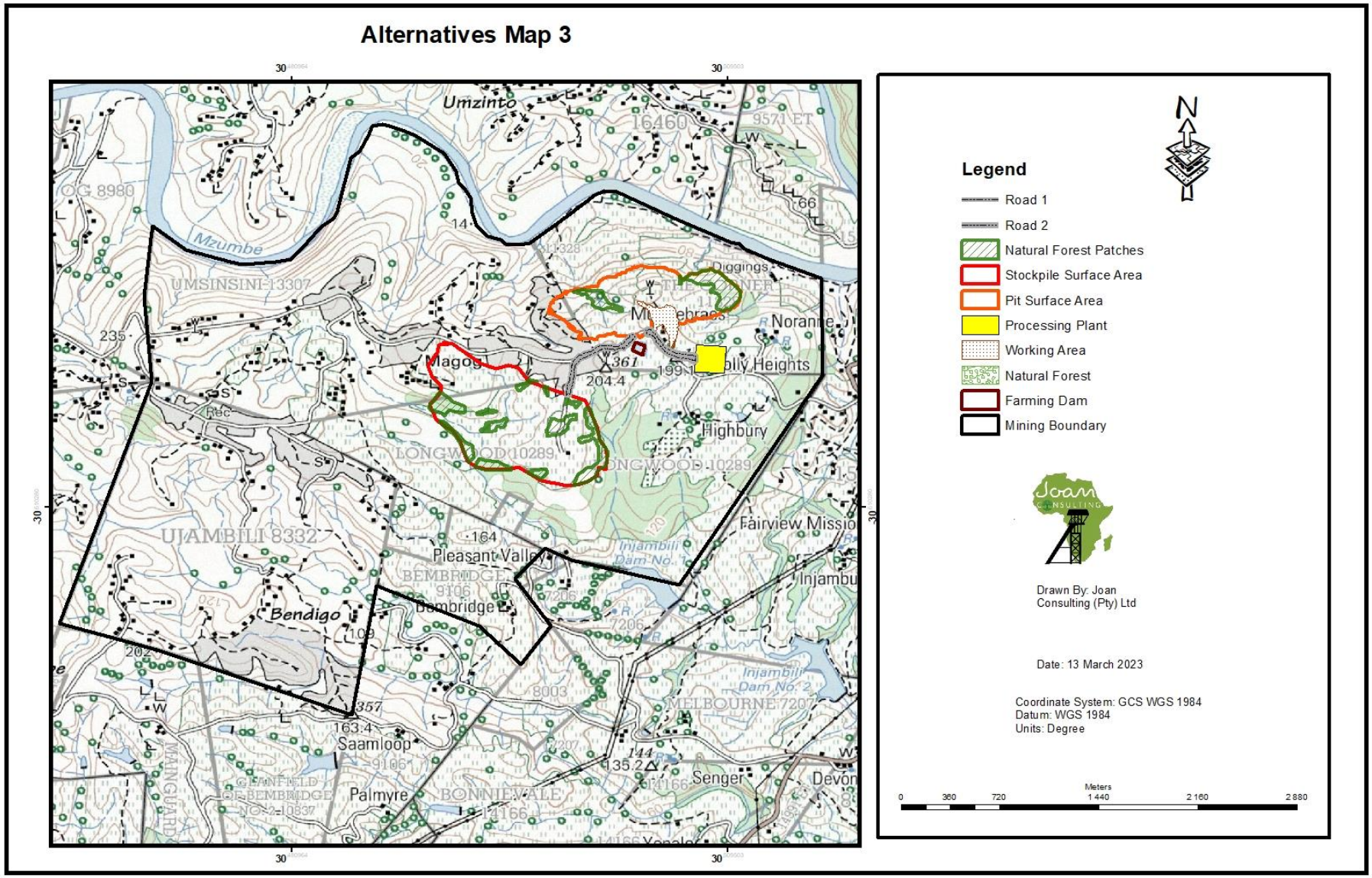


Figure 13: Alternative 3 map

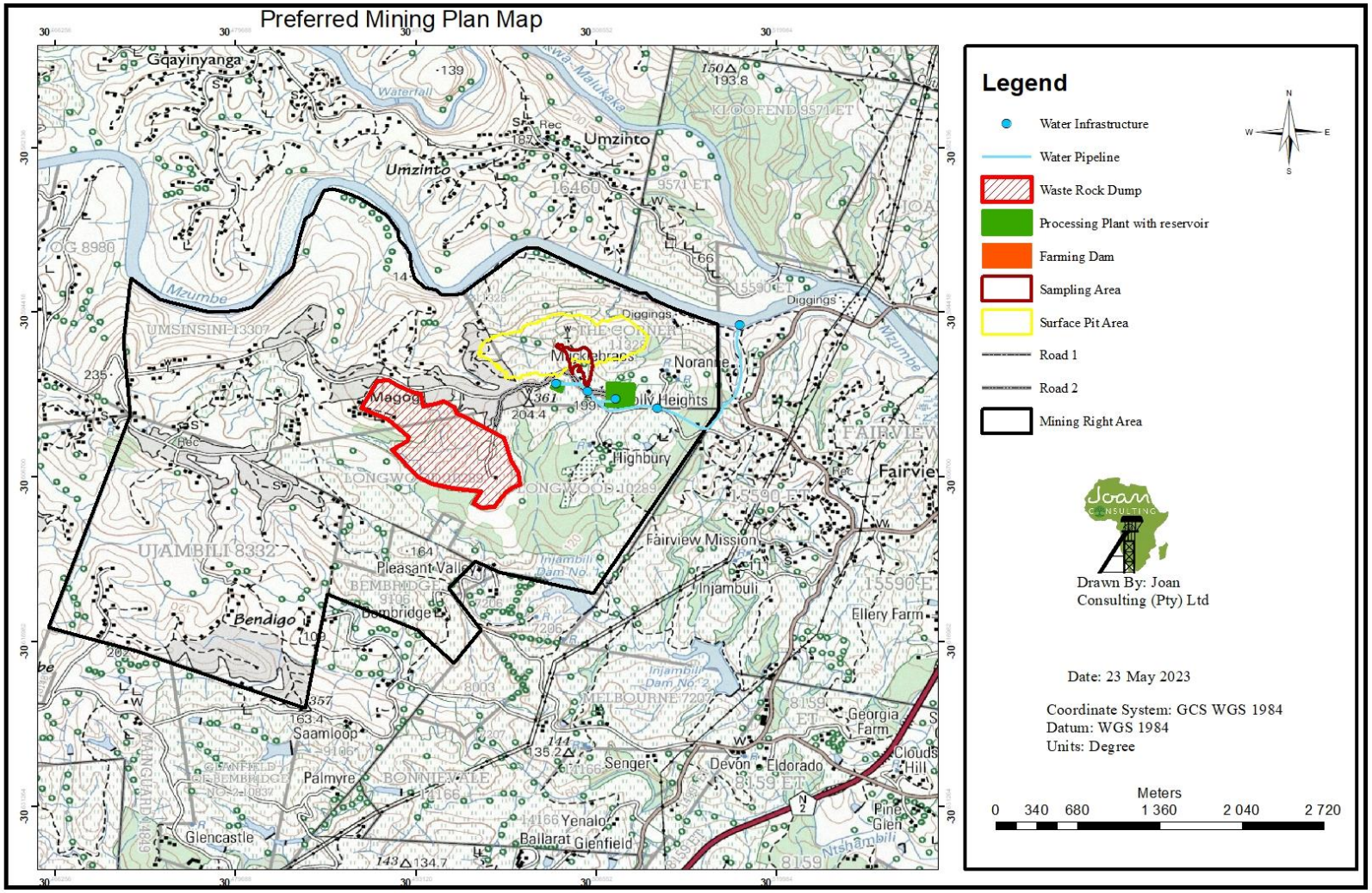


Figure 14: Alternative 4 (Preferred) map

6.3.3. Processing plant method/ technology

The method or technology or process method to be used in the extraction of the minerals from the rock has also been assessed for alternatives and they are discussed below.

Process method alternative 1: Acid leaching

In this method, the ore is mined, crushed, and roasted at about 1100°C. It is then cooled to 65°C, milled and roasted again, this time with sulfuric acid, at 250°C. During this last step, the hydrogen in the sulfuric acid is replaced with lithium ions, to produce lithium sulphate and an insoluble residue. Lime is then added for the removal of magnesium (a constituent element in spodumene), and soda ash is used to precipitate lithium carbonate from the final purified, filtered solution. Lime slurry may also be used as a pH adjuster to neutralize excess acid from the acid leaching process.

This alternative is not preferred because of the following:

- The water product from the plant is liquid tailings that will require another footprint for disposal, thereby impacting (on avoidable) natural forest and other ecosystems
- The process uses chemicals and therefore have a high pollution potential (to surface and ground water)

Process method alternative 2: Dense Media Separation (DMS) with dry stack tailings (Preferred)

The run of mine (RoM) material from the pits is delivered to the surface stockpile via truck. The stockpiled RoM material reports to crushing, screening and milling circuits prior to de-sliming for gravity concentration using Dense Media Separation (DMS).

The DMS plant design is based on the receipt of the Pegmatite product stream. The DMS plant consists of the following spiral stages:

- Rougher
- Cleaner

Dense medium separation is a form of gravity separation technology that separate particles with different specific gravities into a floats fraction (lower particle SG's) and sinks fraction (higher particle SG's).
The density at which separation occurs (also called the separation density or D50) is defined as the density at which a particle has a 50% probability of reporting to either the floats or the sinks stream. Under ideal conditions all particles with an SG higher than the separation density would report to the sinks fraction and all particles with an SG lower than the separation density would report to the floats fraction.

This process now incorporates the dry stack cake tailings instead of the normal tailings slurry.

FILTERING AND DRY STACKING

The Basics Filtering of tailings can take place using pressure or vacuum force. Drums, horizontally or vertically stacked plates and horizontal belts are the most common filtration plant configurations. Pressure filtration can be carried out on a much wider spectrum of materials though vacuum belt filtration is probably the most logical for larger scale operations which is planned at Highbury. The nature of the tailing's material is important when considering filtration. Not only is the gradation of the tailings important, but the mineralogy is as well. In particular, high percentages of <74 µm clay minerals (i.e., not just clay-sized but also with clay mineralogy) tend to contraindicate effective filtration. In the case of SA Lithium, Highbury will be mining a pegmatite which largely consist of silicate and quartzites which contains no clays. The resultant tailings will be typical of beach sand with an average particle size of +500 µm which would by itself be largely free draining.

THE PROCESS

Filtered tailings emerge from the process facility within a prescribed range of moisture contents discussed later. The tailings are then transported by conveyor or truck and then placed, spread and compacted to form an unsaturated, dense and stable tailings "stack" (often termed a "dry stack") requiring no dam for retention with no associated tailings pond. The project aim to stack

the tailings in layers along with the hard overburden waste being mined from the opencast pit. This layering of the tailings and hard overburden will result in the neutralization of any pyrites associated with the mafic gneiss in that the high silicate content if the tailings acting as high acid consuming agent thus neutralising any water contained in the placement area.

This is the processing method or technology preferred because of the following reasons:

- Uses less water compared to the conventional process.
- Use no chemicals and therefore has much lower pollution potential.
- The final product is not a slurry tailing but a drier cake stack
- The waste stack will be dumped on the waste rock thereby conserving the environment.
- This layering or stacking of the tailings cakes on hard overburden will result in the neutralization of any pyrites associated with the mafic gneiss in the high silicate content of the tailings acting as high acid consuming agent thus neutralising any water contained in the placement area.
- DMS technology is cheaper compared to traditional beneficiation using flotation due to lower capital and operating costs (reduced grinding, reagent and fines disposal costs).

6.3.3.1. Tailings Storage Facility (TSF) alternatives

Tailings are the waste products from mineral processing. They consist of ground rock, unrecoverable and uneconomic metals, chemicals, organic matter and effluent from the process used to extract the desired products from the ore. Depending on the process method, tailings can be liquid, solid or a slurry of fine particles.

The tailings storage facility alternatives are also partly discussed under the plant method alternatives.

Tailings Storage Facility Alternative 1 (slurry tailings)

The common tailings dams are used to store slurry mineral processing waste from the metallurgical plant. Tailings dams can be huge in size, as big as lakes, and reach 20 metres height. As the slurry of waste is piped into the dam, the solids settle to the bottom and the water

is recycled to be used in the separation process again. Tailings dams use earth or rock to create a barrage and the dam is then continually raised to accommodate more waste.

Disadvantages of alternative 1

- The operation of the facility has more negative impacts on the environment.
- The design, construction, operation and maintenance of the facility is expensive and requires the expertise of Engineers.
- In the unlikely event of dam failure, the impacts can be catastrophic to the communities , the watercourses and the surrounding environment .
- Tailings dams can pose a threat to local wildlife as birds and animals bathe in and drink from the contaminated waters.
- Leakage of toxic substances from tailings dams can also cause damage to the immediate environment.

Figure 12 shows the location of TSF alternative 1. However, this alternative is not preferred because of the following reasons:

- It is not necessary to have a separate TSF as the dry tailings cakes can be stacked on the overburden (waste rock).
- The footprint for the TSF \will increase the mine foot print unnecessarily (which is accompanied by destruction of ecosystem that can be conserved).

Tailings Storage Facility Alternative 2 (Preferred)

This alternative involves the storage or stacking of the dry stack tailings onto the waste rock dump and it is the preferred alternatives because of the following reasons.

- It maximises the storage space of the dump and therefore more sustainable
- This layering or stacking of the tailings cakes on hard overburden will result in the neutralization of any pyrites associated with the mafic gneiss.
- Dry stacking filtered tailings means there is no need for a dam which means dam failure risk is eliminated.
- The water generated from filtering is reused in the processing plant
- Groundwater contamination through seepage from a slurry TFS is completely eliminated

- Ground water contamination from the seepage/leaching of the Waste Rock and dry stack cakes will be minimised by the implementation of Class D engineered base as recommended by the geochemical report.

Thus, this alternative is more sustainable compared to alternative 1.

6.4. The design or layout of the activity Alternatives ;

The design and layout alternative were included in the alternatives discussed above. The are two alternatives for the design and layout.

6.4.1. Design alternative 1: ±5 year footprint

Figure 13 above shows the preferred alternative for the design. This design is preferred because it is more sustainable compared to alternative 2. The sustainability stems from the fact that alternative 1 has less direct environmental impacts on the natural forest ecosystem CBA, the wetland and the watercourses. While the footprint will not cater for the life of mine, it is believed that the five year operation will give valuable data on how to sustainably mine onsite and also the preferred site for expansion of the footprint

Design alternative 2: 20-year footprint

Figure 12 depicts the 20-year footprint design. This design is not preferred because of the extent and location of the waste rock dump, the existence of the tailing's storage facility, the location of the plant. the details on the downside of the location, size and existence of these infrastructures respectively are discussed under the alternative for each infrastructure or activity.

6.5. The operational aspects of the activity; and

The mining method selected is open pit mining. The open pit mining process consist of drilling, blasting, loading and hauling using truck and excavator combinations undertaken by a mining contractor. The open pit will be developed in two stages or pushbacks and access is provided with a single ramp system.

Proposed mining programme

The proposed mining programme will be undertaken in four phases with the estimated life of mine period of 20 years. No alternatives are considered for the operational aspects. The entire mining operations include the followings phases.

Pre-construction Phase

This is a preliminary phase associated with collection of all relevant data, laying out the schedule and the scope pertaining to the project, and will involve the following activities;

- Applicable permitting,
- Environmental authorizations,
- Baseline monitoring, and
- Additional specialist assessments

Construction Phase

This is an execution phase of all planned activities and will involve the following activities could impact on the surrounding environment;

- Stripping of topsoil and sub-soil onsite,
- construction of the clean and dirty water systems,
- Dust dispersion from infrastructure construction, and,
- Impact on water system due to excavation of the open pit

Operational Phase

During the operational phase, the followings activities could impact/affect the biophysical environment and cultural practice

- Open Cast Mining activities
- Dust dispersion from blasting, hauling, and excavating of ore
- Surface and ground water implication due to operational activities
- Sewage management, and waste management
- Ancillary activities (setting office, auto workshop)
- Baseline monitoring

Closure and Decommissioning

During decommissioning of the mine, the following objectives and proposed actions for SA Lithium decommissioning and closure phase of the mine could be considered:

- Recovery of all saleable infrastructure;
- Demolition of structures;
- Ripping of all compacted areas, which will be followed with amelioration and vegetation;
- Ensure that all remaining dumps, blend in with the surrounding
- Monitoring of key environmental variables (i.e., soils, vegetation, groundwater and surface water) to restore ecosystem integrity and function
- Weed management after closure, limited to areas disturbed by mining infrastructure or included in the mining.

6.6. The option of not implementing the activity.

The option of not implementing the activity was assessed. This option entails the following:-

- That the proposed project is not undertaken and land use remains as is (predominantly the sugar cane field).
- That there would be no additional negative and positive impacts which may be occur as a result of the proposed mining activities.
- That the area will, however, continue to yield it's impacts from the current land uses and activities practiced which are agriculture, homesteads, recreational activities and stock farming.
- That although the impact will be at a lesser extent, other benefits will not realise. This simply means that the social status of the area would remain the same and averts the necessary opportunity for the following ;
  - ∞ Job creation and related capacity building and skills transfer.
  - ∞ Conversion and diversification of the local economy.
  - ∞ Enhanced transport and rural accessibility.
  - ∞ Creation of business opportunities for local entrepreneurs.
  - ∞ National economy boost.
  - ∞ Provision of greener energy that will be generated from Lithium batteries.

Consequently, this option was therefore not a preferred option.

7. DETAILS OF THE PUBLIC PARTICIPATION PROCESS FOLLOWED

Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. (Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.

Public participation is undertaken for the following reasons;

- Provide I&APs with sufficient and correct information to assist them to raise comments and make recommendations which will be considered in the impact assessment
- Provides I&APs with the opportunity of suggesting ways of reducing or mitigating negative impacts of an activity and for enhancing positive impacts;
- Advise I&APs of the outcome of the integrated environmental authorisation (i.e. DMRE decision), and the appeals process and procedure.

Public Participation Process was undertaken for Scoping Report and will also be undertaken this Environmental Impact Assessment report and Environmental Management Programme inclusive of specialist studies undertaken for the project. This enables Environmental Assessment Practitioner to evaluate all aspects of the proposed development in an objective way.

The public participation process to be undertaken during the EIA process entails sending the draft reports to all registered and interested parties and stakeholders for review. The registered interested and affected parties will be given 30days period to provide comments on the draft report. The comments received will be addressed by sending the response to the concerned interested and affected parties and incorporate the comments in the report. The final EIA&EMPr will then be forwarded to both the Competent Authority and the registered Interested and affected parties.

Below are the PPP steps followed in scoping report phase.

7.1. Public participation process steps undertaken for Scoping Phase

The following steps/ requirements were undertaken as part of public participation in the scoping phase.

7.1.1. Pre-Application Meeting with KwaMadala Traditional Council and Mining Committee

A pre-application meeting was undertaken on 16 August with KwaMadlala mining committee. The purpose of the meeting was to:

- Introduce Joan Consulting team as Independent Environmental Practitioner appointed for the application of the proposed mining right application and to meet and consult the KwaMadlala Traditional Leadership and mining committee.
- To understand the protocols of the village on how the team should conduct themselves during the interaction with the community. This is to ensure that the team does not contravene certain protocols they are not aware of.
- Explain the application process.
- Request a Wishlist of projects the community would like the mine to do as part of the SLP. The Wishlist will assist in choosing the Local Economic Development (LED) projects (from the municipal IDP) that are aligned with the wishes of the community.

The KwaMadlala Traditional Council through its established mining committee has written a letter in support of SA Lithium (Pty)Ltd mining project. A letter of support has been appended as appendix C1. The attendance registers and minutes of the meeting are appended as appendix C9.

7.1.2. Background Information Document

The purpose of the Background Information Document (BID) is to provide summery information to assist stakeholders to receive the basic primary information about the project.: The basic information includes but is not limited to the following: -

- Share information about the proposed project;
- Present the Scoping and Environmental Impact Assessment Report (S&EIR) process that will be followed to obtain Integrated environmental authorisation (IEA) according to NEMA;
- Indicate water use activities that will be triggered by the project.
- Provide more details about the Public Participation Process (PPP) to be followed.
- Discuss the impacts and mitigation measures
- An overview of the legislative context and a description of how the EIA will be undertaken.
- Contact details of the person to whom I&APs may submit their issues and concerns associated with the projects.

- Provide the comments sheet for those with comments but don't know how to structure them.

Copies of the Zulu and English BIDs are attached as appendix C2.

7.1.3. Newspaper Advertisement

The primary aim of these advertisements is to ensure that the widest group of I&APs are informed, notified and invited to provide input and comments on the project, as well as obtaining contact information to register their interest in the project process.

The project was advertised in Ugu Eyethu and South Coast local newspapers that distribute in Ugu District Municipality. The Isizulu Newspaper advert was advertised in Ugu Eyethu local newspaper on 28 September 2022 and the English newspaper advert was advertised in the South Coast local newspaper on 29 September 2022. Both Isizulu and English Newspaper adverts have been attached as appendix C3.

7.1.4. Site Notices

The NEMA EIA Regulations require that a site notice is fixed at a place conspicuous to the public, at the boundary or on the fence of the site where the activity to which the application relates is to be undertaken and on any alternative sites. The purpose of this is to notify the public of the project and to invite the public to register as stakeholders and inform them of the Public Participation Process. Joan Consulting (Pty) Ltd personnel ensured that site notices were placed in strategic places accessible to all as part of disseminating information.

See **appendix C4** of the report for site notice photos on different locations with coordinates.

7.1.5. Registration of stakeholders

All stakeholders that responded to the project notices or adverts as well as all identified interested and affected parties, stakeholders and or state departments were registered and communicated about the project. The compiled database will be used to ensure that all stakeholders are notified of any project progress and related changes.

The stakeholder database will be updated an ongoing process for the Environmental Impact Assessment and Environmental Management programme. The stakeholder Database is attached as appendix C5.

7.1.6. Public Meeting

A Public meeting that informs and engages with the public about the project was undertaken on Sunday 02 October 2022. The meeting was held at "Mr. Reddy's Warehouse" next to Just Coffins Mortuary at 10:00. Attendance registers and minutes of the meeting are attached as appendix C9 of this report.

7.1.7. Scoping Report Review

Draft Scoping Report was forwarded and give people an opportunity to put their comments for a period of 30 calendar days from 27 September 2022 to 29 October 2022 and comments received are addressed on the comment and response sheet attached as appendix C7 of the report. Emails communication with interested and affected parties are attached as appendix C8 of this report.

7.1.8. Comments and Response Report.

The environmental impact assessment report and environmental management programme report subjected to 30 days review and comment period by interested and affected parties. Comments received during the review period will be addressed and appended as appendix C6 of the Report.

7.1.9. Consultation with KwaZulu-Natal Amafa and Research Institute

South African Heritage Resources Authority (SAHRA) and KwaZulu-Natal Amafa and Research Institute and has been notified of the mining right application with the case number 19692 and proof of consultation has been appended as appendix C10 of this report.

7.1.10. Consultation with Commission on Restitution of Land rights

An enquiry was sent to Commission on Restitution of Land rights to determine the presence of a Land Claim potential on the above-mentioned properties. It was found that none of the

properties are affected by land claims. The confirmation letters are appended as appendix C11 of this report.

7.1.11. Summary of issues raised by I&APs

Comments received from interested and affected parties from the 30 days review and comment period of Scoping Report are responded to by the Environmental Assessment Practitioner through Comments and response sheet report below. Also see comment and response sheet attached as appendix C7 of the report.

7.1.12. Public participation report

Comments, concerns and objects raised during Scoping phase public participation process were collected and compiled into a report which form part of the contents of the Scoping report. Public Participation report has been appended as appendix C of this report.

7.2. Public Participation For the Environmental Impact Assessment Phase.

Regulation 41(5) of the Environmental Impact Assessment Regulations, 2014 as amended states that "Where public participation is conducted in terms of this regulation for an application or
proposed application, sub regulation (2)(a), (b), (c) and (d) need not be complied with again during the
additional public participation process contemplated in regulations 19(1)(b) or **23(1)(b)** or the public
participation process contemplated in regulation 21(2)(d), on condition that—

(a) such process has been preceded by a public participation process which included compliance with sub regulation (2)(a), (b), (c) and (d); and
(b) written notice is given to registered interested and affected parties regarding where the—
   i. revised basic assessment report or, EMPr or closure plan, as contemplated in regulation 19(1)(b);

ii. revised environmental impact assessment report or EMPr as contemplated in regulation 23(1)(b); or

iii. environmental impact assessment report and EMPr as contemplated in regulation 21(2)(d); may be obtained, the manner in which and the person to whom representations on these reports or plans may be made and the date on which such representations are due.

Sub regulation (2)(a), (b), (c) and (d) talks to the fixing of site notices, written notices, newspaper adverts in local newspaper and newspaper adverts in national newspaper. The scoping phase PPP addressed sub regulation) (a), (b)and (c) (sub regulation d is not applicable to this project) . These requirements addressed in the scoping phase will not be undertaken in the EIA phase. The following activities will be undertaken to fulfil public participation process for the EIA phase.

7.2.1. Updating existing I&Aps database

The law requires that a database of all registered I&Aps be opened and maintained. This is to ensure that everyone interested or affected is known and informed of any development in the life of the project. Joan Consulting (Pty) Ltd has compiled stakeholder database for interested and affected parties. The stakeholder database will be updated for new interested and affected parties that may register. Interested and affected parties Stakeholder database will be attached as appendix C5 of this report.

7.2.2. Draft Environmental Impact Assessment Report

The draft Environmental Impact Assessment report and Environmental Management Programme will be sent to all registered interested and affected parties via emails and those individuals who do not have means to electronic access will use copies of the reports that will be at the site office and the tribal office. The state departments that need hard copies will also receive hard copies delivered by courier service provider. The interested and affected parties will have 30 days period to review and comment on the report. Comments received from interested and affected parties will be addressed and response which will be included in the report.

7.2.3. Submission of the report

A final Environmental Impact Assessment report and Environmental Management Programme inclusive of all comments received will be submitted to the KwaZulu-Natal region of the department of Mineral Resources and Energy for consideration.

7.3. Summary of issues raised by I&Aps

Summary of issues raised by interested and affected parties during scoping phase of the project are presented on the Table 10. These comments include tasks to be done in the EIA phase. The summery of issues raised during the EIA will be incorporated into the final report that will be shared with all registered I&AP and submitted to the Competent Authority.

Table 10:Summary of issues raised by I&Aps (scoping phase)

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
Mr Apo Mulinga of Umzumbe Mining	03 October 2022	We would like to register as interested and affected party in respect of SA Lithium mining right application. Can you please forward us a copy of the DMRE acceptance letter as well as the scoping report?	Good day Mr. Mulinga, Attached please find the acceptance letter and the copy of the scoping report. You have been registered as an interested and affected party.
Strategic Consultant 2018	06 October 2022	The proposed mining project will take in the following properties • The Corner Farm 11328 • Longwood farm 10289 • Umsinsini farm 13307 As we all have knowledge of consultation is defined as a two-way process between the applicant and the affected part wherein the applicant is seeking, listening to and considering the input of the affected part which allows openness. We are unable to give consent for the above-mentioned properties due to land dispute which is	Good day, Your email is received I order. Attached please find the draft scoping report for your review and comments.

		defined as a social fact in which at least two parties are involved and whose origin consist of differences in interest regarding land, which aggravated by different social position of the parties involved which also exclude others in pertaining in the community affairs. The Madlala chieftaincy was allotted with location 5 after brought back from Mapondoland by Natal colonial government, this land was always a trust registered in the name of Natal Native Trust, SADT and Currently registered in the name of Ingonyama trust. As they are listed as a beneficiary community. It is unclear whether the Inkosi, is the owner of the land claimed by him or he was elected to be representative of the claimants in terms of section 10 subsection 3, KZN restitution has been consulted through it was telephonic communication. In their response, they said if there is valid evidence that Inkosi has never owned the properties, we can oppose these claims of Longwood and the corner	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		farm and it can only be done through an attorney or advocate. So many times, we made request that this land claim must be resolved before granting any mining right as mining rights are issued by Mineral Resources without regard for the contested nature of land ownership and without adequately consulting all interested and affected communities and land claimants. There is an going court case between Mzizi family and Maquthu family, the applicant Mrs Maquthu is the daughter of Mr Ndaba who claim to be the owner of sub 34 of portion 34 as per application for more information department of Justice port Shepstone can be consulted in regard with this case 3295/2021 held at Port Shepstone magistrate court or contact the following attorney who represents all parties involved.	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
Mfanafuthi Ngcongo	12 October 2022	The above matter refers • We act for and on behalf clients known as Mzizi family • Our clients advise us that your company has been instructed by SA Lithium (Pty)Ltd to conduct its affairs accordingly. • Our client advise that they have resided in the farm over decades. • Moreover, our clients are involved in a dispute with Lucy Kathleen Maqutu under case No:3295/2021, Port Shepstone, Magistrate Court over abovenamed portion which form	Dear Mr. Ngconngo, Your correspondence on behalf of the Mzizi family is acknowledged and appreciated. The deeds registry does shows that portion 34 of farm Msinsini is owned Dr Maqutu. However, we also appreciate that you don't want to burden us with the court papers. Therefore, we hereby consult the Mzizi family as interested and affected parties to the project. I have attached the draft scoping report for your client review and comments (if any). Also we will appreciate the contact person and details of the family so that we can copy them in the next communications. The due date for comments is 29 October 2022.

		forms part of portions your client intents to do mining on. • The Maqutu's claim the apportion 3 belongs to them. So the matter is pending before court • For your information it has been placed in dispute that portion 34 belongs to the Maquthu's. • Our instructions are to advise that our clients are affected an interested parties herein and therefore they must be consulted in terms of section 10(1) of the mineral and Petroleum Resources Development Act 28 of 2002(''the Act'') • Any mining that has to take place will obviously affect them as they have been the inhabitants of the area for the longest of time. • We do not intend to burden you with the court papers in this matter, however, the court processes are in the public domain. You are however at liberty to peruse the court file or approach our offices in order to inspect and / or peruse the file. • In the meantime, it will be unlawful, unreasonable and procedurally unfair for your	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		company to proceed with the project without our clients involvement or consent. • We trust that you understand our clients position and that you would desist from any conduct that is unreasonable and irrational under the circumstances. We urgently look forward to your responses	
Department of Forestry Fisheries and Environment: KwaZulu-Natal forestry management: forestry regulations and support	12 October 2022	The Department of Forestry, Fisheries and Environment (DFFE) appreciates the opportunity given review and comments on the scoping report for the above-mentioned mining and associated activities. DFFE through the sub-directorate Forestry Regulations and Support is the authority mandated to implement the National Forests Act No. 84 of 1998 by regulating the use of natural forests1 and protected trees species in terms of the said Act. The purpose of this Act is to promote	The comments are acknowledged and appreciated. Terrestrial Ecological Assessment Report Impact assessment has been undertaken for the project. The specialist has been attached as appendix E10

		sustainable forest management and the development of forests for the benefit of all. With reference to the scoping report the vegetation within the site falls within the KZN Coastal Belt Grassland as well as KZN Coastal Belt Thornvelds. The natural vegetation within the proposed site has been impacted and transformed to a certain extent by anthropogenic activities such as farming and settlements. However, there are remnants of vegetated forests found in some parts of the farm. The activities listed on listing notice 2 include “the clearance of an area of 20 hectares or more of indigenous vegetation”. Furthermore, the potential impacts identified include the impacts on fauna and flora-degradation of natural vegetation and habitat for animals’ life. Therefore. The Department supports the Biodiversity Assessment as well as the scope of work associated with it. In addition, this study should include, the type and condition of the vegetation species found within the site as well and the extent of which they will be impacted. Furthermore, the Department requests that the	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		study addresses the potential impacts that the proposed activities may have on natural forest(s) as well as protected tree species occurring within or in close proximity to the proposed project site. The Department further requests that the Environmental Management Programme should include potential areas for conservation, rehabilitation and indigenous forest establishment within the proposed site. Sufficient and informed comments will be issued upon receipt and review of the EIA report inclusive of the associated specialist studies. This letter does not exempt you from considering other environmental legislations. Should any further	
KZN Wildlife (Ezemvelo)	27 October 2022.	Thank you for forwarding Ezemvelo KZN Wildlife (Ezemvelo) a hard copy of the Draft Scoping Report (DSR) for review and comment. The report has	This is noted. The comment is appreciated.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		been reviewed by Ezemvelo staff. Before engaging with the specifics of this application, we feel it is necessary to address Ezemvelo's standing.	
		Ezemvelo is the statutory support structure of the Nature Conservation Service Board (the 'Board'), a juristic body. Ezemvelo is the authority mandated to conserve biodiversity in the Province under the KZN Nature Conservation Management Act, Act 9 of 1997; we have a statutory and fiduciary duty to provide professional comments on land-use changes outside of protected areas, where such changes may have a detrimental effect on ecological processes and biodiversity. It is also the Organization's statutory and fiduciary duty to advise other organs of state (and therein licensing authorities) of any prescribed process where there may be a threat to the environment and particularly biodiversity. Ezemvelo is also the Organ of State in the Province charged with the duty to fulfil the legal provisions and requirements provided for in the	This is noted. The comment is appreciated.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		National Environmental Management: Biodiversity Act (Act 10 of 2004), the Natal Nature Conservation Ordinance 15 of 1974 and the KwaZulu Nature Conservation Act, 1992, which includes inter alia decisions regarding the issuing or not of permits for the destruction or removal (translocation) of protected and specially protected indigenous animals and plants, and threatened and/or protected species. Further to the above, Ezemvelo has a specific vested duty in this area, having purchased for conservation a property (Rem of Portion 25 of the Farm Fairview No. 15590, Mzumbe)1 located approximately 2.9 km downstream of the proposed mining area.	
KZN Wildlife (Ezemvelo)	27 October 2022.	Ezemvelo KZN Wildlife wishes to emphasize from the outset that Ezemvelo is not 'Anti-Mining'. The proposed mining site does, however, present a challenge for mining due to areas of high biodiversity importance within and close to the proposed mine lease area. Direct and indirect	A 100m buffer will be provided from the proposed development due to the sensitivity and the importance of the Umzumbe River to ensure its protection. Furthermore, A wetland specialist appointed to undertake wetland specialist report

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		impacts on biodiversity within the proposed mine lease area is of concern, as well as potential water quality impacts and concomitant impacts on the Umzumbe River, Umzumbe Estuary, and marine environment.	will recommend a required buffer for protection of Umzumbe River and marine environment.
		Section 5 of the DSR - Policy and Legislative Context, is incomplete. This mining application must also be assessed against the legal instruments and guiding policy frameworks listed below2. Good reason needs to be given for not applying and evaluating this application against these applicable and important government policies and guidelines.	The EAP does take into account all policy and legislative context for the sustainable development of the mining activities including all policy listed during the compilation of the Environmental Impact Assessment report. This is to ensure that all policy and framework are assessed for the proposed development.
KZN Wildlife (Ezemvelo)	27 October 2022.	**The Convention on Biological Diversity (CBD)** South Africa signed and ratified the Convention on Biological Diversity (CBD) in 19953. The CBD also adopted a strategic plan which contains the Aichi Biodiversity Targets for various strategic goals. Any proposed development that threatens to undermine or compromise South Africa's ability to meet its CBD	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		obligations is not environmentally sustainable and therefore cannot be permitted in law.	
		Implementation Manual for Freshwater Ecosystem Priority Areas (WRC Report No. 1801/1/11, 2011) Potential impacts on strategic spatial priorities for conserving South Africa's freshwater ecosystems is of concern. Lithium extraction can expose local ecosystems to poisoning and other health problems. FEPA's need to stay in good condition to achieve biodiversity goals (for river ecosystems and aquatic species) and to protect water resources for human use. The recommended one-kilometre NFEPA buffer to FEPA rivers must be applied. This must be viewed as a "minimum" buffer. Specialist input will advise whether a larger buffer is required.	A buffer from the river was considered to protect NFEPA within the vicinity of the project.
KZN Wildlife (Ezemvelo)	27 October 2022.	**The Mining and Biodiversity Guideline** The Mining and Biodiversity Guideline4, which provides explicit direction regarding where biodiversity may limit the potential for mining, is a	The mining and biodiversity guideline will be referenced and consulted during the compilation of EIAR and EMPr to limit impacts that may be posed to the environment during mining operations.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		key guideline document that needs to form part of the assessment and evaluation of this mining application.	
KZN Wildlife (Ezemvelo)	27 October 2022.	**KwaZulu-Natal Nature Conservation Ordinance Act 15 of 1974** A permit from Ezemvelo will be required before protected plant species can be removed/translocated or destroyed**.**	A permit will be applied to Ezemvelo to remove protected trees on site should they be found and need for their removal or translocation.
		KwaZulu-Natal Biodiversity Offset guidelines Ezemvelo's experience from similar activities elsewhere suggests that mining may trigger the need for a biodiversity offset, as specified in the KwaZulu-Natal Biodiversity Offset guidelines and draft national policy5. Ezemvelo will only be able to establish if biodiversity offsetting is required once further details are provided such as the proposed mine plan.	A layout for the project will be available during the EIAR comment and review period. Ezemvelo.
		Please find listed below biodiversity features within and in close proximity to the site that will	

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		need to be carefully evaluated and assessed in this Environmental Impact Assessment (EIA).	
		1. A Critical Biodiversity Area (CBA) The north-western section of the proposed mine lease area is identified as "irreplaceable" in the Provincial Systematic Conservation Assessment (SCA). Irreplaceability values are determined by the summed value of the biodiversity features in the planning unit and take into account whether conservation targets for the biodiversity features can be achieved elsewhere in the province or not. Irreplaceable planning units or areas are required to attain provincial conservation goals and targets. The primary features driving the irreplaceability of the site in question is: (i) the modelled presence of invertebrates of conservation importance, (ii) South Coast Grassland (Critically Endangered) and (iii) South Coast Bushland (KZN Coastal Belt Thornveld) (Vulnerable).	Biodiversity of the mining right is characterized by patches of KZN Coastal Belt Grassland, Coastal Belt Thornveld, However, some areas regarded as CBA's in the mining right area are cultivated with Sugarcane dominating, Banana and Macadamia Nuts.

<table>
<tr><th>Name of interested and affected party</th><th>Date Comments Received</th><th>Issues raised</th><th>EAPs response to issues as mandated by the applicant</th></tr>
<tr><td>KZN Wildlife (Ezemvelo)</td><td>27 October 2022.</td><td>2. Endemic invertebrate species of conservation importance
The following endemic species are modelled to occur within the CBA areas:

<table><tr><td colspan="2">Snail species</td></tr><tr><td>Cochlitoma semigranosa</td><td>Cochlitoma semigran</td></tr><tr><td>Cochlitoma simplex</td><td>Cochlitoma simplex</td></tr><tr><td>Thukela agate snail</td><td>Thukela agate snail</td></tr><tr><td>Gulella separata</td><td></td></tr><tr><td colspan="2">Millipede</td></tr><tr><td>Doratogonus infragilis</td><td>Doratogonus infragilis</td></tr></table>
It will be necessary to establish whether the above species occur on the site during the EIA phase. If these species and/or other faunal species of conservation importance are found, Ezemvelo requests the opportunity to engage with the relevant specialist(s) to discuss the way forward.</td><td>A terrestrial specialist appointed will identify and establish whether the mentioned species are found in the mining right area. Biodiversity specialist study focusing on terrestrial environment will be forward to you for review and comment during 30 days review period of EIAR.</td></tr>
</table>

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		3. Coastal and Swamp Forest stands Coastal and swamp forest stands of conservation value and importance occur within the proposed mine lease area. Forests are protected, threatened habitats that must be excluded from mining and appropriately buffered to ensure their long-term health and persistence.	The mining right area is dominated by sugar cane production.
KZN Wildlife (Ezemvelo)	27 October 2022.	**4. Umzumbe River, Umzumbe Estuary and marine environment** As correctly noted in the scoping report, the proposed mine lease area abuts the Umzumbe River, a river identified in the National Freshwater Ecosystem Priority Areas project (NFEPA)6 as a FEPA Category B River. The DSR fails to note that the Umzumbe Estuary, an important intermittently open estuary, is situated a mere 1.6 km downstream of the proposed mine site. The marine environment is also not mentioned. Mining-related pollution has the potential to negatively impact riverine, estuarine and marine biota and ecosystem processes. Water	Mzumbe Estuary and marine environment will be addressed in the environmental impact assessment report. Marine environment specialist study will be appointed to address potential impacts on the marine environment Surface water assessment will undertake water sampling on Umzumbe River and Biota sampling to serve as baseline data for monitoring and

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		quality impacts on the riverine, estuarine and marine environments will need to be carefully investigated by a suitably qualified and experienced specialist**.** The aspects to be assessed by specialists (Section 26.3) and the scope of work needs to be refined and expanded: • The surface water assessment (Section 26.3.2) must make provision for an aquatic ecologist to (i) undertake a baseline survey of the riparian and wetland areas within the mine lease area, inclusive of the Mzumbe river, which forms the northern boundary of the site. In addition to water quality sampling, sampling of aquatic biota, including diatoms, is necessary. (This information is necessary not only to inform the EIA, but also to serve as baseline data for monitoring and auditing purposes should mining be approved).	auditing purposes should mining right be approved.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		The Biodiversity Assessment (Section 26.3.6) must be expanded. It is recommended that both faunal and floral surveys and assessments be undertaken. Faunal and floral surveys must be undertaken by suitably qualified and experienced specialists7 must be undertaken at the correct time of the year.	
KZN Wildlife (Ezemvelo)	27 October 2022.	Species of conservation significance that are known or modelled to occur on the property will need to be thoroughly searched for, considering phenology, diapause etc. The potential impacts on all Red Data and endemic species will need to be assessed and reported on. Taxon experts must be employed to undertake work wherever possible, but at the very least, must be involved in designing the survey and sampling methodology and preserving and identifying specimens. Taxon experts will need to provide recommendations where appropriate.	Joan Consulting had appointed an Ecologist to undertake terrestrial and aquatic biodiversity assessment and an appointed specialist will list species available in the mining right area within the proposed mining right area.
		A forest ecologist will need to be appointed to delineate the natural forests on the site and advise on appropriate buffers to mitigate against dust	Joan Consulting had appointed an Ecologist to undertake terrestrial and aquatic biodiversity assessment and an appointed specialist will

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		fallout etc. Mining also has the potential to impact groundwater (water depth, flow paths etc.), which may impact forest habitats, particularly swamp forest. This will need to be carefully evaluated and reported on the EIA. Engagement between specialists will be required.	advise on the buffers required for the mining activities.
		Reference must be made to the Guideline: Biodiversity Impact Assessment in KwaZulu Natal. Motivation will need to be provided for not adhering to this guideline.	A reference will be made to the Biodiversity Impact Assessment guideline during the compilation of EIAR and EMPr
KZN Wildlife (Ezemvelo)	27 October 2022.	A hydro-geological specialist assessment is imperative. A detailed assessment of the geology must be provided (inclusive of structural discontinuities, fractures, faults, dykes etc.) as this will influence the main flow paths of water and is the biggest potential route for contaminated water to follow. The geohydrological report will need to detail how monitoring of the groundwater is going to be carried out. Monitoring borehole positions will need to be determined and reported on.	A hydro-geological specialist assessment has been appointed to establish a baseline environment for the groundwater resources around the mining right area and outline a monitoring method for groundwater resources.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		It may be necessary to appoint an estuarine and marine specialist to comment on the potential risks that mining-related pollution could have on these environments.	Aquatic Biodiversity Specialist Assessment appended as appendix E13
		It is requested that Ezemvelo be given the opportunity to review and comment on the terms of reference for the specialist studies should your client wish to proceed with an EIA. It is suggested that your client, SA Lithium (Pty) Ltd, be advised that embarking on an EIA does not guarantee that environmental approval will be granted, in full or in part.	Terms of reference of the specialist to be undertaken will be sent to Ezemvelo for review and comment. SA Lithium abide by the laws of South Africa and is following all required processed to get approval although is aware that this process does not guarantee approval
		It is respectfully requested that your office confirms receipt of this letter. Please do not hesitate to contact Ezemvelo should you have any queries. Ezemvelo would like to engage closely with Joan Consulting (Pty) Ltd during the EIA Process.	Joan Consulting acknowledged receipt of these comments and indicated that they will be addressed during the environmental impact assessment and Environmental management programme.
KZN Wildlife (Ezemvelo	22 December 2022	Thank you for responding to the issues and points raised in Ezemvelo's comment letter of 27 October 2022. Please find below, Ezemvelo's response to	The comment will be communicated to the specialist.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		some of the responses provided by Joan Consulting: 1. Please note that the proposed 100m buffer provision is not in accordance with the NFEPA Guideline Document, which recommends that a buffer of 1 km protect FEPA systems. Here it is advised that the specialists be advised to recommend an appropriate buffer width, which naturally should take into account the –	
KZN Wildlife (Ezemvelo	22 December 2022	It is noted that the wetland specialist will be requested to advise/recommend an appropriate buffer width to protect the Umzumbe River and Marine Environment. It is suggested that the hydro-geologist engage with the wetland specialist to advise on appropriate buffer sizes.	The comment will be communicated to the specialist.
		It is acknowledged that a significant portion of the site has been transformed for agricultural production. The remnant natural areas that persist	The ecologist focused on the natural remnant of the forest and the specialist report will reflect that

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		on the site must be the focus of the specialist investigations.	
		If the appointed terrestrial specialist is not an invertebrate, it is recommended that a suitably qualified and experienced snail and millipede specialist be appointed to establish whether the species that are modelled to occur within the untransformed CBA areas of the site do in fact, occur on the site.	The Snail and millipede assessment has been addressed on the Terrestrial specialist report.
		The remnant forest stands on the property need to be protected. The terrestrial ecologist is advised to consult with the Ezemvelo Guideline document and a Forest Ecologist regarding forest buffers.	Ecological specialist has consulted Ezemvelo guide document for the compilation of the report.
KZN Wildlife (Ezemvelo	22 December 2022	Ezemvelo is presently not in a position to comment on the terms of reference for the specialist studies, as key Ezemvelo specialist staff are on leave. We will be in contact early in the New Year with comments.	This comment is Noted and Ezemvelo guide document has been consulted during the compilation of the specialist report.
		The potential for mining-related pollution of surface and sub-surface water is of grave concern. The	This comment will be communicated to the specialist

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		geological investigation will need to be detailed. Modelling must be detailed and site-specific. Data limitations and downfalls of the model must be reported. This study must be sufficiently detailed to identify the type and severity of the risk/impact and whether impacts can be mitigated to an acceptable level, i.e. whether mitigation can realistically be achieved.	
KZN Wildlife (Ezemvelo	12 January 2023	Following on from Jenny's email below. I note that the ESR that we have been provided with does not contain the Appendices. Please can you provide us with a copy of the appendices (these can be emailed or provided as a file transfer/download) as information contained therein may address the concerns / outstanding information that I have identified. Once received I will review and provide further comments as required.	You can download the Scoping report with Appendices on the link below https://we.tl/t-OczMmvzEwO
KZN Wildlife (Ezemvelo	18 January 2023	1. No plan showing the location and area of the activities has been provided either in the main document or as an Appendix (as required to	Please see attached original plan that is being updated to incorporate the specialist findings

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		accurately assess the environmental impacts). Please provide a proposed plan of the location and aerial extent of infrastructure, as well as the area and direction of mining.	
		2. It is mentioned on p33 of the ESR that the resource is shallow and therefore opencast mining is preferable; however, the highwall is planned to be 299m p17 in the box cut with prospecting drilling having gone to a depth of 600m – this is not a shallow mine. Is it the plan to mine the entire 1,216ha area (or virtually the entire mining right area) as opencast?	The current mining application that goes to 299m is going to be mined through open cast method. That depth is too shallow to do underground mining. Should the contour drilling show that the resource is way deeper and warrants the underground mining, the change will be licensed with associated impact assessments. 1216 ha is a mining right application boundary but the pit will area is way less than that. The current planned pit surface extent is 126ha.
		3. The mineralised strike length is stated as 520m, with the mineralized zones dipping 10-30°S. Please can you provide information on: a. Orientation of strike? b. Width of mineralization? c. Depth below surface? 200m	The depth below surface is about 200m

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		This speaks to understanding the extent of mining.	
		4. Mining is stated as including a box cut (northern face) with benching (10m) with a resulting highwall of 299m (slope angle 55-60°) then rollover mining along strike in opposite directions. Is the entire mine going to be opencast? This does not appear to make geological sense. Please provide a plan and schematics of the proposed mining method, as well as a map with the location of the box cut and mining direction/s. (p17)	See the site plan with the pit design
		5. There is no indication of direction of mining and whether depth of mining will increase along strike, especially as the mineralized zones are said to be dipping to the south.	The depth below surface is about 200m
KZN Wildlife (Ezemvelo	18 January 2023	6. The depth of mining in relation to the topography needs to be explored, especially in relation to surface water, groundwater and the river. A topographic map should be supplied in relation to the mining area with associated depth of	the geohydrological specialist will address.

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		mining. Mining is likely to be below the river level which will impact groundwater and baseflow. Final planned elevations of the mined and backfilled area need to be provided.	
KZN Wildlife (Ezemvelo	18 January 2023	7. It is noted that the ESR does not include the processing of the ore as an activity, this and the associated infrastructure (RWDs, tailings etc.) need to be included in the impact assessment and mitigation. PCDs would also be included from a layout and aerial extent, but by their nature are a mitigation measure.	Processing plant and associated impacts will be assessed on the impact assessment. Processing plant and associated impacts has been assessed in rai of this report
		8. We have limited concern over the physical processing of the ore (alternative 1: DMS); however beneficiation using the feed thickener and floatation with waste going to the tailings are of concern. a. What is the water requirement for processing – volume, quality and wastewater?	this will not be applied anymore

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		b. What minerals are used during the beneficiation process – concern for water and soil pollution (habitat)	
		9. Will a tailings facility be left on site post-closure? What is the proposed location of this facility?	The dry stack will be disposed on the waste rock dump and at the rehabilitation phase the dry tack material and waste rock dump will be used to backfill the pit – an exemption will be obtained from the DWS. Also share the dry stack process with her
KZN Wildlife (Ezemvelo	18 January 2023	We do not that the mine layout does include sensitive areas with the mine itself being close to the river. We look forward to the updated layout plan that takes account of the specialist findings.	The layout is being updated to include appointed specialist and will be included in the Environmental Impact Assessment Report and Environmental Management Program inclusive of sensitive areas.
		As mentioned below it would be beneficial to have a schematic provided of the proposed mining method with the location of the box cut and mining direction to allow for ease of understanding the project – this can be included in the EIA report.	The layout is being updated to include appointed specialist and will be included in the Environmental Impact Assessment Report and Environmental Management Program inclusive of sensitive areas.
		The limited extent of the opencast operation (126ha), the removal of the feed thickener /	The layout is being updated to include appointed specialist and will be included in the Environmental

Name of interested and affected party	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		floatation beneficiation and tailings facility from the application, and the use of the waste rock stockpile to backfill the final void are noted. Please can you provide further information on the dry stack process?	Impact Assessment Report and Environmental Management Program inclusive of sensitive areas.

8. THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE DEVELOPMENT FOOTPRINT ALTERNATIVES.

(The environmental attributed described must include socio-economic, social, heritage, cultural, geographical, physical and biological aspects)

8.1. Baseline environment - Type of environment affected by the proposed activity.

8.1.1. Geology

(NB: information in this section was obtained from the project Mining Works program)

The Highbury Pegmatites intruded the rocks of the Namaqua-Natal Province that were formed and metamorphosed during the Namaqua Orogeny at ~1200-1000 Ma. These rocks outcrop extensively in the Northern Cape and Kwazulu-Natal provinces of South Africa and are referred to as the Namaqua and Natal sectors of the Namaqua-Natal Province respectively. Geological mapping and geophysical interpretations show these two sectors form part of a 1,400 km long and 400 km wide arcuate belt that extends from southern Namibia and Namaqualand (Northern Cape) in the west to Kwazulu-Natal in the east, wrapping around the western and southern edges of the Kaapvaal Craton. See figure 15.

The Natal sector is subdivided into three tectonostratigraphic terranes, the Tugela, Mzumbe and Margate Terranes, each with distinct lithological assemblages comprising ~1200 Ma supracrustal and ~1000 Ma intrusive rocks (Figure 4 2) and Figure 4 3). The terranes also have distinct metamorphic grades that are interpreted to have accreted ~1,150-1,100 Ma, north-eastwards onto the southern margin of the Archaean Kaapvaal Craton. The terranes summarised, from north to south, are:

- The Tugela Terrane which comprises a greenschist to amphibolite grade ophiolite complex and includes rocks of island arc affinities and was thrust northward over the southern margin of the Kaapvaal Craton. It is considered to represent the obducted remnants of the “Tugela Ocean” that formed between 2,900-1,150 Ma and was then accreted onto the Kaapvaal Craton ~1,150-1,100 Ma. The terrane is made up of a series of flat southerly dipping nappes composed of layered garnet-bearing amphibolite and migmatites with subordinate quartzo-feldspathic gneisses, rare metapelites and magnetite quartzites. These nappes are intruded by a variety of mafic and granitoid bodies and formed around 1,200-1,150 Ma. A younger suite of peralkaline to peraluminous intrusions were emplaced ~1,100-1,050 Ma and comprise mainly granitoid and syenite gneisses with minor carbonatite and mafic gneisses.

The terrane is separate from the Mzumbe Terrane to the south by the Lilani-Matigulu Shear Zone (LMSZ).

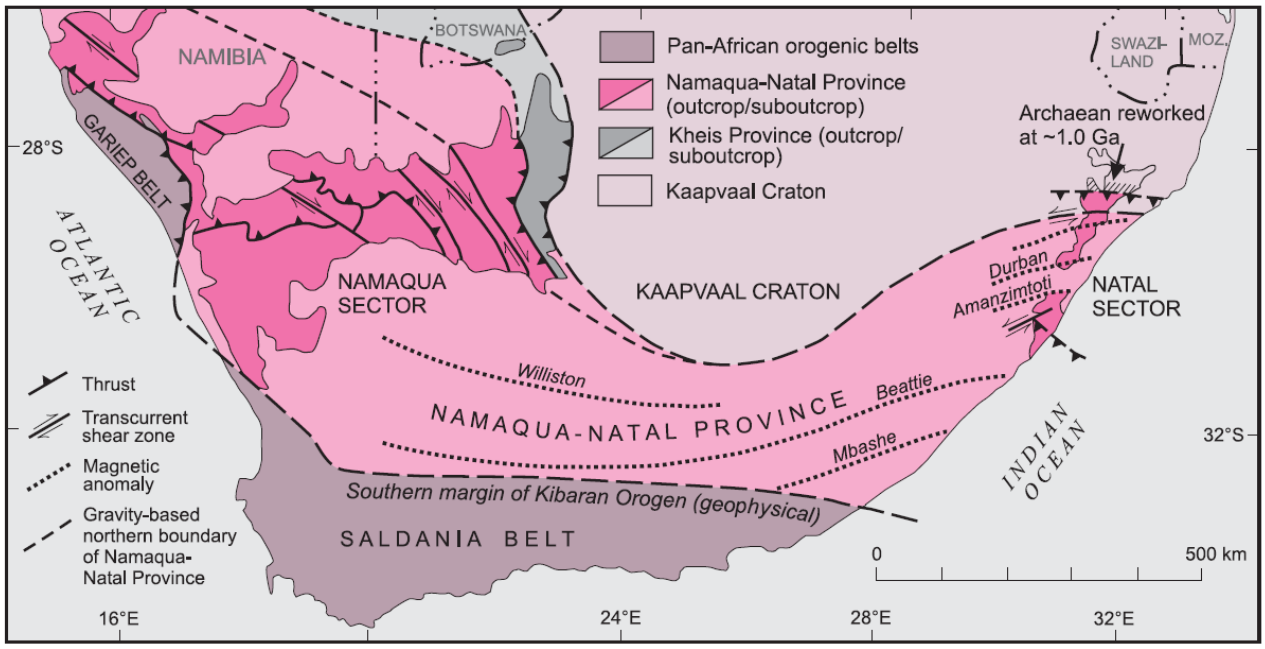


Figure 15:Geological map of the Namaqua-Natal Province.

Source: Geophysical boundaries after De Beer and Meyer (1984). Source:Cornell et al. (2006)

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comprise mainly granitoid and syenite gneisses with minor carbonatite and mafic gneisses. The terrane is separate from the Mzumbe Terrane to the south by the Lilani-Matigulu Shear Zone (LMSZ).

- The Mzumbe Terrane comprises an older amphibolite grade supracrustal gneisses known as the Mapumulo Group which comprises two formations, the Quha and Ndonyane formations. The Mapumulo Group has a volcanic-arc geochemical signature and is interpreted to be derived from volcanic and volcaniclastic rocks, ranging from basaltic to andesitic through to rhyolitic compositions, as well as greywackes derived from their erosion and minor volcanogenic exhalative cherts. The volcanic components have been dated at ~1,230 Ma. The terrane is intruded by younger voluminous pre-, syn- and late- tectonic granitoids between ~1,200-1,030 Ma. The Mzumbe Suite intrusives, dated ~1,200Ma, are considered to be the plutonic equivalents of the volcanic rocks of the Mapumulo Group and derived from partial melting of the subducting “Tugela Ocean” lithosphere. A suite if slightly younger, ~1080 Ma, mafic intrusions were emplaced during a period of crustal extension. A number of younger syntectonic, S-type peraluminous granite suites were emplaced during the final closure of the “Tugela Ocean”. The terrane separated from the Margate Terrane to the south by the Melville Thrust.

- The Margate Terrane is a granulite facies terrane that extends south from the Melville Thrust and disappears under the younger Phanerozoic cover rocks in southern Kwazulu Natal. The terrane comprises subordinate slivers of granulite facies supracrustals known as the Mzimkulu Group which includes:
- marbles, quartzites and thin amphibolites of the Marble Delta Formation;
  - ✓ semipelite gneisses, metapelite gneiss and calc-silicate rocks of the Leisure Bay Formation; and
  - ✓ two-pyroxene mafic granulite and calc-silicate rocks of the Mucklebraes Formation. A small klippe of this formation which occurs to the north of the Melville thrust, within the Mzumbe Terrane, is host to the Highbury Pegmatite.

The Margate Terrane is intruded by various intrusive suites recording a similar history to the Mzumbe Terrane. The oldest being the I-type Banana Beach Gneisses and pyroxene granulites of the Munster Suite which have calc-alkaline affinities and considered to have formed in a volcanic-arc environment. The similarly aged bimodal Turtle Bay Suite comprises two-pyroxene granulites and felsic enderbites along the Melville Thrust and have tholeiitic to calc-alkaline affinities which were emplaced at deep crustal levels. The youngest suite of

intrusive rocks, with dates ~1,100 Ma, is the Margate Suite which comprises S-type granites. These are represented by anhydrous garnet leucogranites and charnockites. The spodumene bearing Highbury Pegmatite is also considered to be a member of the Margate Suite hosted within a synformal klippen structure of Mucklebraes Formation supracrustal rocks in the southern end of the Mzumbe Terrane.

Following the juxtaposition of the various terranes and the arc-continent collision with the Kaapvaal Craton the Mzumbe and Margate terranes were intruded, ~1,060 Ma, by voluminous late-tectonic plutons and batholiths of rapakivi-textured granitoids and charnockites of the Oribi Gorge Suite. See figure 16 and 17.

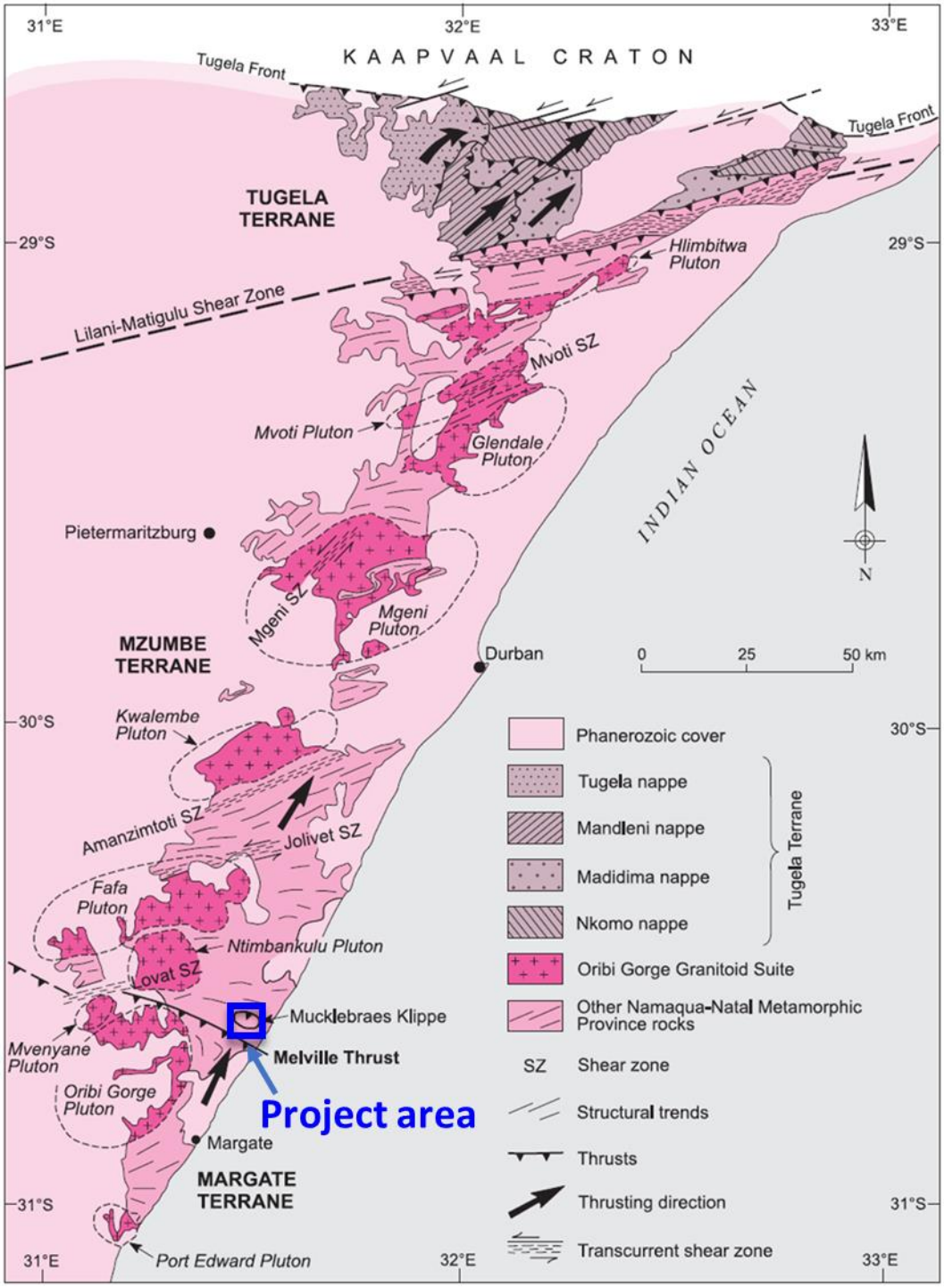

Figure 16:Simplified geological map of the Natal Sector of the Namaqua-Natal Province.

Source: Cornell et al. (2006)

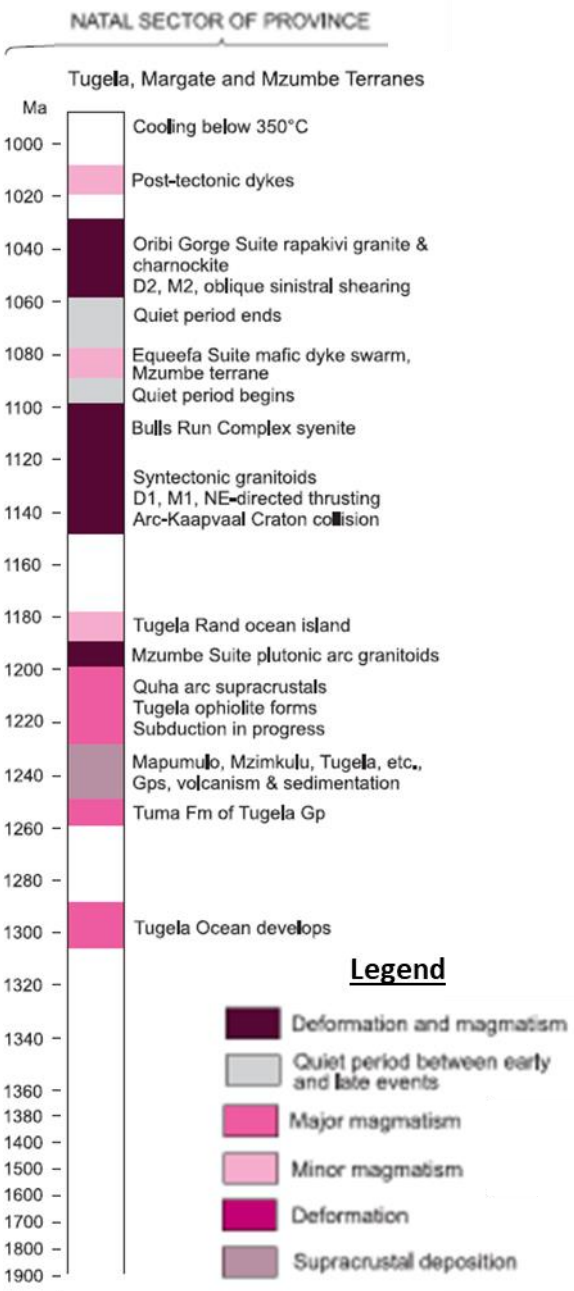

Figure 17:Summary stratigraphy and events of the Natal Sector.

Source: Cornell et al. (2006).

Regional Mineralisation

The Highbury Pegmatites are the only known lithium bearing pegmatites in the Natal Sector of the Namaqua-Natal Province.

Local Summary of Geology

The following is summarised from Thomas et al. (1994) unless otherwise referenced.

The Highbury Pegmatite is hosted in klippen of granulite facies mafic gneisses and schists of the Mucklebraes Formation within the Mzumbe Terrane. It is considered to have been

emplaced ~1,100 Ma and is bound on its base by a zone of ductile shearing. Thomas et al. 1994) interpreted that the pegmatites they were intruded into the host lithologies and folded into an open, east-west trending periclinal synform and foliations of the host gneisses and pegmatite-gneiss contacts dip centripetally at shallow angles (<30°) to the synform's axis (Figure 17 and Figure 18). Note the location of the Mzumbe borehole, which was the first exploratory hole drilled into the pegmatites by the Geological Survey of South Africa, please see 4.5.1.1 for results and downhole descriptions. Whilst the pegmatites outcrop in a broadly oval shape measuring approximately 4 km by 2 km, around a west-northwest – east-southeast axis current exploration by SA Lithium suggests a fracture control on the pegmatite distribution and that the pegmatites are not folded.

The pegmatites are considered to be slightly transgressive and occupying a slightly lower structural level to the west. The hanging and footwall (and parting) contacts between the pegmatite and host rock are sharp and sometimes break along slickensided planes that may be mylonitised and serpentinised (Trumpelmann and Kruger, 2002).

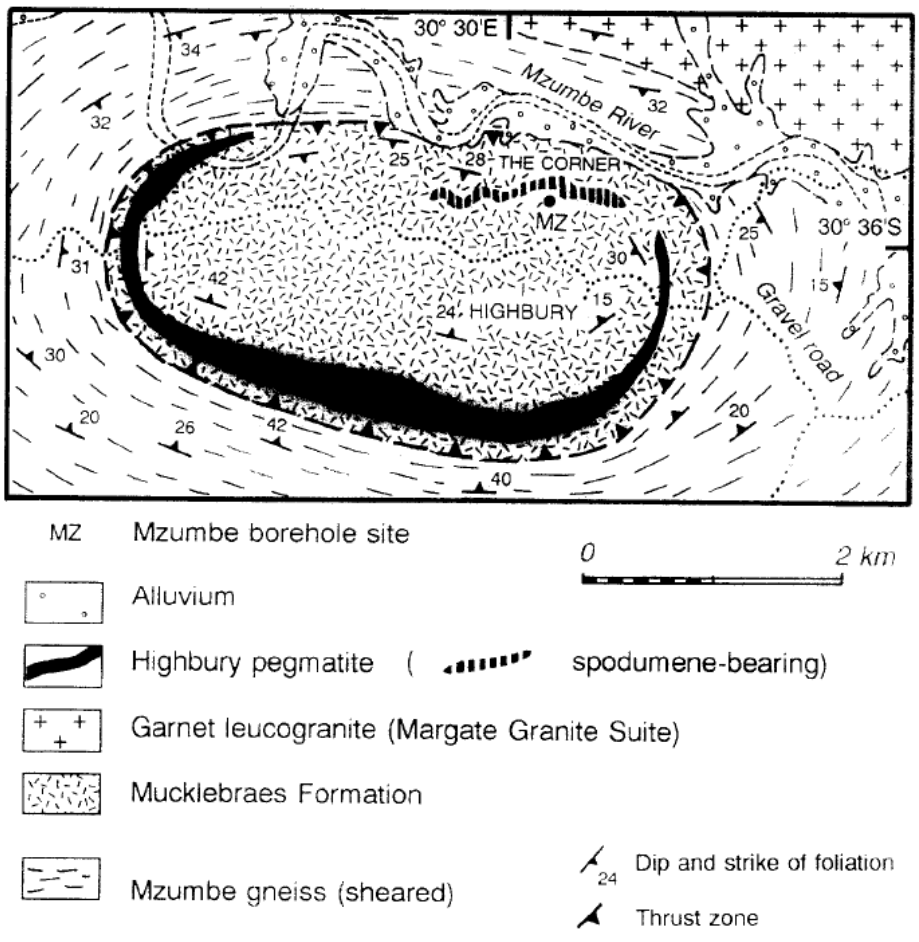

Figure 18:Geological map of the Highbury Pegmatite.

Source: Thomas et al. (1994).

The outcrops of the pegmatite are sparse except along the densely vegetated, NE of the klippen, where it locally forms prominent 20-m -high white cliffs, on the farm The Corner, overlooking the Mzumbe River Valley where a pegmatite outcrops for a strike length of ~1 km. However, the intermittent nature of the outcrops along consistent structural levels suggests that the thickness of individual pegmatite sheets may vary along strike. Thomas et al. (1994) considered this variability due to tectonic stretching resulting in the formation of mega-boudins which are expected to be elongated along the local S- to SW plunging stretching lineation direction. However, this could also be a function of variable dilation of the fractures into which the pegmatites intruded.

Geologists from CSA Global proposed that the “intermittent nature of the outcrops” may be related to a series of stacked shallowly dipping echelon fracture sets into which the pegmatites were intruded.

The spodumene bearing pegmatite as mapped by Thomas et al. (1994) is shown in Figure 18 to be restricted to the north of the klippen on the farm The Corner. However, the current exploration has found the spodumene-bearing pegmatites to be far more widespread and present in the east and south of the klippen, where they have been intersected in a number of the recently drilled holes (Figure 18).

The following descriptions are for the Highbury pegmatites present on the farm Corner. These pegmatites were the focus of the recently completely resource drilling campaign and the focus of this document going forward.

The Corner Pegmatites

The pegmatites are divided into four distinct groups based on thickness and spodumene/lithium content namely (from bottom to top) the Basal Zone, Lower Zone, Main Zone and Top Zone pegmatite groups (Figure 64). All the pegmatites are slightly transgressive relatively to the host rock fabrics (Trumpelmann and Kruger, 2002).

The Basal Zone (BZ) pegmatites

The pegmatite(s) of the Basal Zone outcrop in the north and west of The Corner and are largely unmineralized with respect to spodumene based on the work done by Thomas et al. (1994). Only drill hole (SL21) in the most recent drill programme intersected this pegmatite.

Spodumene was largely absent in this intersection of the BZ with only scattered clusters of SQI identified within the first 2 meters from the top contact.

The Lower Zone (LZ) pegmatites

This zone ranges from ~6m in the east to ~17.5m thick in the west and is made up of between one and four pegmatites separated by host rock partings up to 13m thick. These pegmatites are well mineralised with respect to spodumene, as SQI.

The Main Zone (MZ) pegmatites

This zone comprises one or two pegmatites with a discontinuous parting of the gneiss host rock ranging from ~1.5m to ~17m (when present). The partings' lateral continuity is variable ranging from absent to ~17m wide. This is particularly well illustrated in small-scale mine pit that is excavated into this pegmatite. These pegmatites also thicken to the west. These pegmatites are also well mineralised with respect to spodumene, as SQI.

The Top Zone (TZ) pegmatites

These are stratigraphically the topmost pegmatites and are comparatively thin (up to ~6m thick), laterally discontinuous and lenticular making correlation between boreholes difficult. The IDC found the spodumene mineralisation to be "poor". The drilling completed by SA Lithium has confirmed this although there are some patches of spodumene mineralisation.

8.1.2. Geochemical composition

A Geochemical Assessment for the proposed lithium mine was undertaken and a report was made available in November 2022. The assessment focused on the potential for leaching of the contaminants of concern and the acid-generating potential. The executive summary of the assessment captures the findings clearly and is reflected below.

The geochemical assessment included the review of available geological information. The different lithologies/rock types of the waste materials were identified, and composite samples were prepared for geochemical testing. Test work included elemental composition, 1:4 reagent water leach testing; 1:20 Synthetic Precipitation Leach Protocol testing (SPLP); sulphur and carbon speciation; quantitative mineralogy (x-ray diffraction), acid-base accounting (ABA), and net-acid generation (NAG) testing.

The bulk of the waste rock comprises massive gneiss (approximately 50%) and sheared, foliated or migmatitic gneiss (35%). A portion of the waste rock (9- 11%) is comprised of gneiss with minor pyrite mineralisation, as well as a small portion of overburden (4%). The ore material is comprised of pegmatite from the Main and Lower Zones. Ore material will also be stored on the waste rock dump (approximately 9000 kg of gneissic waste to 800kg of pegmatite is anticipated at this project stage).

In terms of acid generation risk, it was found that:

- The massive gneiss, sheared, foliated or migmatitic gneiss, overburden, and the ore material, were considered low risk for acid generation due to either
  - the material having both a low sulphide abundance (<0.2%) and a low net-acid generation (NAG) value, therefore the material is unlikely to sustain acid release in the long term,
  - the material having a significant sulphide abundance, but that sulphide abundance was not attributed to acid-generating sulphide minerals, as confirmed by the NAG testing which indicated that the material was non-acid generating.
  - The pyrite mineralised material (9-11% of the total waste rock) has a medium to high risk of acid generation in the long term. This was due to a significant sulphide abundance and low neutralising potential.

- Taking into account the ratios of the waste rock material (i.e. the pyrite material comprises only 9-11% of the waste rock), the combined net-acid generation value is estimated to be 3.9 kg/t which is considered to be low. The presence of silicate minerals may offer some buffering of acid generation; however, the material-specific relative rates of oxidation to neutralisation are uncertain

Overall, the metal leaching risk of the material is considered to be low due to generally low concentrations or mobility of potential pollutants. However, the following potential pollutants were identified which should be incorporated into monitoring requirements to assess baseline and ongoing concentrations:

- Iron, aluminium and manganese, likely in the form of colloidal oxyhydroxides, were released from the material.
- Detectable to low concentrations of copper, arsenic, and nickel were released from one or more of the materials in concentrations exceeding South African drinking water or discharge guidelines

Arsenic species generally have low mobility in natural systems when iron-hydroxides and clay materials are present. Mercury was mobilised in one of the leaching experiments exceeding IFC effluent guidelines, though within drinking water guidelines.

The leaching profile may change during the oxidation of the material. Longer-term leaching profiles can be assessed through kinetic column experiments.
The waste rock was classified in terms of the South African NEMWA Waste Classification and Management Regulations (GN634 of 2013). A modelled sample comprising the mixture of the composite samples, taking into account their relative abundance, was classified. The table below summarises the classification and recommended management measures for the material.

Table 11: Waste Classification of the Highbury Rock Material

Total concentration threshold Exceedances	As, Ba, Cu, Hg, Mn and V exceed TCT 0 (same for waste rock and waste rock combined with pegmatite)
Leachable concentration threshold exceedances	None (All concentrations from the 1:20 leach test were within limits)
Classification according to GNR 635	Type 3
Recommended classification	Type 4 (provided that additional management measures are in place)
Recommended classification measures	➢ Class D engineered base (or similar) ➢ The residue stockpile should be shaped to encourage runoff, and water runoff should be captured and analysed before releasing to the catchment. ➢ Should exceedances be noted, water can be captured, evaporated, or reused on-site.

There were no tailings samples to be analysed and the Lithium processing method is the DMS process with the waste released as dry cakes. Regarding the process waste, the geochemical assessment reported the following:

- Tailings will likely be considered low risk for acid generation, given the low abundance of sulphidic material in the target ore.

- The leaching profile of the material would be similar to the ore material. However, the introduction of fatty acids in the further recovery (if considered) may introduce an organic loading to the material. The presence of organic acids in the material will change the leaching characteristics and may mobilise a higher portion of trace metals by forming complexes.
- The recommended management measures for a tailings facility depend on whether a dry or wet facility is considered. Should the material from the DMS facility be stored as a wet storage facility, a Class C liner (as per South African NEMWA Norms and Standards) would likely be recommended by the Technical Designer or a liner similar to that of Class C. This is advised to protect groundwater resources from seepage from the wet disposal facility. A dry-stacked DMS tailings facility has a lower potential for seepage with less free water available. An alternative facility (similar to Class D) with surface water management measures could be motivated as the material poses a lower geochemical risk in terms of its acid generation and metal leaching potential. A geohydrological seepage model should be considered in the motivation.

A Complete Geochemical report is attached as **Appendix 1**

8.1.3. Topography

The KwaZulu-Natal province is well-known and characterised by its undulating topography. The municipality being a coastal strip, the topography generally falls towards the coast and is segmented by many water courses (streams/rivers) resulting in numerous hills and valleys as well as very flat areas along the coast. The agricultural pattern within the area is primarily due to the undulating topography, which prescribes the available land parcels out of the valley lines and along other major structuring elements.

The natural landscape of the study area is typically characterised by a rolling topography which is created by the mountains, rivers, such as the Mzumbe and Kwamulakaka Rivers, and the ocean to the east of the study site. The vegetation cover is dense on the lower lying areas and along the rivers, the vegetation higher up on the mountains are mostly grass with clumps of trees scattered throughout the area. According to Mucina and Rutherford (2009) the vegetation of the study area is a combination of the KwaZulu Natal Coastal Belt Grassland and the KwaZulu Natal Coastal Belt Thornveld. Some of the natural vegetation, specifically the southern and the north-eastern section of the study area, has been removed and replaced by sugarcane fields. (Visual Impact Assessment, March 2023)

The highest on-site topographical elevation point was recorded was 200 mamsl (metres above mean sea level) and the lowest point at 50 mamsl. See **Figure 19** for a topographical map below.

A Visual Impact Assessment is attached as **Appendix 2**

8.1.4. Soils

The Land Type data was used to obtain generalised soil patterns and terrain types for the site. Land Type data exists in the form of published 1:250 000 maps. These maps indicate delineated areas of similar terrain types, pedosystems (uniform terrain and soil pattern) and climate (Land Type Survey Staff, 1972 - 2006).
The Highbury project area falls within land types Ab155, Fa601, and Fa582. The Ab155 land type is dominated by the scarp and midslope landscape positions and consists largely of Glenrosa and Hutton soil forms. The average slope for this land type is steep with slopes ranging from 2% to 40%. Clay content is estimated at between 15% and 40%.

The Fa601 land type is dominated by the scarp and midslope landscape positions and consists largely of shallow rocky soils of the Mispah and Glenrosa soil forms. The average slope for this land type ranges from 2% to 40%. Clay content is estimated at between 5% and 40%.

The Fa582 land type is dominated by the midslope and valley bottom landscape positions and consists largely of Hutton or Glenrosa soil forms in the midslope, and Katspruit soil forms in the valley bottom (see Figure 20). The average slope for this land type steep with slopes ranging from 4% to 100%. Clay content is estimated at between 10% and 40%.

The average soil depth according to the land type data for the project area is between 300mm and 900mm. The area earmarked for mining ranges from 600mm to 900mm in depth. (Soils, Land Capability, and Land Use Specialist Assessment report, 07 April 2023).

A complete Land use, capability and agricultural assessment report is attached as **Appendix 3**

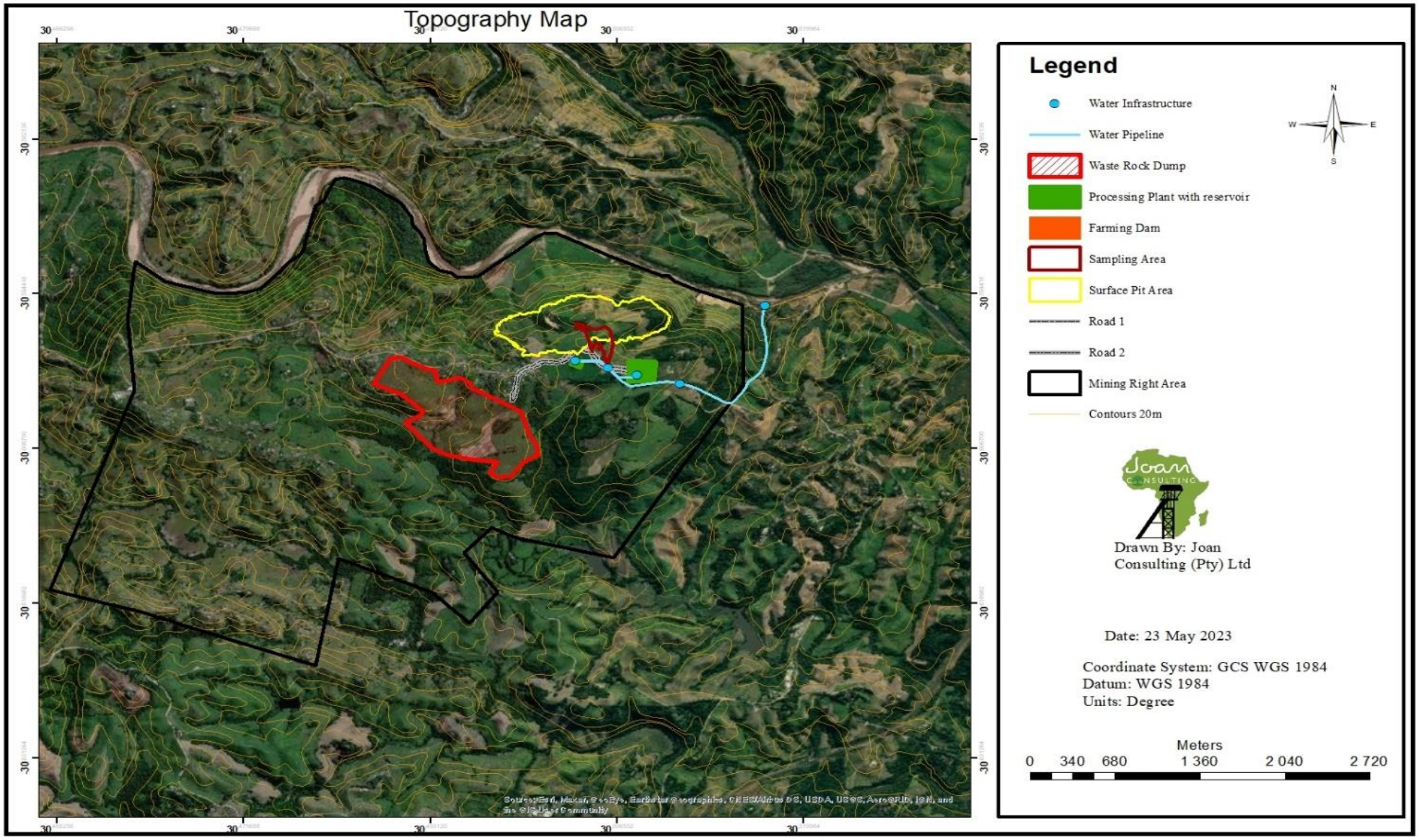

Figure 19: Topographical Map

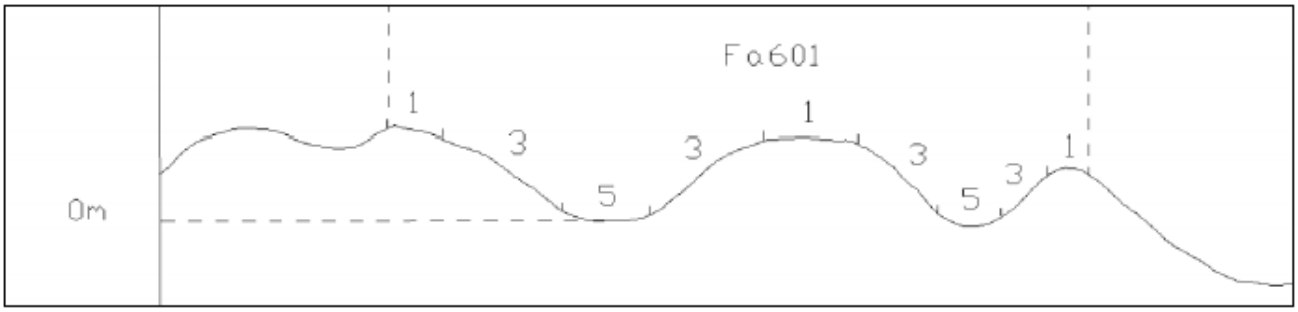

Figure 8-6: Hillslope catena for land type Fa601.

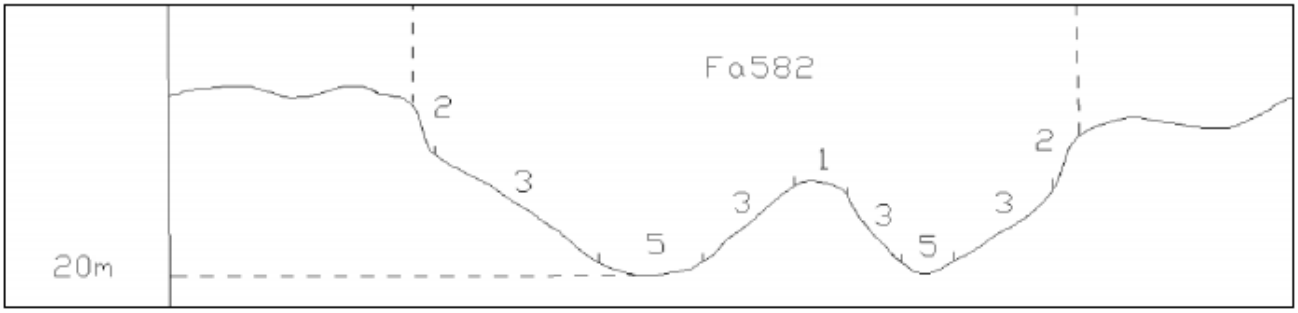

Figure 20:Hillslope catena for land type Fa582.

The soil capability for the overall project area ranged from Low to High. The area earmarked for the mining operation was dominated by Moderate-High to High soil capability. The remaining areas to the south was dominated by Low-Moderate ratings.

The land capability for the overall project area ranged from Low-Very Low to High-Very High. The area earmarked for the mining operation was dominated by Moderate to Moderate-High land capability. The remaining areas to the south was dominated by Low to Moderate ratings

The following soil forms were identified on-site for the Highbury project area (see Table 9-1);

- Mispah (Orthic topsoil over hard rock);
- Glenrosa (Orthic topsoil over a lithic horizon);
- Tubatse (Orthic topsoil over a Neocutanic B-horizon overlaying a lithic horizon); and
- Tukulu (Orthic topsoil over a Neocutanic B-horizon overlaying a Gleyic horizon).

The project area was mainly dominated by two soil forms, namely the Glenrosa and Tubatse soil form. Some areas did have Hutton soils present, but these were grouped with the Tubatse soil form as they represent similar land capabilities and land uses. The steeper slopes were classified as Glenrosa as soil transport downslope is the main soil forming process. The flatter

slopes and midslope regions showed accumulation of soil processes resulting in deeper soil profiles. These soils were classified as the Tubatse soil forms. The valley bottom areas showed accumulation of soils as well as the accumulation of moisture and the Tukulu soil form was classified in these areas.

The Glenrosa soil forms all fall into the non-arable category, with the land capability classes Being classified as class VI. The Tubatse soil forms that are deeper than 300mm were classified as being class III land capability. These soils are best utilised for moderate cultivation. The Tukulu soils have a moisture restriction for cropping at around 300mm to 600mm and therefore were classified as class IV (light cultivation or grazing).

8.1.5. Biodiversity

(NB: Information in this section (10.2.4.) was obtained from the project Terrestrial Ecological Assessment Report dated 17 March 2023)

The study area is located within the Grass Biome which is the second largest Biome in southern Africa after the Savanna biome. Biomes can further be divided into vegetation units, with the study area forming part of the Northern KwaZulu Natal Coastal Belt and the KwaZulu-Natal Coastal Belt Thornveld. **Figure 21** show the vegetation map of the area

8.1.5.1. KwaZulu-Natal Coastal Belt Grassland

The KwaZulu-Natal Coastal Belt Grassland is distributed in KwaZulu-Natal Province: Long and in places broad coastal strip along the KwaZulu-Natal coast, from near Mtunzini in the north, via Durban to Margate and just short of Port Edward in the south. Altitude ranges from about 20–450 m. It highly dissects undulating coastal plains which presumably used to be covered to a great extent with various types of subtropical coastal forest (the remnants of one of which are described in Chapter 12 as Northern Coastal Forest). Some primary grassland dominated by Themeda triandra still occurs in hilly, high-rainfall areas where pressure from natural fire and grazing regimes prevailed. At present the KwaZulu-Natal Coastal Belt is affected by an intricate mosaic of very extensive sugarcane fields, timber plantations and coastal holiday resorts, with interspersed secondary Aristida grasslands, thickets and patches of coastal Thornveld.

This vegetation type is considered Endangered with a conservation target of 25%. Only very small part statutorily conserved in Ngoye, Mbumbazi and Vernon Crookes Nature Reserves. About 50% transformed for cultivation, by urban sprawl and for road-building.

8.1.5.2. KwaZulu-Natal Coastal Belt Thornveld

The KwaZulu-Natal Coastal Belt Thornveld is also distributed in the KwaZulu-Natal Province, from near Mandini in the north to Oribi Gorge in the south. This vegetation unit occurs on the Steep valley sides and hilly landscape mainly associated with drier larger river valleys in the rain shadow of the rain bearing frontal weather systems from the east coast. Bushed grassland, bushland and bushland thicket and open woodland. The vegetation unit is conserved Statutorily conserved in Harold Johnson Nature Reserve. The vegetation map is attached as figure 21 overleaf.

8.1.5.3. Site Vegetation Assessment

The (Pretoria Computerised Information System) PRECIS list of plants recorded in the quarter degree grid squares were obtained from SANBI. This list was consulted to verify the record of occurrence of the plant species seen on the site. A desk-top study of the habitats of the red-listed and orange-listed species known to occur in the area was done prior to site assessment. Visual assessment was used to assess the abundance of floral and faunal species. The vegetation types of Mucina & Rutherford (2006) were also used as reference but where necessary communities are named according to the recommendations for a standardized South African syntaxonomic nomenclature system (Brown, L.R., Du Preez, P.J., Bezuidenhout, H., Bredenkamp, G.J., Mostert, T.H.C., and Collins, N.B. 2013). By combining the available literature with the survey results, stratification of vegetation communities was possible. (Terrestrial Ecological Assessment Report, 17 March 2023)

The majority of the area proposed for the mining structures and infrastructures (mine pit, waste rock dump, office and laydown area) has been disturbed due to sugarcane plantation (major disturbance), mining as well as human settlements. Portions with natural vegetation still exist and more of it along the watercourses.

The cultivated or disturbed section of the site is dominated by Saccharum officinarum (Sugarcane), with species such as Lantana camara, Datura stramonium, Agave sisalana, Strelitzia Nicolai, Senna didymobotrya, Psidium guava, Rubus cuneifolius. Towards

settlements species such as Ipomea purpurea, Tagetes minuta, Amaranthus hybridus, Aloe marlothii, Tecoma capensis, Listea glutinosa, Caesalpinia decapetala, Senna didymobotrya, Erythrina lysistemon, Acacia mearnsii, Opuntia ficus are present. (Terrestrial Ecological Assessment Report, 17 March 2023)

8.1.5.4. Site Fauna survey

Majority of mammals and reptiles are either very secretive, nocturnal, hibernate (reptiles), migrate (birds) or prefer specific habitat so sampling and identification was limited. The proposed mining right area is located outside important bird areas. (Terrestrial Ecological Assessment Report, 17 March 2023).

8.1.5.5. Site Mammals Assessment.

Records of all mammal species recorded in the four quarter degree grid squares were obtained from the Virtual Museum (VM) website of the Animal Demographic Unit of University of Cape Town prior to the site visits. The site assessment was conducted for mammal species diversity by direct and indirect methods using mammal sightings, burrows, holes and also verified by mammal book (Skinner and Chimimba, 2005). No trapping was conducted during the field survey. (Terrestrial Ecological Assessment Report, 17 March 2023)

During site survey, no red data mammals have been confirmed for the study areas. The animals encountered include Bos Taurus (Cow), Chlorocebus pygerythrus, Equus caballus, Dendrohyrax arboreus, Cephalophus natalensis, Tragelaphus scriptus (droppings used as indicators), and Capra aegagrus hircus (Goat).

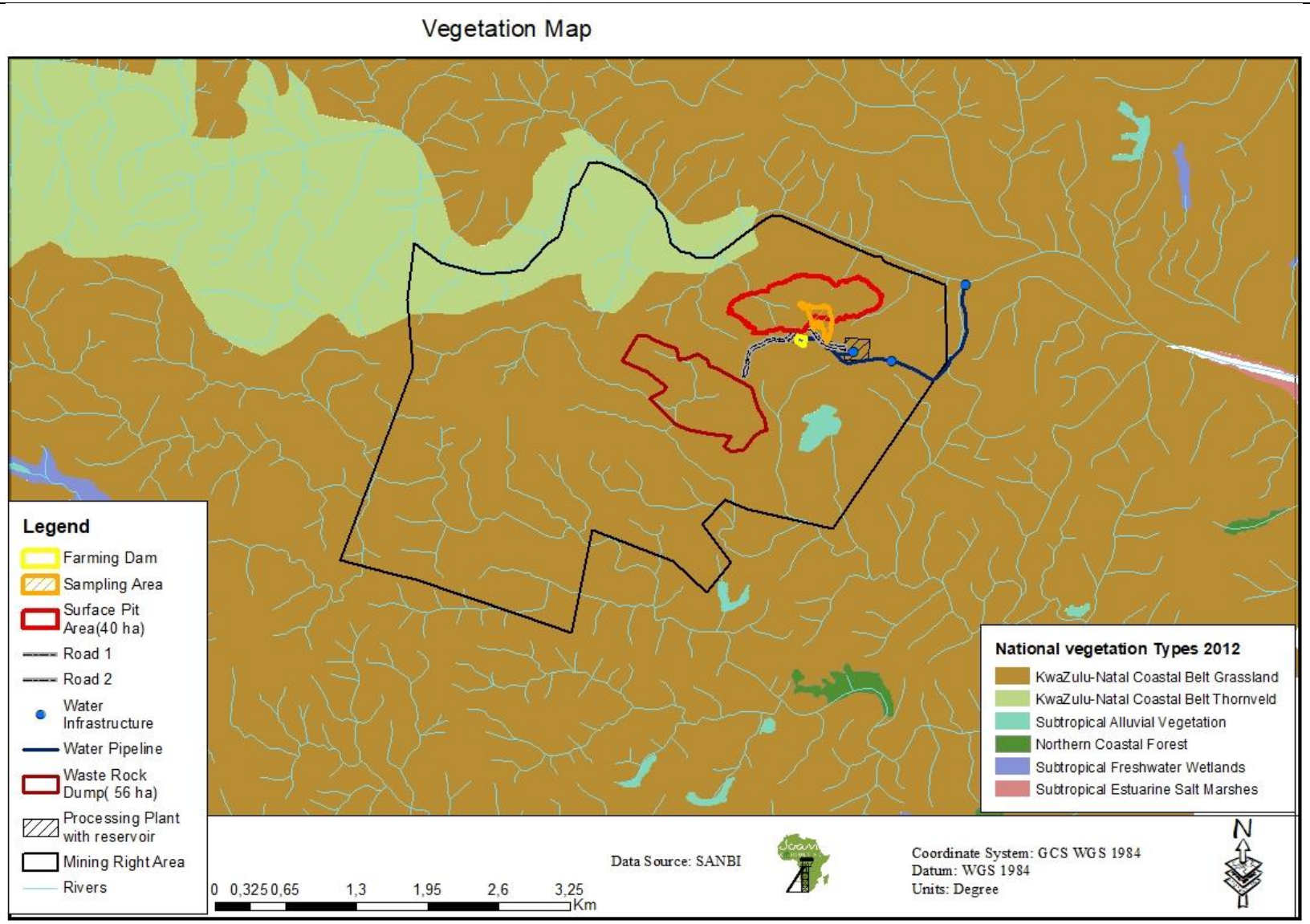

Figure 21: vegetation map

8.1.5.6. Critical Biodiversity Areas (CBA)

The primary purpose of CBA's is to inform land-use planning and the land-use guidelines attached to CBA's aim to promote sustainable development by avoiding loss or degradation of important natural habitat and landscapes in these areas and the landscape as a whole. CBA's can also be used to inform protected area expansion and development plans. (Anon, 2008).

According to the KZN CBA map 2016 (data), sections of the site is located within CBA irreplaceable. CBA irreplaceable areas are areas that are the most optimal to meet the biodiversity conservation targets while avoiding high-cost areas as much as possible. The other section of the site is not classified as it can be seen on the figure below. A small portion of the surface mining area (the pit) extends into the CBA, the plant area is a CBA but destroyed by the farm stead, and the entire structures and infrastructures are located outside ESA as well as CBA areas. The bigger portion is also regarded as a highest biodiversity area prone to mining in terms of the mining and biodiversity guideline map. See **figure 22** below for the sensitivity map that shows the location of the CBA.

Terrestrial Ecological Assessment Report is attached as **Appendix 4**

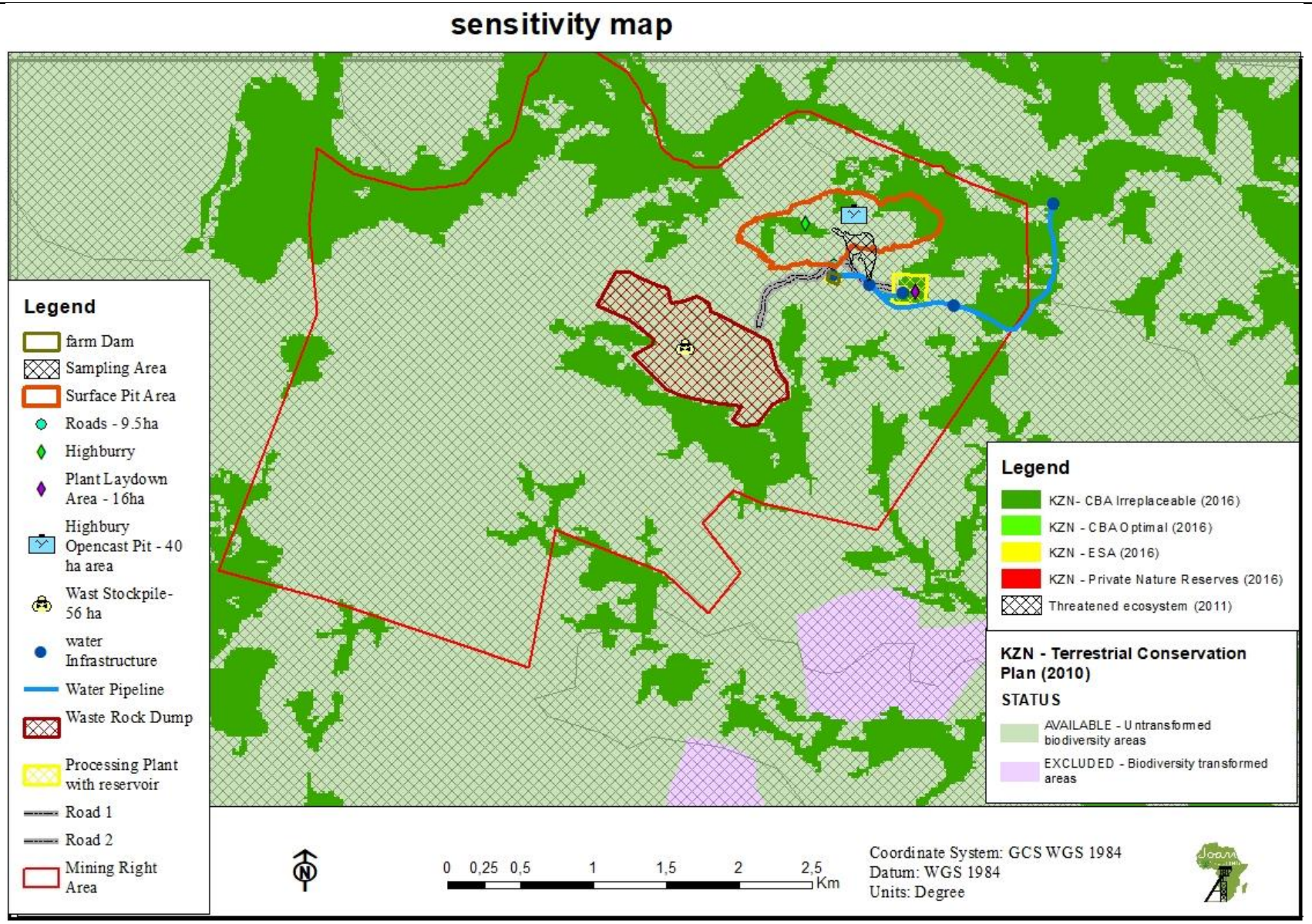

Figure 22: Terrestrial Sensitivity Map

8.1.6. Surface water

8.1.6.1. Catchment Management Area.

8.1.6.1.1. Regional *Hydrology*

The location of the proposed mine occurs within Quaternary Catchments U80A and U80C within the Mvoti to uMzimkhulu Water Management Area (WMA 11). which is situated about 8 km upstream of the Umzumbe River mouth from the India Ocean along the south coast of Kwa Zulu Natal Province.

The site is hydrologically situated in the downstream-most quaternary contributing catchments of the greater Umzumbe River (U80C) and a tributary of the Intshambili River of the southern catchment boundary of U80C in U80A. The main stem of the Umzumbe River originates in the escarpment approximately 71km northwest of Umzumbe village, about 8km upstream of Mhlabatshane Dam on the west and about 10 km upstream of Thuthuka village, an area known to have high forestry activities. See **Figure 23 and 24**.

The project area lies on a quaternary catchment divide but the bulk of the activities such as site access roads (haul roads), waste rock dumps, mine plant and laydown area will lie in U80A thus draining predominantly towards Intshambili River system to ultimately drain into the Indian Ocean at Pumula. Only 800m of the proposed haul road will drain into the Umzumbe River U80C, which is also the entry into the opencast area.

8.1.6.1.2. *Local Hydrology*

Based on the freely available SRTM elevation data, the site was delineated into hydrologically discrete sub-catchments of approximately 0.1 to 0.8 km2 sizes. The site infrastructure is drained by a total of eight sub-catchments, with four sub-catchments draining into U80C and four sub-catchments draining into U80A. These are sub-catchments or groups of sub-catchments which play a direct role in changing the hydrologic characteristic of the post-development flows around the site due to the proposed mining activities.

The four sub-catchments draining towards the south into Intshambili River all confluence and drain into a downstream dam. The other sub-catchments all drain into the Umzumbe River. The proposed mine will either directly or indirectly change the flow characteristics of these

catchments. (Baseline Hydrology, Flood line, Stormwater Management Plan and Impact Assessment Report, 23 February 2023)

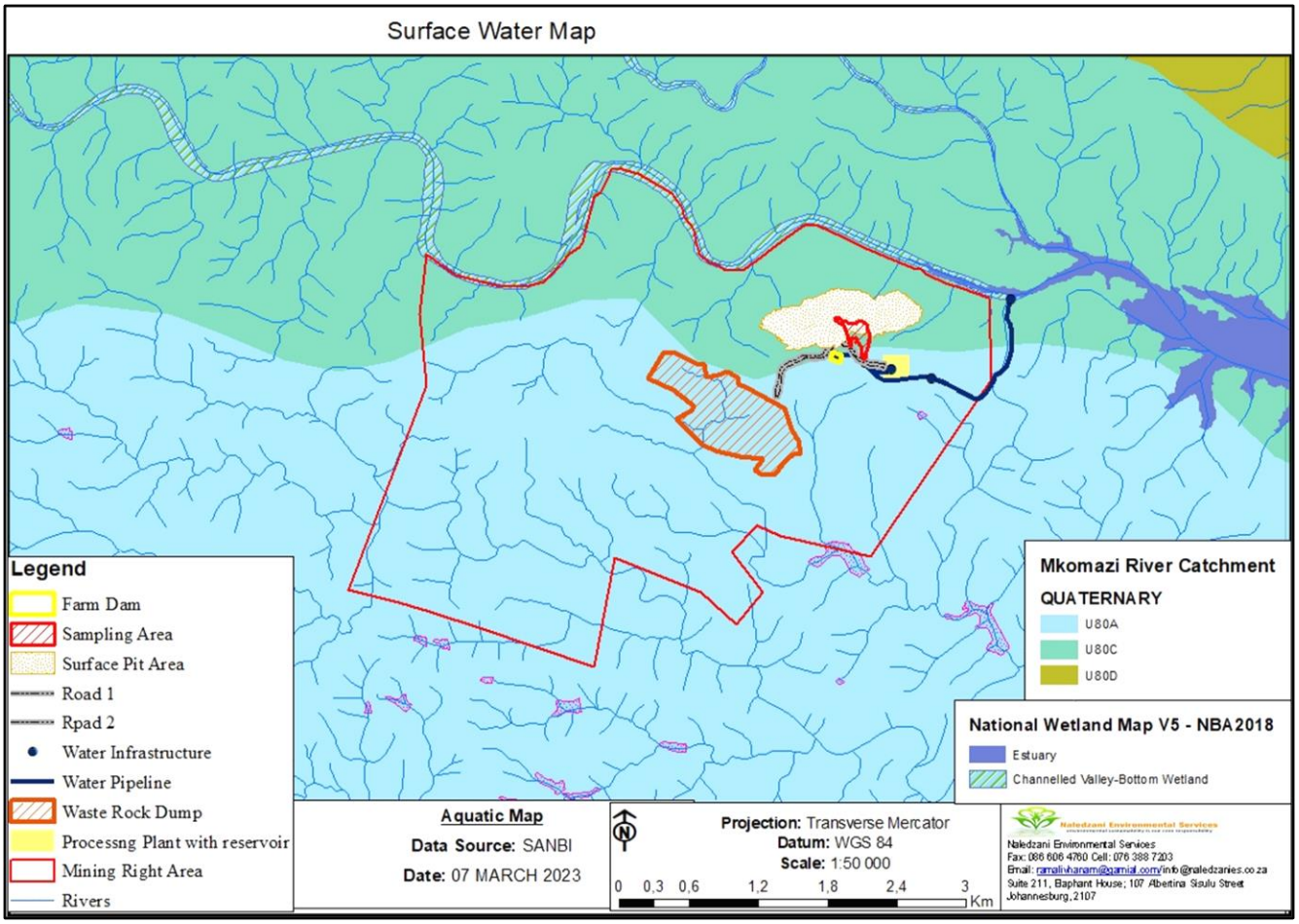

Figure 23:Nkomazi River Catchment map.

8.1.6.2. Stormwater Management Plan

The main objective of the stormwater management plan (SWMP) is to satisfy the legislative requirements as outlined by the National Water Act (Act 36 of 1998) and local bylaws

Personal Computer Storm Water Management Model (PCSWMM) was used as a flood analysis model to determine peak discharges at each discrete sub-catchment. PCSWMM is a dynamic rainfall-runoff simulation model, based on the SCS-SA method, used for single event or long-term simulation of runoff quantity

Mitigation measures provided in the EMPr will provide ways for stormwater runoff from the mining area to be managed appropriately, i.e., as per the Department of Water Affairs (DWA) Best Practice Guidelines A1 (2006), which in turn are based on the requirements of General Notice 704 (GN 704) of the National Water Act (Act 36 of 1998). (Baseline Hydrology, Flood line, Stormwater Management Plan and Impact Assessment, April 2023).

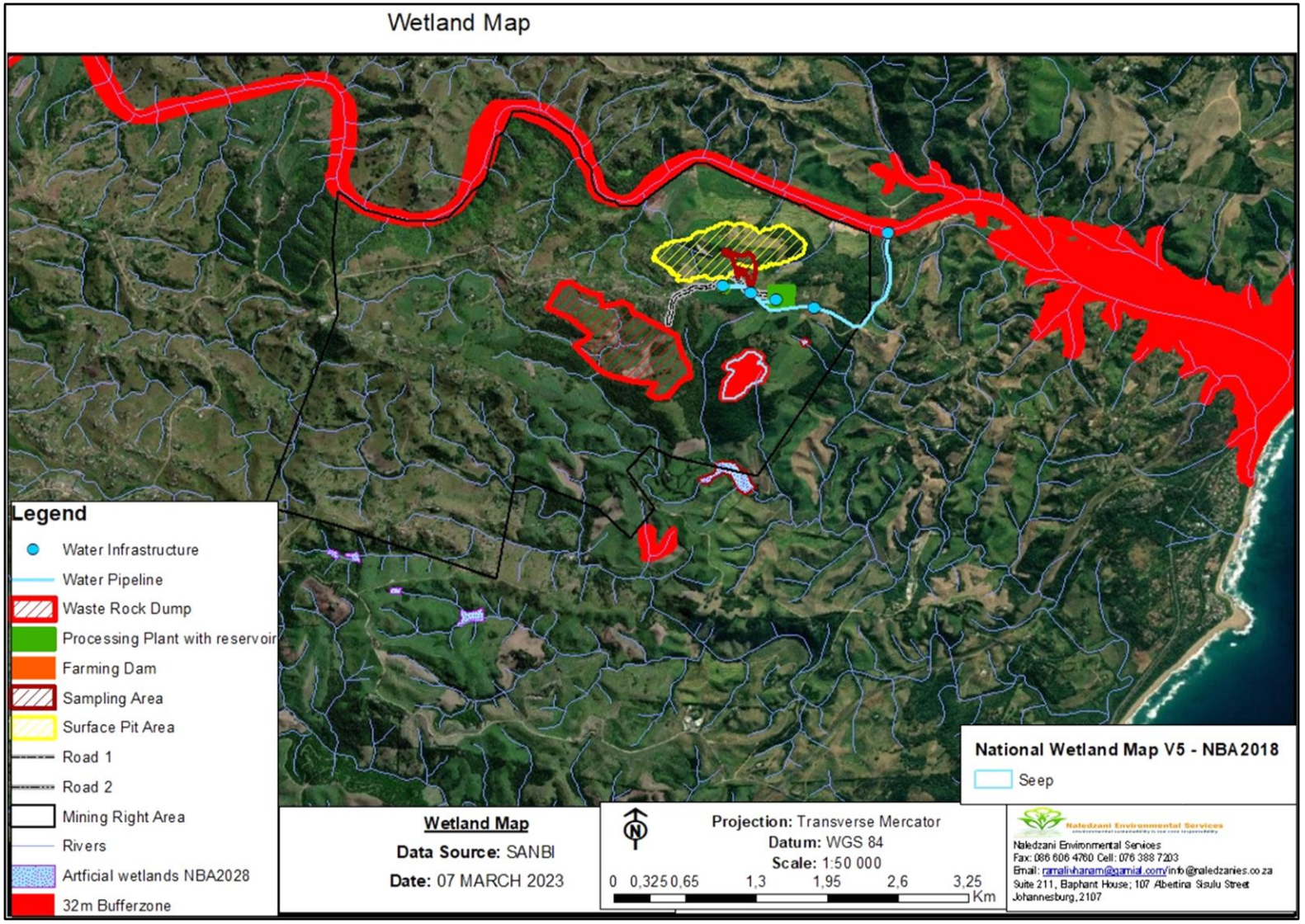

Figure 24:Wetland map.

8.1.6.3. Flood line

The flood line delineation to determine the 1:50 and 1:100-year flood-line for the streams around the proposed development area have been undertaken as shown in the figure 24 overleaf.

The HEC-RAS Model (US Army Corp of Engineers) was used to undertake the one-dimensional hydraulic modelling of the drainage lines in the respective catchment areas to determine the extent of the 1:50 and 1:100-year flood lines.

Flood line Results

The result shows the extent of the 1:50-year and 1:100-year flood line results for all drainage lines contributing flows into the UMzumbe River, the incoming peak flow of the UMzumbe River itself, and those contributing flows draining into the Intshambili River and its tributary.

The modelled flood lines associated with the upper reaches of Intshambili River (catchment 1) are currently of strategic importance as they feed the two instream dams further downstream.

Most upstream drainage lines are associated with minimal flood line spreads from the left to the right banks, with ten of them (seven cut by the opencast area) subject to be cut-off from their downstream catchments due to the proposed opencast pit and waste rock dump. Catchment 2 is currently associated with a wetland, making the flood lines. (Baseline Hydrology, Flood line, Stormwater Management Plan and Impact Assessment, April 2023).

The Hydrological Impact Assessment report is attached as **Appendix 5**

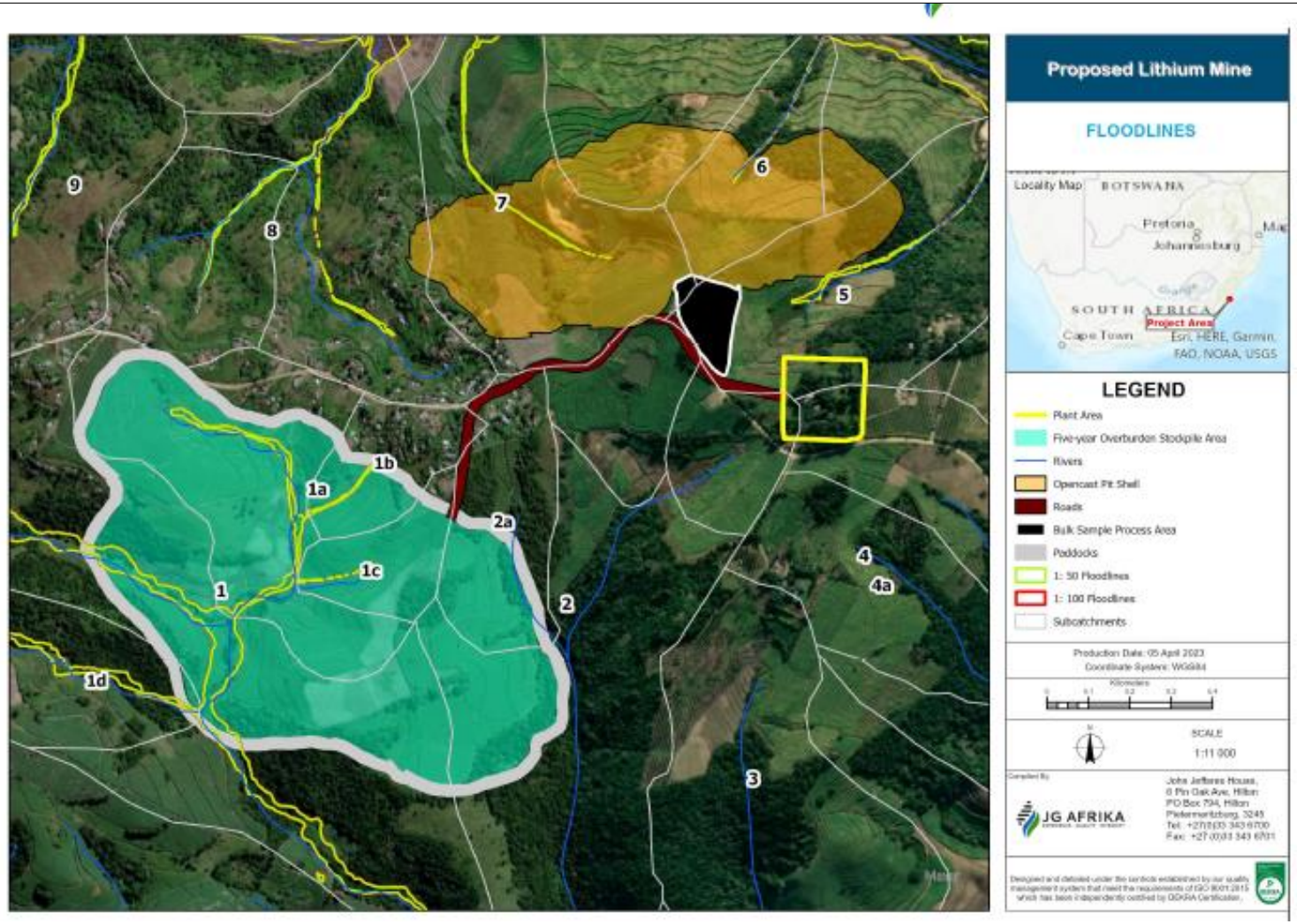

Figure 25:The 1:50-year and 1:100-year flood lines associated with drainage lines and rivers around the proposed SA Lithium Mine

8.1.6.4. National Freshwater Ecosystem Priority Areas (NFEPA)

The broader catchment has not been prioritised nationally as a Freshwater Ecosystem Priority Area (CSIR, 2011). The Mzumbe River itself is recognised nationally as a Freshwater Ecosystem Priority Area and it should be managed in such a way as to protect the current state and functioning. Wetlands identified within the project area are not considered important FEPA wetland sites. The NFEPA wetland vegetation group for wetlands occurring in the region includes the Indian Ocean Coastal Belt Group 2 (Critically Endangered, CR) and Indian Ocean Coastal Belt Group 3 (Endangered, EN) types. The ecosystem threat status of these vegetation groups suggests that wetlands occurring within this vegetation group have already been subjected to high levels of wetland transformation and degradation with little protection.

8.1.6.5. Wetlands and Seeps

The wetland specialist assessment identified 3 artificial wetlands on site as well as a seep wetland that has been fully destroyed by plantation of macadamia nuts trees (see figure 23). The artificial wetlands were found to be moderately to largely modified whereas the Seep wetland has been Seriously Modified and of Low Ecological Importance and Sensitivity. Impacts and potential ecological risks to the wetland and riparian areas associated with the mining were identified, described and assessed in terms of the level of significance of impacts/risks to aquatic resources, and were found to be moderate-high in terms of impact significance levels, in the absence of mitigation/corrective action. In order to address impacts associated with the operation of the mine, practical on-site mitigation and corrective actions were recommended and should be used in the Environmental Management Programme (EMPr) for the mine operation.

The most important potential impacts that the proposed development could exert on the wetland relate to the (indirect) impact of sedimentation as well as water quality issues.

Present Ecological Status (PES) of the wetlands

The wetlands were assessed in terms of their health and they were all found to have undergone severe modifications (Table 11). The scores indicate that the wetlands have limited functioning ecosystem processes.

Table 12: PES score for assessed wetlands

Wetland names as perf figure 11	Hydrology	Geomorphology	Vegetation	PES score
Artificial Wetland 1	7.5	7.0	8	E (7.5) Seriously modified
Artificial Wetland 2	7.0	7.0	7.5	E (7.2) Seriously modified
Artificial Wetland 3	7.0	3.2	6.0	D (5.4) Largely modified
Seep wetland 4	8.5	9.0	10.0	F (9.2) Critically modified

A wetland Impact Assessment is attached as **Appendix 6**

8.1.6.6. Estuaries

The information on this section was sourced from Aquatic Biodiversity Specialist Assessment report dated 16 March 2023. A full Specialist report has been appended as **Appendix 7.**

The mining right area is situated within Estuaries, namely; Mzumbe and Intshambili Estuaries. In 1984, Mzumbe Estuary was classified as a “river mouth”, whereas Intshambili Estuary was classified as a “lagoon” (Begg, 1984). More recently, both of these estuaries were classified as Subtropical, Large, Temporarily Closed Estuaries (van Niekerk et al. 2019)

According to Aquatic Biodiversity Specialist Assessment Report, the Project will have no direct influence on estuarine ecosystems but could have measurable indirect impacts on Mzumbe and Intshambili Estuaries.

Mzumbe Estuary

The Mzumbe Estuary receives runoff from Quaternary Catchments U80B and U80C. The area extent of about 15 hectares in the Mzumbe Estuary is between the estuary mouth and the extent of tidal influence as seen in the **Figure 26** below.

Mzumbe Estuary is underlain by Mzumbe Granitoid, an igneous rock that is classified as a granodiorite. Mzumbe Granitoid comprises mostly quartz, feldspar, and mica, and these give it a coarse-grained texture. These rocks were formed during the Proterozoic era, between 2.5 and 1.0 billion years ago. Mzumbe Estuary is unusually wide for the type of geology, and the reason for this is attributed to a natural constriction caused by 40 m-high dune that creates a barrier between the estuary floodplain and the sea (Cooper 1991).

Land use in Mzumbe River Catchment comprised mainly forestry (upper reaches), rural settlements, subsistence farming and associated livestock on communal tenure and made up of former homeland areas. The catchment is largely unregulated, except for small earth dams in the tributaries. (Aquatic Biodiversity Specialist Assessment Report dated, 16 March 2023)

Figure 26:Mzumbe Estuary

Intshambili Estuary

The area extent of about 9 hectares in the Mzumbe Estuary is between the estuary mouth and the extent of tidal influence as seen in the figure 26 below. Intshambili Estuary receives runoff from a portion of Quaternary Catchment U80A. The estuary is fed by two rivers: one to the north, on which the Project is located, and one to the south that enters the estuary near the mouth.

Intshambili Estuary is underlain by Margate Granite, an igneous rock that is classified as a biotite granite. Margate Granite comprises mostly quartz, feldspar and biotite mica, with minor amounts of other minerals such as hornblende, apatite, and zircon. These granites were formed during the Carboniferous period, around 300 million years ago. Inflows into the estuary comprise shallow, sandy channels with clean sandy bedforms (Cooper 1991).

Land use in Intshambili River Catchment comprised a mixture of rural settlements, subsistence farming and associated livestock on communal tenure and made up of former homeland areas, plus privately owned sugarcane cultivation and associated instream dams. (Aquatic Biodiversity Specialist Assessment Report dated, 16 March 2023)

Figure 27:Intshambili Estuary

The aquatic and estuary Impact Assessment is attached as Appendix

8.1.7. Ground water

The ground water information on this section was obtained from Geohydrological Investigation dated December 2022. A full Hydrogeological Specialist report has been appended as **Appendix 8.**

The study area falls within water management area number 4 – Pongola- Mtamvuna (WMA 04), in Quaternary Catchments U80A and U80C, the main water resource around the development site is the Mzumbe River.

The hydro census was undertaken within the immediate vicinity (7 km radius) of the site, except where a river or a surface water body exists. The hydro census did not extend past surface water bodies, such features are usually hydraulically connected to an aquifer and act as a constant-head boundary; and a groundwater pollution plume would theoretically not extend past a constant head boundary.

It was found during the hydro census survey that there were two (2) boreholes drilled within the site. One borehole (BH1) was equipped and operational, while the other (BH2) was blocked and destroyed. BH1 borehole is used for domestic and agricultural purposes in a farm.

Three (3) boreholes were found on properties neighbouring site. BH3 is located on a Jollypac firm, BH4 is located in a macadamia farm, and BH5 is in a residential area. These boreholes were equipped and in use. Borehole pump tests were not conducted to confirm the actual quantity of water that they can yield.

A groundwater monitoring network should contain monitoring positions which can assess the groundwater status at certain areas. A monitoring program will consist of taking regular measurements of the depth and quality of a water resource at specified intervals and at specific locations to determine the chemical, physical and biological nature of the water resource. Borehole monitoring map is reflected as **figure 28**.

Groundwater samples were collected to establish the background groundwater quality status quo. The groundwater samples were collected from a nearby natural spring. The sample was collected using the grab method directly into sample bottle supplied by the laboratory and refrigerated. The water samples were submitted to Muratho Laboratory services and consulting for chemical analysis. The analysis included compounds associated with standard drinking water parameters to determine the use and strategic value of the resource. The results were compared to the maximum concentrations for domestic use defined by the South African National Standards (SANS 241:2015)

Groundwater Flow Direction

The information on water flow direction was based on field assessment (geological setting of the area and associated recharge conditions) and GIS information extrapolated from a Digital Elevation Model (DEM) of the area. A Digital Elevation Model (DEM) is a specialized database that represents the relief of a surface between points of known elevation.

Under normal conditions (no groundwater abstraction), the water table emulates the surface topography. This implies that groundwater to a large degree mimics the surface water flow directions. The groundwater flow direction at the site is dominantly south and east. The likely receptors of the possible pollution will be anticipated to be at the down-gradient of the site. (Geohydrological Investigation, December 2022)

Groundwater Analysis.

The Samples will be analysed for chemical and physical constituents normally associated with Lithium mining on the monthly basis. The results of the analysis after 3 years will be the determinant factor of monitoring frequency change. See table 12 below.

Table 13:Groundwater Constituents for Routine Analysis.

Monitoring	Variable
Quarterly*	Manganese, Nickel, Arsenic, Iron. EC, pH, TDS, Total Hardness, Total Alkalinity, Calcium, Magnesium, Sodium, Ammonia, Potassium, Chloride, Sulphate, Fluoride, Nitrate, Nitrite, and Turbidity.

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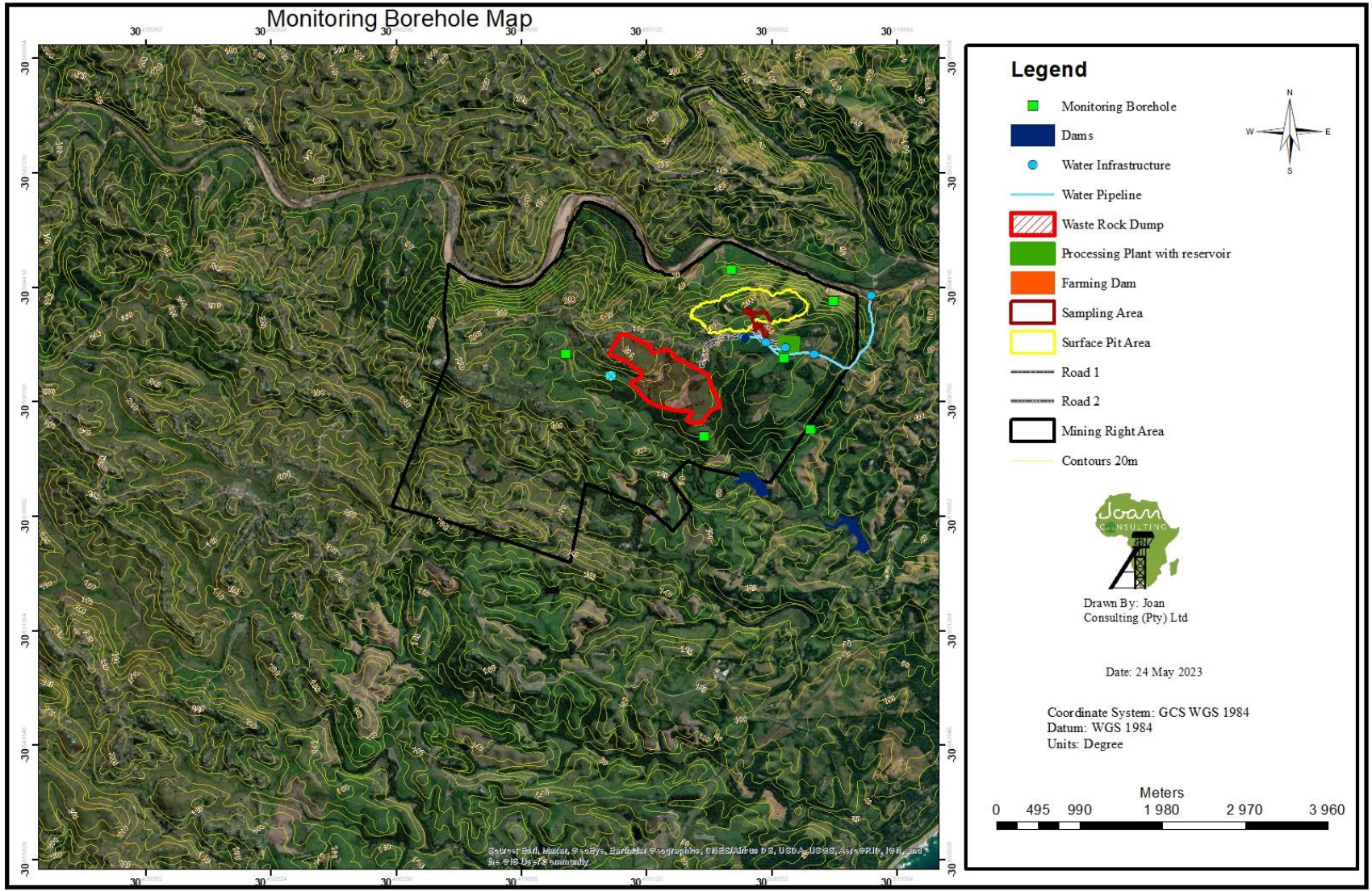


Figure 28: Borehole Monitoring Points.

8.1.8. Climate

The information on this section was sourced from Baseline Hydrology, Flood line, Stormwater Management Plan and Impact Assessment report dated April 2023. Refer to the Hydrological studies for full information (Appendix 5)

Based on the Koppen Geiger Classification, the proposed Highbury Lithium Mine falls into the CWA Climate Zone and is characterised by a warm temperate climate with dry winters and hot summers (Conradie and Kumirai, 2012).

8.1.8.1. Temperature

Temperature data for the project area was obtained from the South African Weather Service (SAWS) station 0182877 S. This station is located approximately 1.5 km south of the proposed Highbury Lithium Mine. The climate station was selected based on the length of reliable temperature data and proximity to the site. The average monthly maximum and minimum temperatures for the project area were calculated using weather data spanning the period 1950 to 1999 and are presented in Table 13 below.

Table 14:Monthly Average Maximum and Minimum Temperatures Recorded for Years 1950 – 1999 at Station 0182877 S

Statistic	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum Temperature (ºC)	19.9	19.9	19.1	16.6	14.9	12.4	12.2	13.3	14.6	15.9	17.5	18.8
Average Temperature (ºC)	23.2	23.4	22.8	21.0	19.4	17.4	17.2	17.6	18.5	19.3	20.8	22.2
Maximum Temperature (ºC)	26.5	26.9	26.5	25.4	24.0	22.3	22.1	22.0	22.3	22.7	24.1	25.6

8.1.8.2. Rainfall

The dataset representing the monthly rainfall over quaternary catchment U80A area relevant to this study were obtained from the WR2012 study. The Mean Monthly Precipitation (MMP)

and Mean Annual Precipitation (MAP) for quaternary catchment U80A is presented in Table below.

Table 15:Quaternary Catchment Precipitation in mm (WR2012)

QUAT	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	MAP
U80A	110	122	121	124	124	134	67	52	35	31	42	74	1037

Rainfall data for the project area was obtained from the SAWS rainfall station 0183005 W. This rainfall station is located approximately 3.7 km south of the project site and was selected based on the record period, the reliability of the historical rainfall data and distance to the mine. Characteristics of this rainfall station are presented in Table 14. The mean monthly rainfall depths over the period 1950 to 1999 is presented in Table 15. From Table 16, it is evident that most of the rainfall falls in the early to mid-summer.

Table 16:Rainfall Station Details

Station Number	MAP (mm)	Years Assessed	Reliability (%)	Longitude (DD)	Latitude (DD)
0183005 W	1004	1950-1999	77	- 30.5833	30.5167

Table 17:Average Rainfall Depths Recorded for Years 1950 – 1999 at Rainfall Station 0183005 W

Station Number	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	MAP
0183005 W	124	97	190	177	132	162	117	182	280	108	141	115	1004

The Quaternary Catchment Rainfall Zones, as identified in the Water Resources of South Africa 1990 (WR90) study, (still used in the WR2012 study) is provided in Table 17.

Table 18:Quaternary Catchment Rainfall Zones (WR90)

Quaternary Catchment	Rainfall Zone
U80A	U8A

There is a high degree of inter annual variation in the data obtained from Rainfall Station 0183005 W. The lowest recorded annual rainfall volume over the assessed period is 1 242 mm recorded in the year 1956. Table 17, which presents the 10 wettest years over the 1950 to 1999 period, indicates that the wettest recorded year over this period was 1 623 mm in 1975.

Table 19:Ten Wettest Years on Record for the Period 1950 - 1999

Rank	Year	MAP
1	1975	1623
2	1983	1409
3	1986	1372
4	1960	1302
5	1955	1298
6	1962	1286
7	1996	1264
8	1954	1258
9	1977	1255
10	1956	1242

8.1.8.3. Evaporation

Evaporation is known to not vary significantly from one year to the next (i.e., evaporation in one October-month, for example, is similar to evaporation in the next October-month). Therefore, it is generally considered to be acceptable to model evaporation data simply by applying 12 average monthly evaporation values over the standard hydrological year (October to September) for an area of interest. A summary of the Mean Monthly Evaporation (MME) and Mean Annual Evaporation (MAE) values (in millimetres) for the quaternary catchment U80A is provided in Table 18. The Quaternary Catchment Evaporation Zones identified in the WR90 study are provided in Table 19.

Table 20:Quaternary Catchment Evaporation (WR2012)

QUAT	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	MAE
Mean Evaporation Rate (mm)	112	115	126	125	112	111	90	76	67	71	86	101	1200
Lake Evaporation Factor	0.84	0.88	0.88	0.87	0.85	0.83	0.81	0.81	0.81	0.81	0.82	0.83	
Evapotranspiration Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.80	0.80	1.00	1.00	

Table 21:Quaternary Catchment Evaporation Zones

Quaternary Catchment	Evaporation Zone
U80A	30A

8.1.9. Heritage

Heritage resources information on this section was sourced from Phase 1 Archaeological and Heritage Impact Assessment Report. A full Archaeology and Heritage specialist report has been appended as **Appendix 9.**

8.1.9.1. Archaeology Aspect

The study identified isolated potsherds within cane plantations especially within the proposed pit site. These were found on eroded sections of the proposed pit site. The potsherds are undecorated and have been destroyed by continues farming and stamping by haulage and farming equipment. As such the potsherds could not be conclusively diagnosed. However, the presence of the identified potsherds is an indication that the site was occupied by probably Late Iron Age and historical communities prior to the establishment of cane fields.

It is evident that significant archaeological remains might have been destroyed during clearance and preparation of the cane fields and associated infrastructure, thus rendering the current finds as of low significance. In terms of archaeological significance, the potsherds were rated low significance because of lack of their original context and provenance. Based on the

field study results and field observations, the receiving environment for the Mining Right Application site is low to medium potential to yield previously unidentified archaeological sites. Literature review also revealed that no Stone Age and LIA sites are not shown on a map contained in a historical atlas of this area. This, however, should rather be seen as a lack of research in the area and not as an indication that such features do not occur.

8.1.9.2. Burial grounds and Graves

Human remains and burials are commonly found close to archaeological sites and abandoned settlements; they may be found in abandoned and neglected burial sites or occur sporadically anywhere because of prehistoric activity, victims of conflict or crime. It is often difficult to detect the presence of archaeological human burials on the landscape as these burials, in most cases, are not marked at the surface and concealed by dense vegetation cover.

Human remains are usually identified when they are exposed through erosion, earth moving activities and construction. In some instances, packed stones or bricks may indicate the presence of informal burials. If any human remains are found during the course of construction work, then they should be reported to an archaeologist and work in the immediate vicinity should cease until the appropriate actions have been carried out by the archaeologist. Where human remains are part of a burial, they would need to be exhumed under a permit from either SAHRA (for pre-colonial burials as well as burials later than about AD 1500) or Department of Health for graves younger than 60 years.

The field survey observed that local people bury their deceased relatives within homesteads. In essence every homestead has at least one grave or more. At the time of the survey, permission to access burial sites located within homesteads was not yet granted. However, the study team sampled a few homesteads and confirmed that graves occur within homesteads. The field survey identified 7 burial sites located within homesteads. (See Plate 23 to 30 on the attached 1 Archaeological and Heritage Impact Assessment appended as appendix E3).

The study concluded that graves mainly occur in built up residential area. In addition, some unmarked graves occur within cane fields, these are for people who were removed to make way for the cane fields during the colonial and apartheid eras. Two families came forward and they showed the study team some of their family graves which were partially disturbed by cane production and no longer visible. However, the affected families know the location of their family

graves although they are concealed by vegetation and sugar cane (See Plate 29&30). Given the sensitivity of graves located within homesteads, we recommend that a walk down survey be conducted as soon as permission is granted to ensure every grave is counted and documented before mining commences. This means that a professional archaeologist must be retained to document and map all the graves that occur within homesteads. This can be done with the help of informants from the local community.

It should be noted that burial grounds and gravesites are accorded the highest social significance threshold. They have both historical and social significance and are considered sacred. Wherever they exist or not, they may not be tempered with or interfered with without a permit from SAHRA. The possibility of encountering human remains during subsurface earth moving works anywhere on the landscape is ever present. The possibility of encountering previously unidentified burial sites is low within the cleared and ploughed site, however, should such sites be identified during construction and mining, they are still protected by applicable legislations, and they should be protected. A map that shows Identified heritage sites within the Mining Right Application is attached on the overleaf page as **figure 29.**

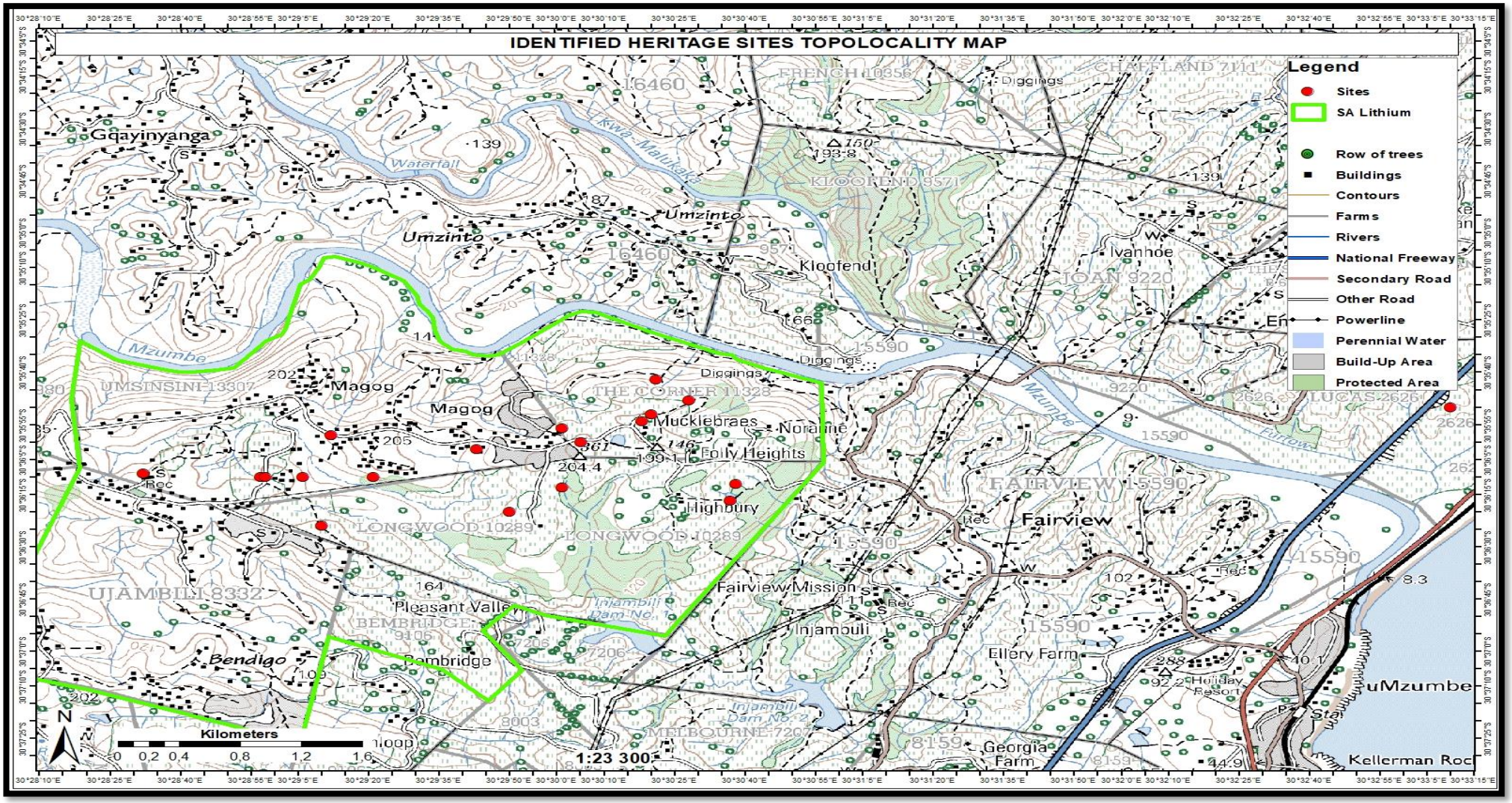


Figure 29:Identified heritage sites within the Mining Right Application site

8.1.9.3. Buildings and Structures

Heritage sites are buildings that have historic, social and aesthetic value. Such buildings can trigger our memories and emotions, to shape a feeling that we can call cultural importance. Once a heritage building is destroyed, the importance of the place and events connected to it are lost in people's memory (Marquis-Kyle and Walker, 1992). In South Africa, buildings and structures that are older than 60 years are broadly protected in terms of Section 34 of the National Heritage Resources Act (Act 25 of 199) and Section 37. (1)(a) of the Amafa KwaZulu Natal and Research Institute Act No. 05 of 2018). The Act stipulates that, no structure which is, or which may reasonably be expected to be, older than 60 years, may be demolished, altered, or added to without the prior written approval of the Institute having been obtained on written application to the Institute.

The heritage study recorded several buildings and structures that are likely to be older than 60 years. The Entabeni Supermarket building is located within the proposed pit site. The building is likely to be older than 60 years and thus protected in terms of the said Act. The structure is a typical shop structure with the shop building and a large veranda supported by steel pillars and workers dwellings at the back of the shop. In terms of Section 34 of the NHRA the Mining Right Application may be approved without any further investigation and mitigation.

8.1.9.4. Public Monuments and Memorials

There is no record of public memorials and monuments within the Mining Right Application site that require protection during mining.

8.1.10. Air quality

The information in this section was obtained from the Air Quality Impact Assessment Report **(Appendix 910.**

Ray Nkonyeni Municipality has a high number of industrial and manufacturing activities which produce toxic emissions in comparison to the other municipalities in the district. This is mainly due to the fact that there are relatively more industrial activities in Municipality, with the location of two major industrial basins in Uvongo and Marburg and limited activity in the areas of Hibberdene and Margate. (Source: Ugu DM Air Quality Management Plan, 2012).

According to the UGU District Air Quality Management Plan (2012), the following activities are indicated as the main sources of air pollution in Ugu District Municipality, namely: -

- Industrial and mining activities;
- Motor vehicle traffic on main roads and in popular coastal towns;
- Residential areas where wood is used for cooking and heating; and
- Sugar cane burning and other agricultural burning.

The area is dominated by winds from the north, northeast and east. Long-term air quality impacts are therefore expected to be the most significant to the south and south-west of the project area. Ambient air pollutant levels in the project area may be affected by the following potential sources of emission:

- Highbury Opencast Pit, sitting at an elevation of 171m and covering an area of 126 ha;
- Waste Stockpile Area, sitting at an elevation of 169 m and covering an area of about 68 ha;
- Plant laydown area, at an elevation of 173 m and covering an area of 16 ha;
- Mining to the southwest and north-west;
- Vehicles tail-pipe emissions; and
- Any other open areas exposed to the wind, including mine roads covering an area of about 9.5 ha.

8.1.10.1. Air Quality Sensitive Receptors

Air quality sensitive receptors (AQSRs) include, but are not limited to, hospitals, schools, day-care facilities, elderly housing and convalescent facilities. These are areas where the occupants are more susceptible to the adverse effects of exposure to ambient pollutants. Ambient air quality guidelines and standards, have been developed to protect human health. Ambient air quality, in contrast to occupation exposure, pertains to areas outside of an industrial site/mine boundary where the public has access to and according to the Air Quality Act, excludes air regulated by the Occupational Health and Safety Act (Act No 85 of 1993). See **Figure 30** for the location of the AQSRs. The AQSRs listed on the table 21 below were included in the dispersion model setup during the impact assessment phase, as discrete receptors.

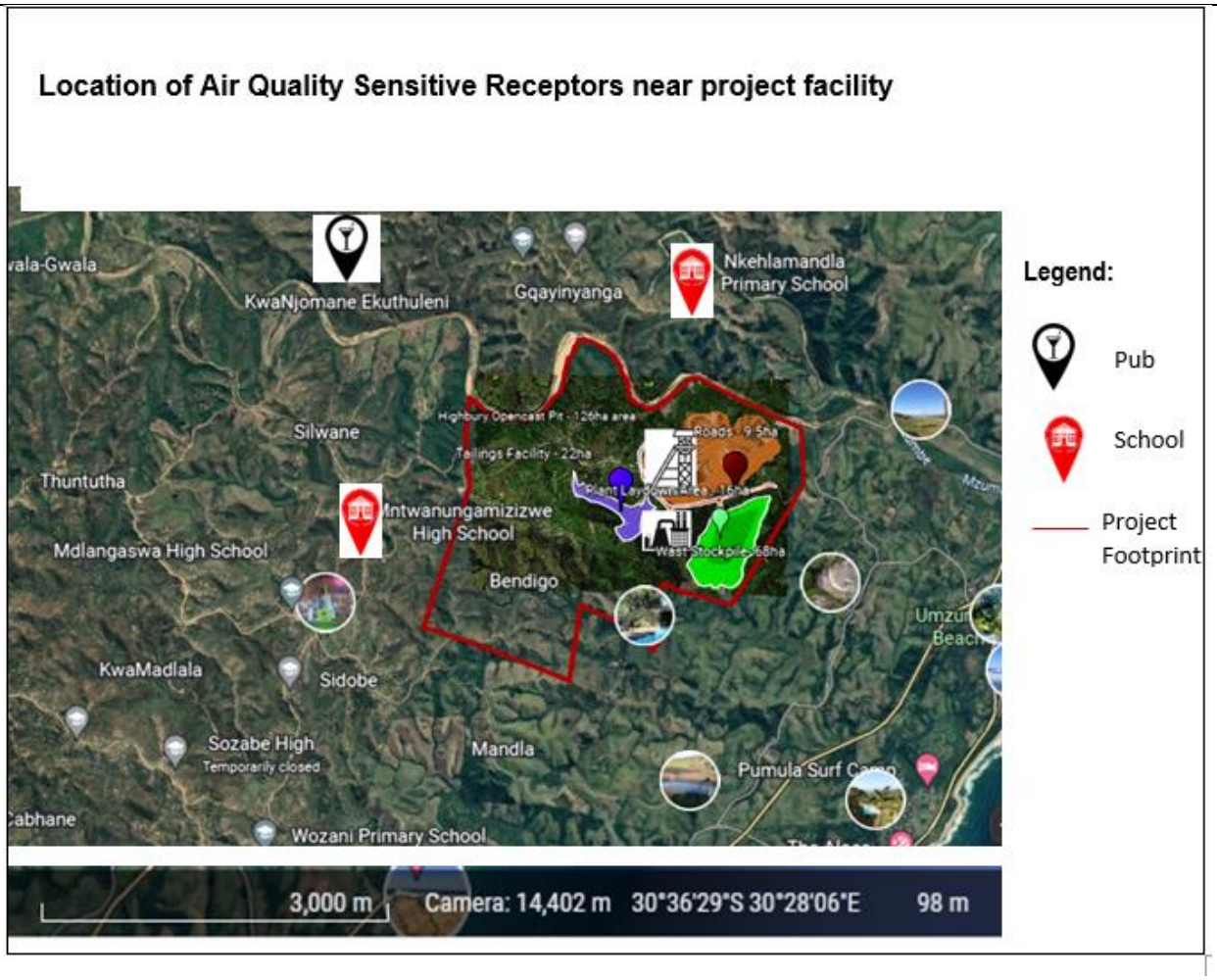


Figure 30:AQSRs surrounding the mine area.

Table 22:Potential Air quality sensitive receptors

ID/Name	Type	Latitude	Longitude
Mntwanungamizizwe High School	School	**30^0 36' 09.10" S**	**30^0 28' 16.63" E**
Nkehlamandla Primary School	School	**30^0 34' 50.05" S**	**30^0 30' 05.43" E**
Malukhakha Primary School	School	**30^0 34' 37.35" S**	**30^0 28' 45.49" E**
1	Children's Holiday Home	**30^0 33' 55" S**	**30^0 33' 32" E**
KwaNjomane Ekuthuleni	Pub	**30^0 34' 52" S**	**30^0 27' 32" E**
Mdlangaswa High School	School	**30^0 36' 51" S**	**30^0 26' 51" E**

8.1.10.2. Measured Ambient Air Quality

The proposed mine will be in an area currently affected by minimal air pollution sources such as wind-erosion from exposed areas and vehicle exhaust emissions. Pollutants released include but are not limited to, fugitive PM2.5, PM10 and TSP and gaseous pollutants as products of the combustion of petrol and diesel. There are also various mining and prospecting operations in the region.

8.1.10.3. Local Wind Field

The wind roses comprise 16 spokes, which represent the directions from which winds blew during a specific period. The colours used in the wind roses below (Figure 30), reflect the different categories of wind speeds; the yellow area, for example, representing winds in between 4 and 5 m/s. The dotted circles provide information regarding the frequency of occurrence of wind speed and direction categories. The frequency with which calms occurred, i.e. periods during which the wind speed was below 1 m/s are also indicated.

The wind field is dominated by winds from the north-easterly sector. The strongest winds (>6 m/s) occurred mostly from the northerly sectors. Calm conditions occurred 3.66% of the time, with the average wind speed over the period of 4.36 m/s. Wind speeds are stronger during the day but with a higher frequency of calm conditions (4.01% during the day) than during the night (3.31% during the night). Night-time shows dominant north-easterly, east-north-easterly, south-south-easterly and southerly components to the wind field and during the day these winds decrease, and the northerly winds dominate.

Strong winds exceeding 6 m/s occurred most frequently during summer and spring, followed by winter. Calm conditions occurred most frequently during the autumn and winter months. Seasonally, the wind flow pattern conforms to the period average wind flow pattern. The seasonal wind field shows considerable seasonal differences in the wind fields. During summer, autumn and winter the dominant winds are from the east, northeast and south, while in spring, the southerly winds dominate. See **Figure 31** for the day and night time wind roses.

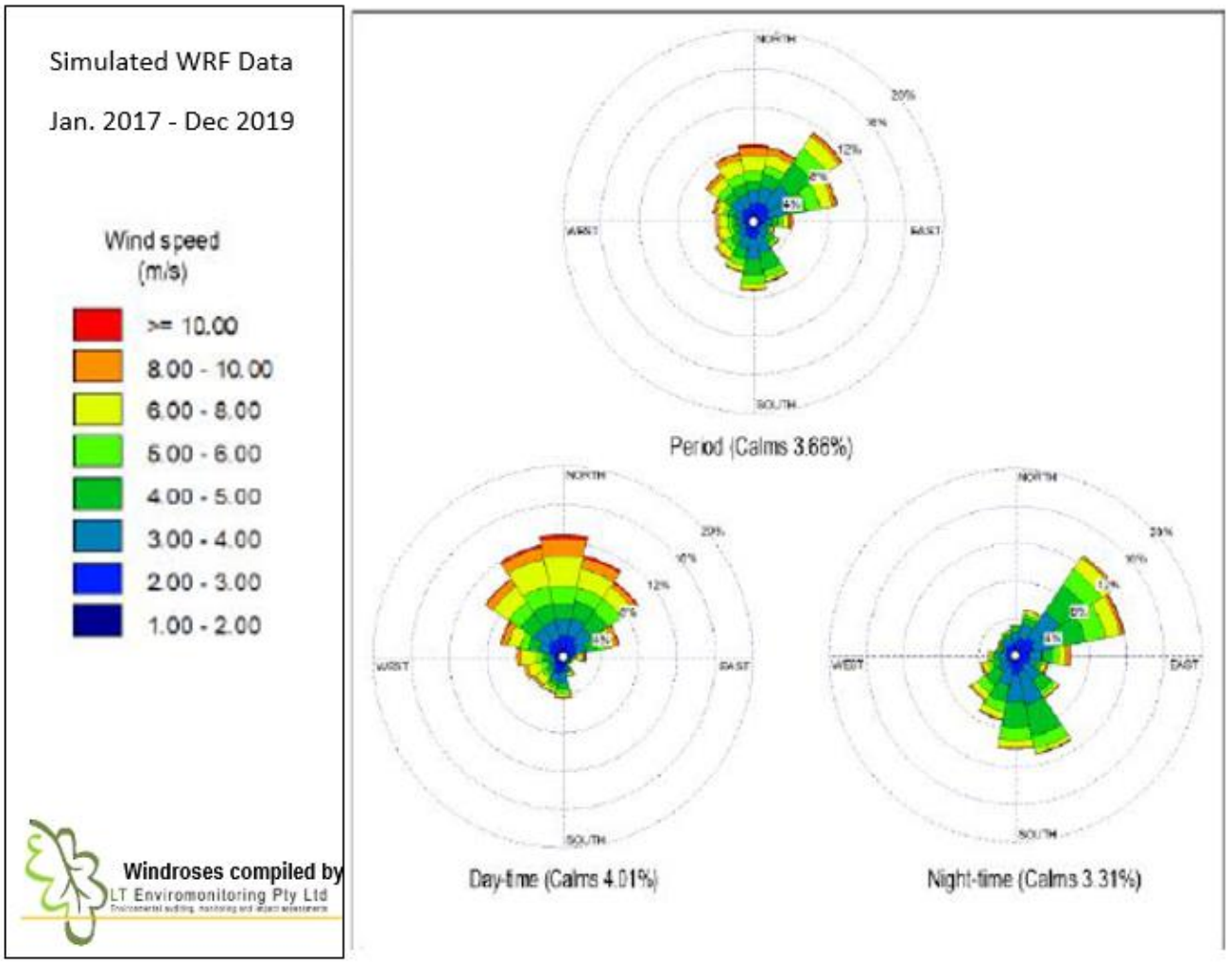


Figure 31:Period, day- and night-time wind roses

(AERMET processed WRF data, January 2017 to December 2019)

8.1.11. Climate Change

The Ugu District is already familiar with climate related extremes in the form of droughts and flooding, posing a significant risk to the region's economy, ecosystems, and population. However, the impact of a changing climate will stretch beyond the impact of extreme events. Considering the socioeconomic and environmental challenges currently faced by the Ugu District, increasing costs associated with the projected climate change impact will compromise growth and development goals.

Climate related extreme events and long-term impact has already and will continue to place a significant financial burden on public sector service delivery, compounded by prevailing socio-economic and environmental factors contributing to overall vulnerability. This burden will continue to increase, if climate change is not adequately addressed across district through effective response strategies.

A summary of the likely climate change impacts associated with a range of possible climate risks for the Ugu District were assed based on the results of the climate assessment, manageability, exposure, and hazard analysis undertaken as well as in consultation with a number of key stakeholders and observations of the current socio-economic conditions. See table 22 for impacts linked to climate variability.

Table 23: Impacts Linked to Climate Variability

Climate Change Vulnerability: Change in Rainfall	
Type of Change	Increased number of wet days and/or increase in extreme precipitation events.
Impact	▪ Increased risk of floods and consequent damage to property, crops and loss of life. ▪ Water logging of soil which can affect crops. ▪ Increased risk from water borne diseases, particularly after flood events. ▪ Damage to bulk infrastructure such as irrigation systems. ▪ Damage to property and crops from winds associated with violent storms. ▪ Increase in lightning events which can damage crops and cause loss of life.
Type of Change	Increased number of consecutive dry days
Impact	▪ Decreases in runoff and streamflow and an increased risk of drought, affecting crop production, food security, and rural livelihoods. ▪ Reduced streamflow which could result in threat for communities that depend on surface water. ▪ Loss of soil moisture affecting crops and increased risk of soil erosion due to wind. ▪ Increased risk of veld-fires and resultant threat to property, grazing, and crops.
Type of Change	Variability or change in the timing of precipitation
Impact	▪ Rain-fed agriculture, which relies on the timing of rains for planting and harvest, is particularly at risk. ▪ Less predictability impacts the management of water resources in catchments and for large water infrastructure, with implications for water supply reliability.
Climate Change Vulnerability: Temperature Rise	
Type of Change	Increased number of warm and very hot days, and increased daily maximum temperatures

Impact	▪ Increased evaporation impacting on the availability of surface water. ▪ Soil degradation due to increased acidity, nutrient depletion, declining microbiological diversity, lower water retention, and increased runoff. ▪ Positive or negative impacts on crops' growing seasons, yields and growing range. Some crops – especially fruits – require a chill factor (a period of cold) in the winter to have a good harvest. ▪ Increased incidence of heat waves and associated health conditions for human and livestock health, such as heat stress. Heat especially impacts the health of the particularly old and young or those already suffering from other illness. ▪ Increase in concentration and range of pests and pathogens that are human and livestock disease vectors (carriers), such as mosquitos and ticks. ▪ Increased risk of drought conditions, and of wildfires, plus associated damage to crops, property, and infrastructure.

See **Appendix 11** for the Climate Change Impact Assessment

8.1.12. Noise

Field assessments in and around the site were undertaken on 15 and 16 November 2022, after an initial desktop study. This included the identification of the noise sensitive stakeholders, existing noise sources and other baseline noise contributors. Where required, viable alternative measurement positions near the originally identified monitoring localities were investigated to ensure measurements were not influenced by extraneous noise sources (such as close proximity to sugar cane loading, or cafeteria music playing in the township).

Sensitive receptors were identified by means of desktop assessment (up to 1km from the project footprint, some further) and by information supplied by the project team. Receptor localities dominated by Residential farmland or rural township with Educational – high school and Equitation Centre as shown in **Figure 32**.

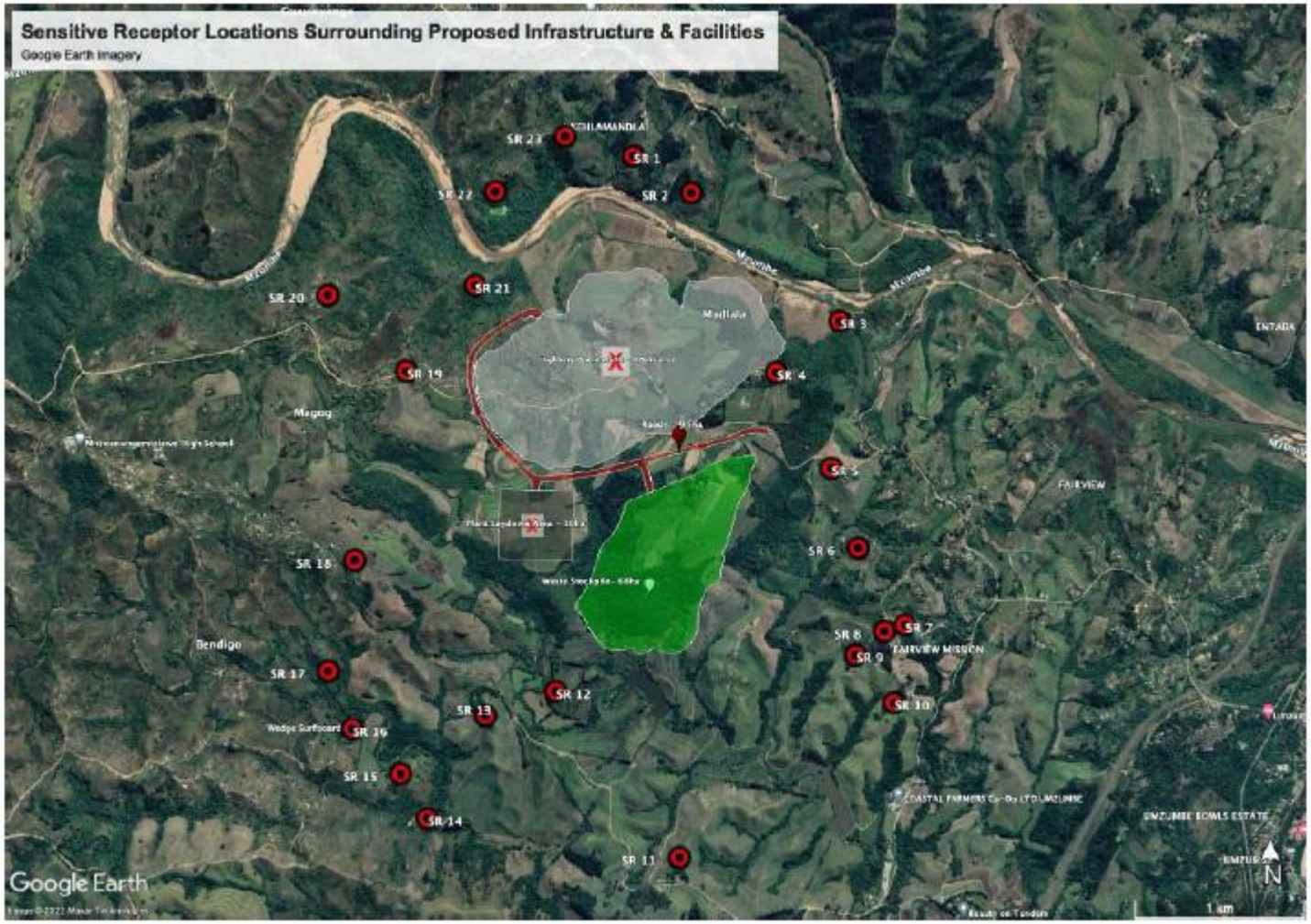


Figure 32:Identified sensitive receptor locations surrounding the site.

8.1.13. Visual

The information on this section was sourced from Visual Impact Assessment report dated March 2023. A full Specialist report has been appended as **Appendix 3.**

The Natural Landscape

The natural landscape of the study area is characterised by a rolling topography which is created by the mountains, rivers, such as the Mzumbe and Kwamulakaka Rivers, and the ocean to the east of the study site. The vegetation cover is dense on the lower lying areas and along the rivers, the vegetation higher up on the mountains are mostly grass with clumps of trees scattered throughout the area. According to Mucina and Rutherford (2009) the vegetation of the study area is a combination of the KwaZulu Natal Coastal Belt Grassland and the KwaZulu Natal Coastal Belt Thornveld. Some of the natural vegetation, specifically the southern and the north-eastern section of the study area, has been removed and replaced by sugarcane fields. The land use range from residential, mining/industrial, agriculture and recreational. See table 23 below.

Table 24:Land Use within the Study Area

Land Use	Description
Residential	• The residential component of the study area is mostly rural residential with villages such as Magog, Fairview, Silwane, Bendigo, Velumemeze and Gwala-Gwala. • The small towns (holiday destinations) are located along the east coast and the residential component varies from vacation homes that are empty for a period of the year to permanent residential units. Some of the towns within the study area include Hibberdene, Umzumbe Beach, Pumula, Sunview Port and South Port. • There are a few farms scattered in the southern and the north-eastern section of the study area. These are mostly associated with the sugarcane fields.
Industrial/ Mining	There is small scale mining project within the study area.

Land Use	Description
	There are not really any industrial activities within the study area except for the small package plant, Jolly Pack.
Institutional/Recreational	The institutional facilities are mostly primary and high schools associated with the various villages in the study area. No recreational facilities were noted during the site inspection.
Agricultural	Agricultural activities include the sugarcane fields located to the south and the north-east of the project site, and the small-scale farming such as cattle and crops associated with the villages.

The study area has been transformed by the villages, agricultural activities and the coastal towns, the mountains, rivers and the ocean still contribute to a strong sense of place and high visual resource value. A summary of the study area's visual resource values is tabulated in Table 24 below.

Table 25:Value of the Visual Resource

Value	Description	Visual Resource
High	This landscape type is considered to have a *high* value because it is a: Distinct landscape that exhibits a very positive character with valued features that combine to give the experience of unity, richness and harmony. It is a landscape that may be of particular importance to conserve and which has a strong sense of place. **<u>Sensitivity:</u>** It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt with.	Rivers such as: • Kwamalukaka River and tributaries • Mzumbe River and tributaries • Mountains Ocean
Moderate	This landscape type is considered to have a *moderate* value because it is a: Common landscape that exhibits some positive character, but which has evidence of alteration /	Agricultural fields (Sugarcane fields) Rural villages such as: • Magog • Fairview

Value	Description	Visual Resource
	degradation/ erosion of features resulting in areas of more mixed character. **Sensitivity:** It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with	• Silwane • Velumemeze • Bendigo • Mandla • Gwala-Gwala Coastal towns such as: • Hibberdene • Umzumbe Beach • Pumula • Sunview Port • South Port.
Low	• This landscape type is considered to have a *low* value because it is a: • Minimal landscape generally negative in character with few, if any, valued features. **Sensitivity:** It is not sensitive to change in general and change	Industrial/ Infrastructure • Jolly Pack • Roads

8.1.14. Major Surrounding Road Networks

The two major routes near the mine are the N2 and R102 which run parallel to each other on the coastline.

The N2 is a national route in South Africa that runs from Cape Town through George, Gqeberha, East London, Mthatha and Durban to Ermelo. It is the main highway along the Indian Ocean coast of the country. In the study area it connects Umzumbe to Port Shepstone and Durban Metropolitan. The R102 is a Regional Route in South Africa. It is the route designation for all old sections of the N2 thus it is a discontinuous road that resumes in areas where a new N2 has been constructed.

The expected traffic volumes that will be generated by the development, were assigned to the road network of the existing background traffic for the years 2023, and 2043.
See **Appendix 12** for the Traffic Impact Assessment report

8.2. Population Demography

The proposed mining right area is situated in the Ray Nkonyeni Local Municipality of Ugu District municipality in the KwaZulu Natal Province (see **Figure 33**). The local municipality is one of the four local municipalities under Ugu District Municipality. Ray Nkonyeni Municipality is ranked number five out of the forty-three local municipalities in terms of population in the province of KwaZulu Natal (KZN).

The Indian Ocean borders the Eastern side of the municipality and covers approximately 72 km of the coastal belt. The municipality consists of a diverse population.

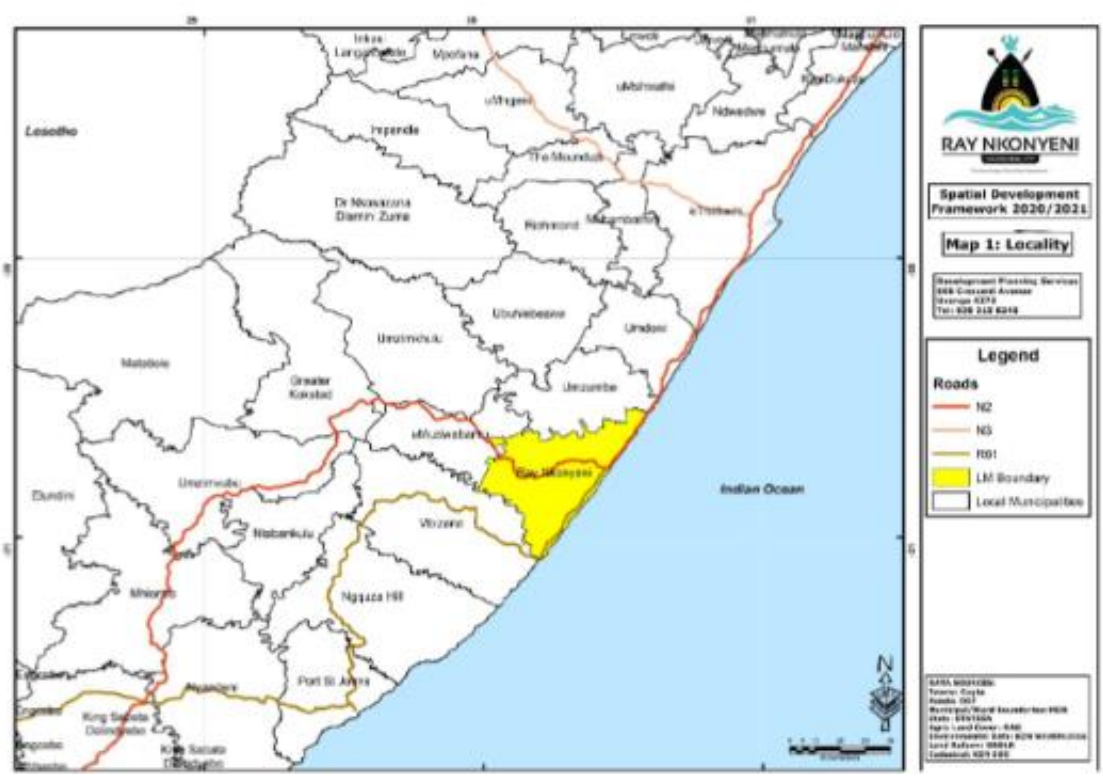
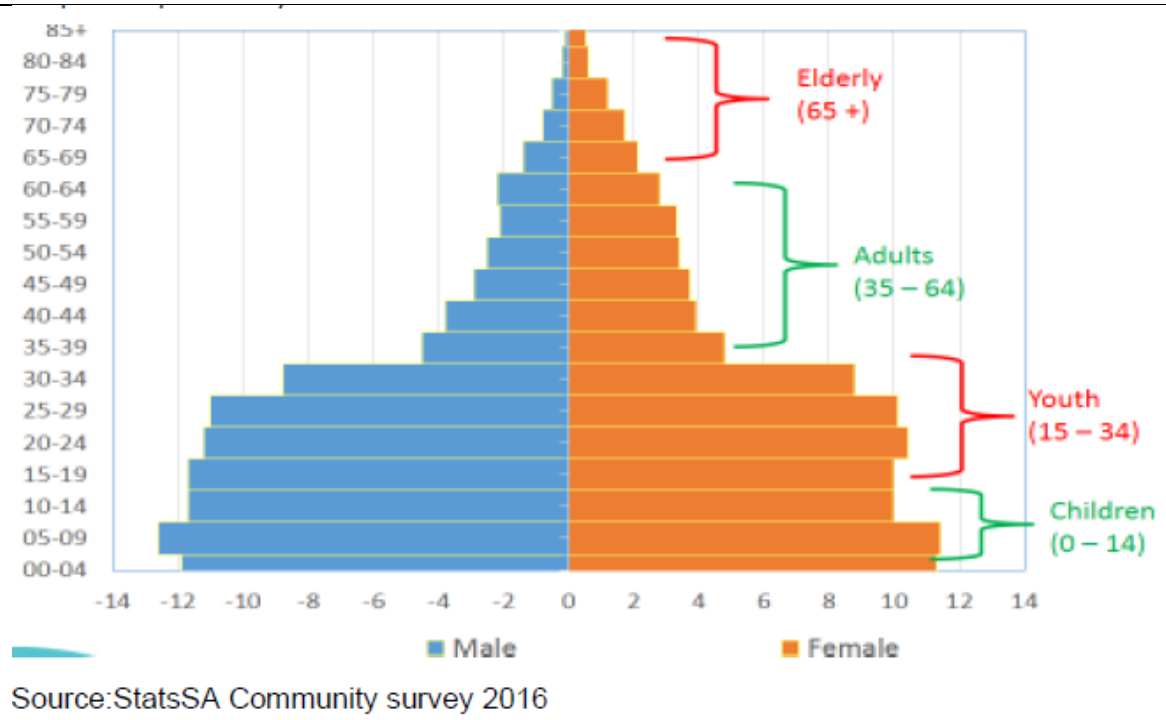


Figure 33:Ray Nkonyeni Local Municipality map

8.2.1. Population profile

Ray Nkonyeni Municipality's population is 392 40 according to the latest Stats release. With this population, RNM is the highest populated municipality in the district, making 45% of the entire district's population. The population within the municipality has been growing rapidly throughout the years due to a number of socio-economic factors. Trends for the past decade indicate that former RNM constantly experience a youth bulge. See figure 34.

The population pyramid below shows a trend of more baby boys (12%) born than baby girls. Between the ages of 0-14 years, the number of boys as compared to that of girls is high. As the male generation grows older, between the ages of 14-29 years, the number is still higher as compared to that of girls. However, there is a drop in the male generation between the ages of 30-39 years, with a significant further drop further between the ages of 40-85+.



Source:StatsSA Community survey 2016

Figure 34: Population Pyramid in the municipality

8.2.2. Population Percentage Per Age Group

Ray Nkonyeni Municipality has a high percentage in the youth age group, while the elderly age group (65 +) is the lowest. Ages between 0-14 surprisingly is the second largest percentage, but as people grow, the percentage decreases. From research, it has been ascertained that this is due to a number of social ills, resulting in high death rate. Ages between 35-64 years is 21% which may be due to outmigration in search of job opportunities or due to deaths. See figure 35.

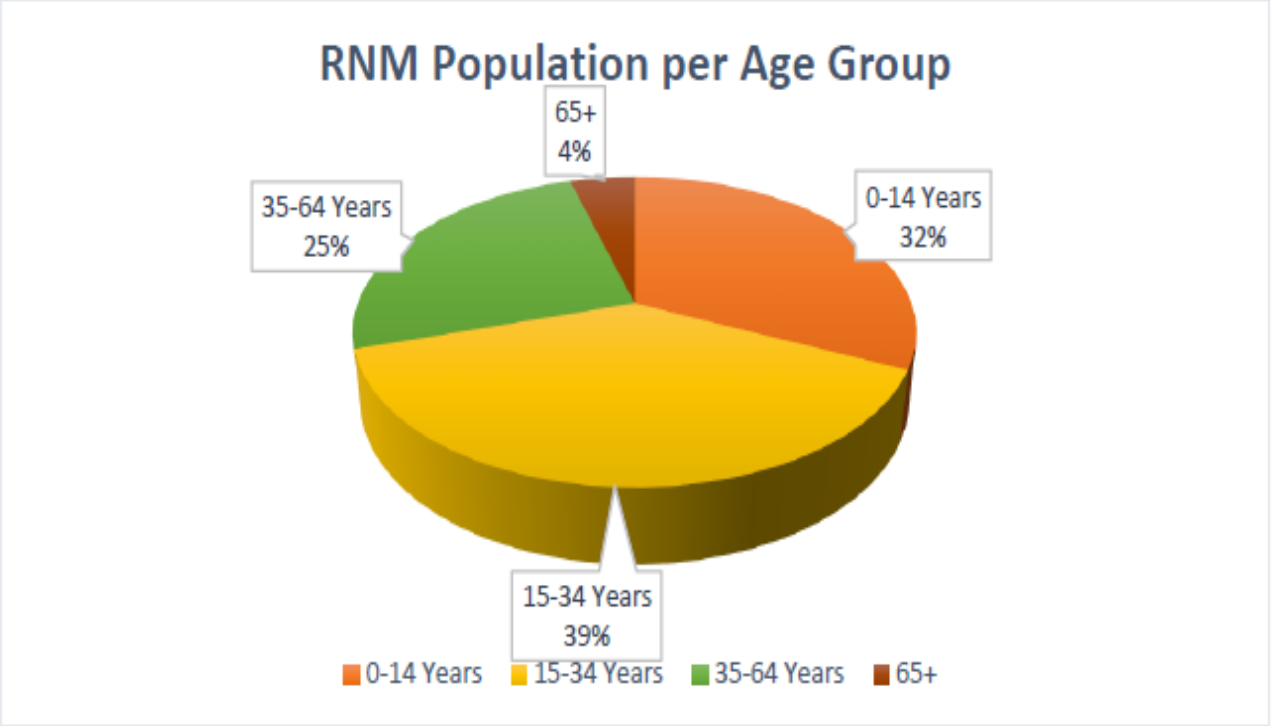


Figure 35:Population per age Group

8.2.3. Population Percentage Per Gender

Consistent with the national trend, the municipality has less males than females, see graph below. This is attributed to socio-economic factors. In as much as RNM has a thriving economy, due to the steady influx of people from other neighbouring municipalities and other areas over the years, there has been a steady rise of unemployment. This has resulted in many people migrating in search of greener pastures. Another contributing factor of why the number of males is lower is the social factor. According to the district's Department of Health, statistical information, many men succumb to diseases early in life compared to women. See **Figure 36.**

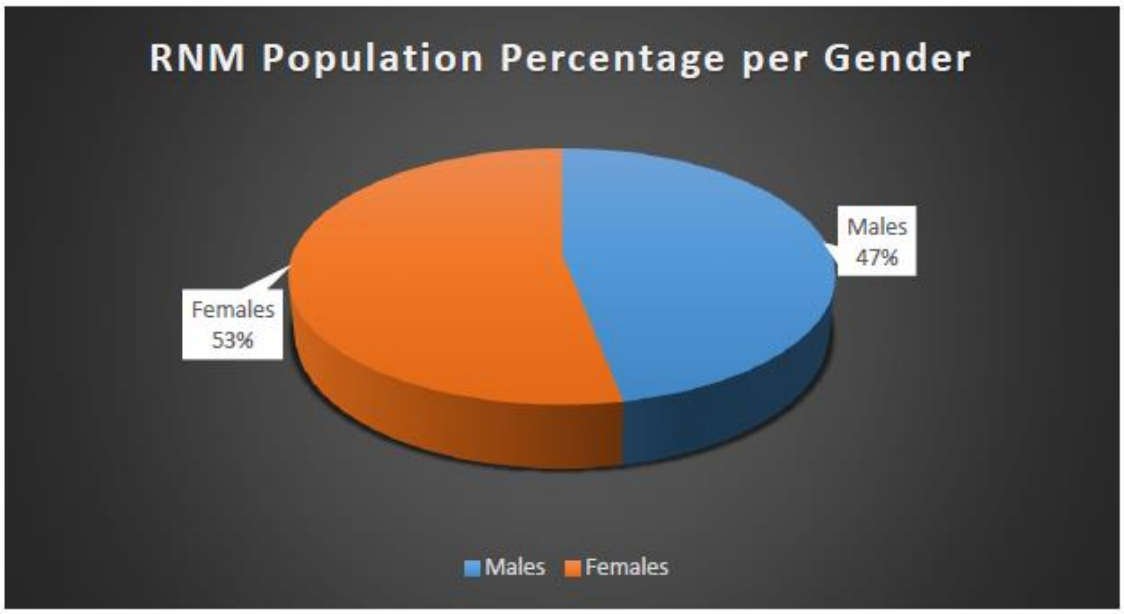


Figure 36: RNM Population per Gender

8.2.4. Population by Race

About 74.7% of the population have completed Grade 9 or higher and 45.2% Completed Matric or higher.

Ray Nkonyeni Municipality has a diverse population. There has been a constant racial pattern with Africans being dominant by a huge margin (82%) and followed by Whites (11%), followed by the Coloured population and lastly the Indian population, see graph below. The African population is distributed throughout the municipality's 36 wards, while the White, Indian and Coloured is along the coastal wards. Over the years, RNM has seen an overall increase across races, the Indian race, however saw a decline. See **Figure 37.**

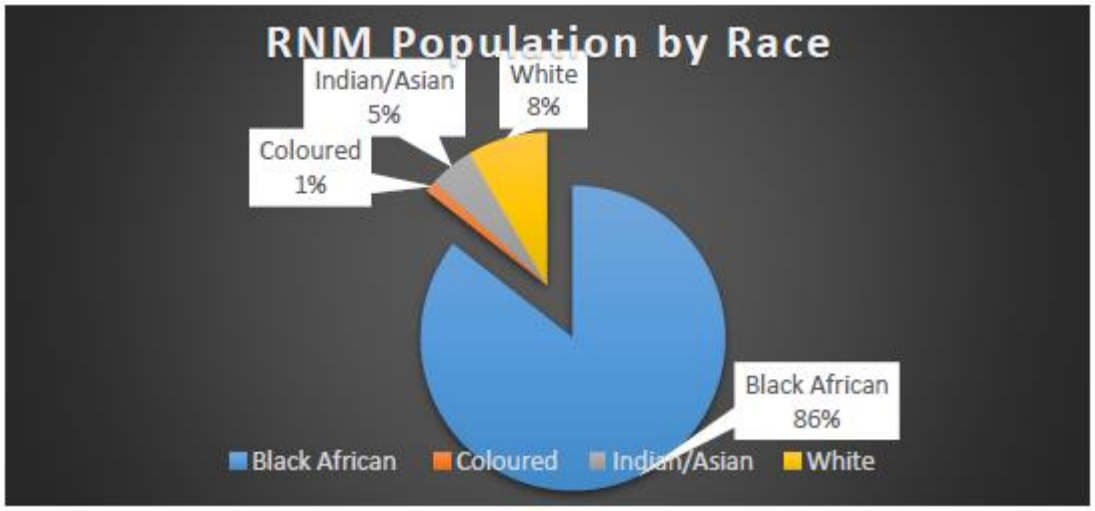


Figure 37: Population by Race

8.2.5. Population By Home Language

According to the KZN Provincial Language Policy, IsiZulu, English, Afrikaans and isiXhosa are already regarded as official languages in the province. Looking at the top five of the mostly spoken languages in the province, the findings are, in the eleven District Municipalities, isiZulu language is mostly spoken, hence in RNM isiZulu is the most spoken language (76%)

English is the second most popular spoken language, at 11.4% while IsiXhosa follows at 6.3%. Afrikaans is 3.2%. There are also other languages spoken by a very small minority. See **Figure 38.**

Figure 38: Home Language Percentage in the municipality

8.3. Socio-economic Aspect.

8.3.1. Employment in the municipality

Ray Nkonyeni local Municipality is the most developed local municipality within the Ugu District, boasting an array of social, educational, economic and health facilities. This alone serves as an attraction for job seekers as all these facilities offer more job opportunities than the surrounding local municipalities, however, contrary, there is high unemployment more especially in the formal sector About 43% of the population of the people living within the municipality are discourage to seek work and are not economically active. About 35.9% of the people are employed in the formal sector. See **Figure 39.**

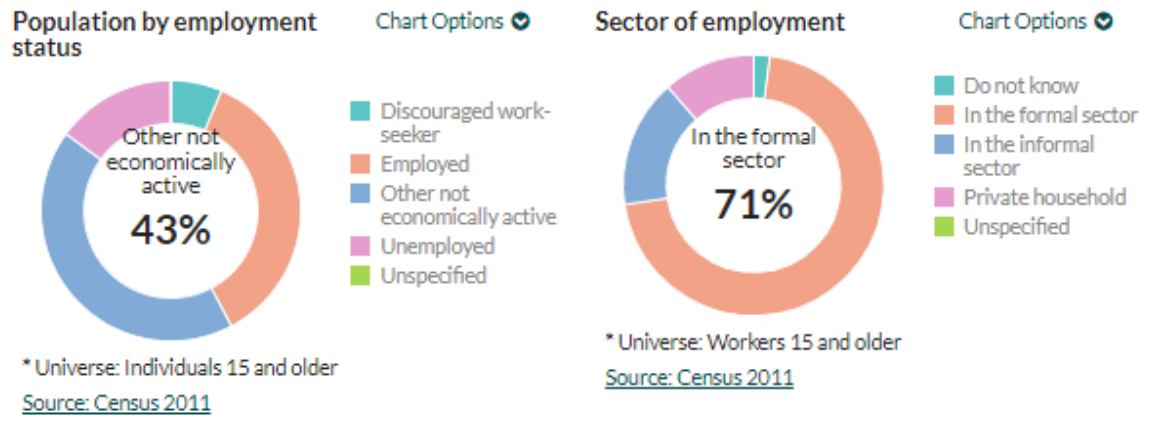


Figure 39:Employment within the municipality

8.3.2. Employment by Gender

According to Ray Nkonyeni Municipality 2022/2023 – 2026/2027 IDP, the female population of the Municipality which is not economical active is higher as compared to the male population. In terms of discouraged work seeker, the female population is also higher as compared to that of males. With unemployment, again, the female population is higher than that of males. According to the recent survey, in terms of employment, both female and male gender are now equal, however, it must be mentioned that the number is much lower as compared to those not economically active. See **Figure 40**.

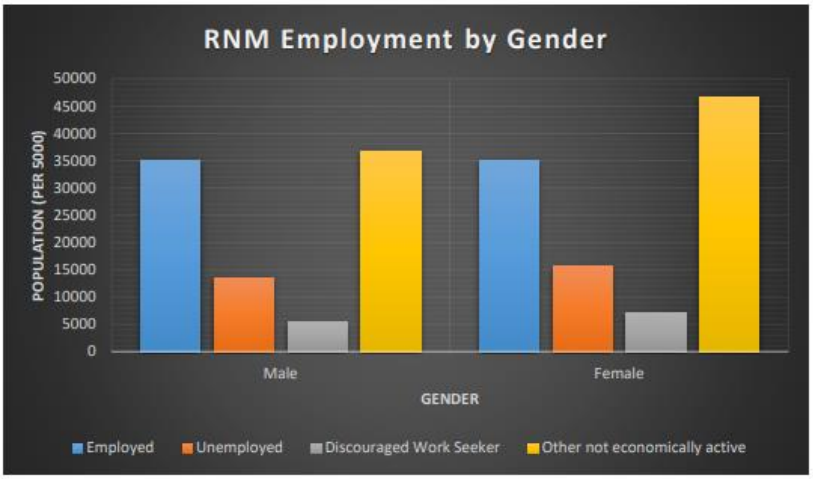


Figure 40:Ray Nkonyeni Local Municipality Employment by Gender

Appendix 13 is the Social Impact Assessment that details

9. DESCRIPTION OF THE CURRENT LAND USES.

The direct surrounds of the proposed site have been intensively used for sugarcane farming and Settlement, with sugar cane production being the most dominant land use. Macadamia nuts and Banana plantations also makes a list of common crops farmed in the region, with Farm longwood having macadamia nuts trees and banana trees plantations.

Scattered settlement starts from the east of the pit boundary towards the further east of the site. There are also home and farmsteads in the farm portions where the land owners dwell in the farms. Several dirt roads exist, increasing the slope-channel connectivity.

Two small scale mining areas, owned by Umzumbe Mining (Pty) Ltd and Dantaprox are located in the farm The Corner. There are also sand mining activities along the Umzumbe River.

Current land use map is presented on the overleaf page as **figure 41**

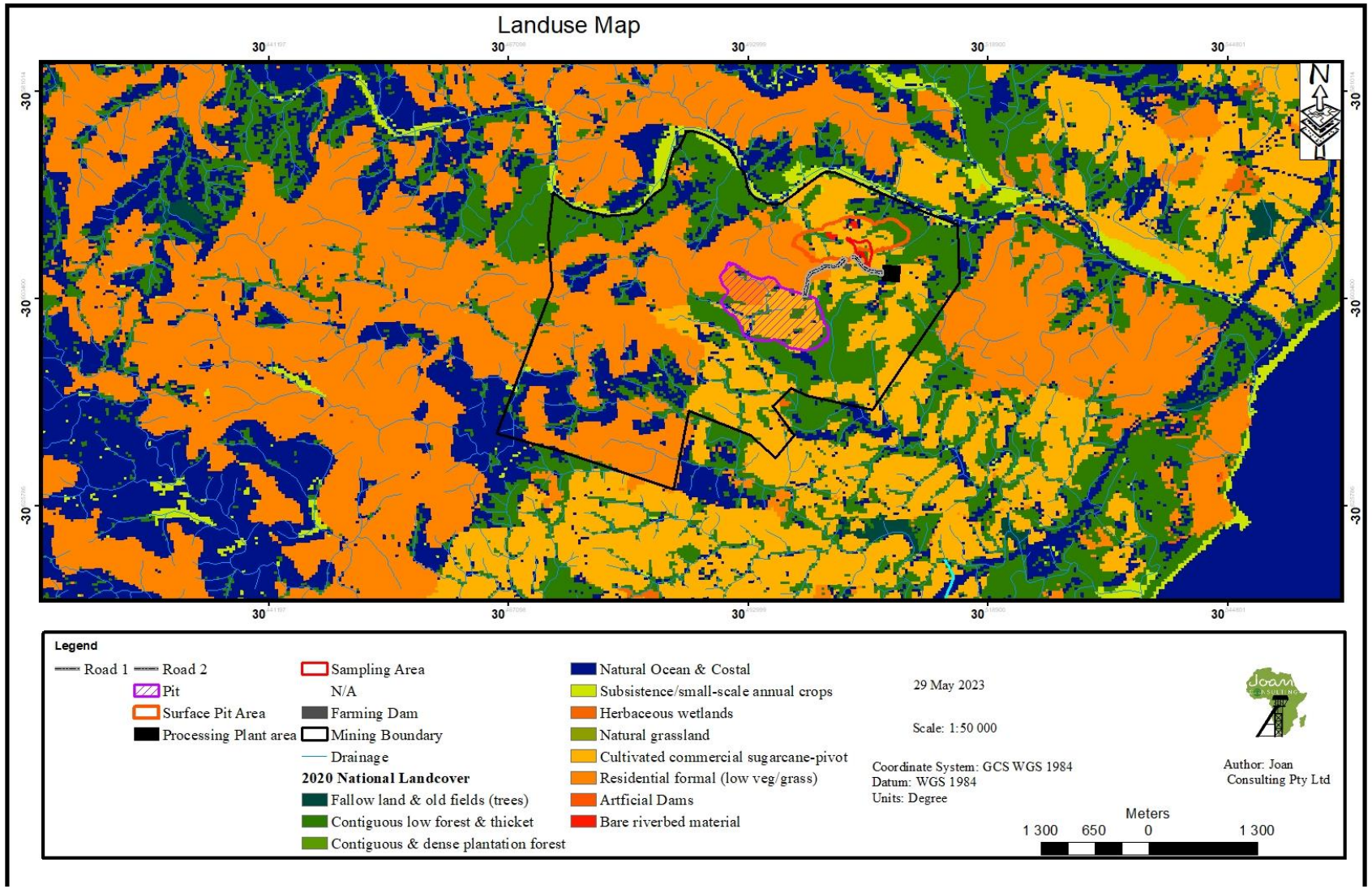


Figure 41: Project Current Land Use Map

10. DESCRIPTION OF SPECIFIC ENVIRONMENTAL FEATURES AND INFRASTRUCTURE ON THE SITE.

The following environmental features and infrastructure exist within and adjacent to the mining right area.

- The Umzumbe River (NEFPA recognised),
- Patches of Natural Forest & CBA
- Wetland & seeps
- Community settlements (and farmsteads)
- Sugar cane plantations
- Banana Plantation on farm Longwood
- Macadamia nuts on farm Logwood.
- Electricity distribution powerlines.
- Gravel roads.
- Small scale mining activities.
- Features of heritage significant (including graves)

11. IMPACTS AND RISKS IDENTIFIED INCLUDING THE NATURE, SIGNIFICANCE, CONSEQUENCE, EXTENT, DURATION AND PROBABILITY OF THE IMPACTS, INCLUDING THE DEGREE TO WHICH THESE IMPACTS

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability, and duration of the impacts. Please indicate the extent to which they can be reversed, the extent to which they may cause irreplaceable loss of resources, and can be avoided, managed or mitigated).

Below is the list of potential impacts of the mining activities followed by the table that details the nature, significance, consequence, extent, duration and probability of the impacts as well as the degree or extent to which they can be reversed, cause irreplaceable loss of resources, and or can be avoided, managed or mitigated

Potential impacts

- Impacts on fauna and flora: degradation of natural vegetation and habitat for animal life
- Impacts on surface water: -increase in turbidity of surface water runoff.
- Impacts on surface water: pollution from spillages of hydrocarbons and leachates.
- Impacts on the groundwater: - pollution from spillages of hydrocarbons and leachate from waste storage
- Impacts on drainage system and regime: - Surface water runoff/drainage impeded and diverted by the mining infrastructure
- Impact on soil: Loss of topsoil as a resource, change in capability, erosion and contamination.
- Visual impact by mining infrastructure and activities
- Air pollution by dust and other emissions.
- Impact on environmental ambiance: increase of ambient noise levels
- Impact on water courses-siltation on watercourses due to inadequate storm water management and soil stabilization
- Impacts on wetland (water) and springs.
- Socio-economic- to local communities and ultimately the national economy through job creation, procurements of goods and services.
- Establishment and spread of Alien Invasive Species due to disturbance of vegetation communities and distribution due to movement of trucks and personnel;
- Loss of or destruction of archaeological and cultural sites;
- Impacts on sensitive and listed ecosystems

12. METHODOLOGY USED IN DETERMINING AND RANKING THE NATURE, SIGNIFICANCE, CONSEQUENCES, EXTENT, DURATION AND PROBABILITY OF POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS;

(Describe how the significance, probability, and duration of the aforesaid identified impacts that were identified through the consultation process was determined in order to decide the extent to which the initial site layout needs revision).

Table 25 below provides the detailed methodology used for the assessment of the significance of potential environmental of the proposed project. This methodology allows for the identified potential impacts to be analysed in a systematic manner, with significance rating (from insignificant to very high) assigned to each potential impact. The significance of an impact is defined as a combination of the consequence of the impact occurring and the probability that the impact will occur. The criteria used to determine impact consequence include extent, intensity and duration of the impact and are presented below.

Table 26:Criteria Used for Rating of Impacts

Nature of the impact (N)		
Positive	+	Impact will be beneficial to the environment (a benefit).
Negative	-	Impact will not be beneficial to the environment (a cost).
Neutral	0	Where a negative impact is offset by a positive impact, or mitigation measures, to have no overall effect.
`Magnitude(M)		
Minor	2	Negligible effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been altered significantly, and have little to no conservation importance (negligible sensitivity*).
Low	4	Minimal effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been largely modified, and / or have a low conservation importance (low sensitivity*).
Moderate	6	Notable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have already been moderately modified, and have a medium conservation importance (medium sensitivity*).
High	8	Considerable effects on biophysical or social functions / processes. Includes areas / environmental aspects which have been

		slightly modified and have a high conservation importance (high sensitivity*).
Very high	10	Severe effects on biophysical or social functions / processes. Includes areas / environmental aspects which have not previously been impacted upon and are pristine, thus of very high conservation importance (very high sensitivity*).
Extent (E)		
Site only	1	Effect limited to the site and its immediate surroundings.
Local	2	Effect limited to within 3-5 km of the site.
Regional	3	Activity will have an impact on a regional scale.
National	4	Activity will have an impact on a national scale.
International	5	Activity will have an impact on an international scale.
Duration (D)		
Immediate	1	Effect occurs periodically throughout the life of the activity.
Short term	2	Effect lasts for a period 0 to 5 years.
Medium term	3	Effect continues for a period between 5 and 15 years.
Long term	4	Effect will cease after the operational life of the activity either because of natural process or by human intervention.
Permanent	5	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.
Probability of occurrence (P)		
Improbable	1	Less than 30% chance of occurrence.
Low	2	Between 30 and 50% chance of occurrence.
Medium	3	Between 50 and 70% chance of occurrence.
High	4	Greater than 70% chance of occurrence.
Definite	5	Will occur, or where applicable has occurred, regardless or in spite of any mitigation measures.

Once the impact criteria have been ranked for each impact, the significance of the impacts will be calculated using the following formula:

Significance Points (SP) = (Magnitude + Duration + Extent) x Probability

The significance of the ecological impact is therefore calculated by multiplying the severity rating with the probability rating. The maximum value that can be reached through this impact evaluation process is 100 SP (points). The significance for each impact is rated as High (SP≥60), Medium (SP = 31-60) and Low (SP<30) significance as shown in the Table 26 below.

Table 27:Criteria for Rating of Classified Impacts

Significance of predicted NEGATIVE impacts		
Low	0-30	Where the impact will have a relatively small effect on the environment and will require minimum or no mitigation and as such have a limited influence on the decision
Medium	31-60	Where the impact can have an influence on the environment and should be mitigated and as such could have an influence on the decision unless it is mitigated.
High	61-100	Where the impact will definitely have an influence on the environment and must be mitigated, where possible. This impact will influence the decision regardless of any possible mitigation.
Significance of predicted POSITIVE impacts		
Low	0-30	Where the impact will have a relatively small positive effect on the environment.
Medium	31-60	Where the positive impact will counteract an existing negative impact and result in an overall neutral effect on the environment.
High	61-100	Where the positive impact will improve the environment relative to baseline conditions.

13. THE POSITIVE AND NEGATIVE IMPACTS THAT THE PROPOSED ACTIVITY (IN TERMS OF THE INITIAL SITE LAYOUT) AND ALTERNATIVES WILL HAVE ON THE ENVIRONMENT AND THE COMMUNITY THAT MAY BE AFFECTED.

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties)

The positive and negative impacts of the project are discussed below.

13.1. Positive Impacts

The following are the potential positive impacts the activity will have on the environment and community in terms of the site layout.

- ***Job creation***: the local people and surrounding areas will benefit greatly from employment opportunities during the construction and operational phases of the proposed mining activities.
- ***Upliftment and strengthening of the local and national economy:*** The local economy will be up lifted because local business will get to supply goods and services to the mine and businesses such as spaza shop and supermarket will be profitable as local people will have jobs and procure goods from the local shops.
- ***Improved standard of living:*** The creation of sustainable jobs during the construction and operational phases will equate to the improved standard of living, not just for the employees and their families but also for the local business people and their families.
- ***Intentional environmental management and conservation through the off-***set program
- ***Good environmental management:*** The Environmental Authorisation together with the approved EIAR/EMPr report will guide the mine in terms of managing the physical and socio-economic environment that is impacted by the mining activities. This will be possible through the implementation of the requirements and conditions of the Environmental Authorisation and the approved EIAR/EMP report.

13.2. Negative Impacts

- ***Surface, ground water and soil pollution:*** Waste storage such as waste rock dump, and hydro carbons and other industrial liquids storage pose risks of surface water, ground water and soil contamination. These potential impacts can however be mitigated by a properly implemented storm water management system and proper management of risk sources and activities.
- ***Air Pollution:*** The use of the dusty access roads and the excavation or mining will cause dust. Dust will also be generated during blasting activities. However, potential impact of dust dispersal can be minimised if mitigation measures are complied with.
- Blasting effects: blasting has potential "tangible" and perceived effects on property and people. The application of the mitigation measures provided will reduce the significance of the impact.
- ***Noise:*** The crushing, screening& processing plant, blasting, machinery used on site and the movement of the mine's vehicles, all causes noise. The noise levels depend on the type of equipment and activity. The mining activity noise level may only cover the immediate surround while the blasting noise level and vibration may go over the immediate site.
- ***life disruption/change:*** The mining activity will may disrupt and or may alter the daily routine, community settings and lifestyles of the local community. This potential impact has both good and negative advantages. However, the application of the mitigation measures provided will minimise the negative and enhance the positive
- ***Safety risk to community and employees:*** The mining and related activities such as the use of the road by the mining vehicles pose a safety risk to the employees and to the community members using the roads.
- ***Removal of vegetation: This*** removal of vegetation will leave the ground bare and prone to erosion**. The removal of indigenous natural forest has even greater impact.**
- ***Impacts on protected sensitive ecosystems:*** a portion of the mining area Forms part of the irreplaceable CBA.
- ***Soil erosion & siltation of the rivers course*****:** Soil erosion on denuded areas (and top soil stockpile) is a potential negative impact on land capability. In addition, the

eroded silt end up in the river course. The mitigation measures provided for this impact will reduce and or prevent the impact.

- ***Habitat destruction:*** Types of habitats vary in the proposed area. The soil/ground is the habitat to organisms such as the worms and the ants. The trees and bushes also are a home to other animal species. In essence, any activity or infrastructure that will be undertaken or placed on the ground and impacts on the plants will be impacting on the habitat of a certain animal species. Mitigation to this impact has been is provided
- ***Impacts of drainage.:*** Accumulation of water into the pits (damming) and the change in drainage lines or patterns area an expected impact. the storm water management plan must be implemented to reduce this impact.
- Visual impact by mining infrastructure and activities
- Impact on Heritage resources
- Change of land use to mining
- Impacts on (water)springs and wetland.

14. THE POSSIBLE MITIGATION MEASURES THAT COULD BE APPLIED AND THE LEVEL OF RISK.

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment/ discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered).

The possible mitigation measures that could be applied and the risk level are outlined in **table 27** overleaf.

Table 28:Possible mitigation measures that could be applied and the level of risk

List of potential Impacts	Possible mitigation measures	Level of risk
Surface and ground water pollution	• Construct berm walls around the pits to avoid dirty water running off into the environment. • Maintenance of machinery/ plant to avoid failure • Pump out water to keep the containment empty and minimise seepage. • Monitor ground and surface water Monthly to check if the water quality is being impacted. • Contain hydrocarbons at the impermeable lockable storage. • Place drip trays under parked vehicles and machineries to contain any unnoticed leakage. • Ensure the stormwater management system complies with GN 704. • Install a class D engineered base for the waste rock and process waste dump • Ensure a proper lining for each PCD • Design or shape the waste rock dump to encourage free drainage to keep the Waste rock dump as dry as possible • Install subsurface drainage system to allow the surface and subsurface water flow • Monitor groundwater quality • Ensure PCD sizing complies with GN 704,	The level of risk is high to medium before the implementation of the mitigation measures and medium to low after implementing the mitigation measures.

List of potential Impacts	Possible mitigation measures	Level of risk
	• ensure a 0.8m freeboard is maintained at all times. • Runoff should be controlled and analysed before release to the catchment. • Store all chemicals used on the site in bunded areas and • Handle and dispose of the hydrocarbons and industrial liquids as required	
Increase in noise levels	• Service equipment, machineries, trucks and other vehicles regularly to minimise noise. • Provide ear plugs to employees and ensure they wear them for the protection of their ears. • Alert the community and road users of blasting times at least a week in advance so they can be prepared. • Provide a blasting schedule that considers the community and the road users, with blasting occurring during low peak periods • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit • air pressure discharge valves must have attenuators.	The level of risk is medium before the implementation of the mitigation measures and the risk will be low or even lower after implementing the mitigation measures.

List of potential Impacts	Possible mitigation measures	Level of risk
	• relocate the adjacent homestead to at least 600m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.	
Air Pollution	• Water that is sufficient to supress dust and not allow it to escape into the atmosphere should be sprayed with a pipe however the volume of water used should not cause surface water runoff and removal of topsoil • Regulate speed to be 40 km/h on site to reduce dust emission. • Consider prevalent winds during blasting and ensure that you don't blast during windy days • Provide a blasting schedule that takes into consideration community activities	The level of risk is high before the implementation of the mitigation measures and the can be reduced to medium or low after implementing the mitigation measures.
Habitat destruction:	• Use the mobile infrastructure where possible to avoid removal of vegetation • Where no mobile infrastructure is available construct the infrastructure on a disturbed area • Rehabilitate and revegetate denuded areas as soon as possible	The level of risk for removal of vegetation is high on commencement of the mining activities
Loss of geology	• The activity includes mining of rocks therefore loss of geology will occur from the commencement of the proposed activity	The level of risk for loss of geology is high on commencement of

List of potential Impacts	Possible mitigation measures	Level of risk
		mining activities and reduced after rehabilitation by backfilling with the waste rock, dry stack material and overburden.
Change of topography	• The activity will change the general topology of the area around the site in relation to the site	The level of risk on commencement of the mining activities will increase to high and throughout the life span of the mine.
-Soil erosion -Habitat destruction	• Machinery and vehicles to be used on site should be properly maintained • Ensure that they are drip trays for vehicles parked which operating on site to mitigate soil contamination by oil • To minimise significant habitat destruction, ensure that vegetation clearance should only occur were mining activities occur, were stockpiling occur, where the site will be demarcated, plant area and were associated infrastructure will be built	The level of risk will be high and can be reduced to medium or low during implementation of mitigation measures
Accumulation of water into the pits.	• Construct trenches around the pits to avoid water flowing into the pit	The level of risk is low after implementing the mitigation Measures

List of potential Impacts	Possible mitigation measures	Level of risk
Impact or loss of sensitive plant species during construction and operational phase .	• Ensure that the disturbed footprint is kept to a minimum, • Areas to be cleared should be demarcated • Construction personnel should be restricted to the construction area and access to the surrounding area controlled and monitored. • All alien plants present at the site should be controlled at least annually using the best practice methods for the species present.	Level of risk will be much lower after applying the mitigation measures.
Impacts on fauna	• Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. • All staff and contractors should undergo an environmental induction course by the ECO. • Fires should only be allowed within fire-safe demarcated areas. • All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill. • The site must be fenced, • Domestic waste mitigation measures to prevent an increase of scavengers • No unauthorized persons should be allowed onto the site.	Level of risk will be on medium to low after applying the mitigation measures.

List of potential Impacts	Possible mitigation measures	Level of risk
	• Staff present during the operational phase should receive environmental education so as to ensure that that no hunting, killing or harvesting of plants and animals occurs.	
Increased alien plant invasion	• Soil disturbance and vegetation clearing should be kept to minimum. • Cleared areas that are not going to be used should be re-vegetated with locally-collected seed of indigenous species. • Regular monitoring to ensure that alien plants are not increasing as a result of the disturbance that has taken place. • All alien plants present at the site should be controlled at least annually using the best practice methods for the species present.	Level of risk will be much lower after applying the mitigation measures.
Impact on heritage resources	• If a heritage feature is identified at any phase of the proposed activity, the heritage feature should be fenced and left undisturbed and a heritage specialist must be appointed immediately to conduct a Heritage Impact Assessment study in accordance to the SAHRA.	Level of risk will be much lower after applying the mitigation measures.
Soil compaction	• When stripping machinery is used for stripping, stockpiling and Backfilling/top soiling operations, it should operate when the soil moisture content is below approximately 8 % (during the dry winter months) in order to limit soil compaction and machinery getting stuck. • For use on site, tracked vehicles are more desirable than wheeled vehicles due to their lower point loading and slip, while vehicle speed	Level of risk will be much lower after applying the mitigation measures

List of potential Impacts	Possible mitigation measures	Level of risk
	should be maintained in order to reduce the duration of applied pressure, thereby minimizing compaction. • The width of the levelled or disturbed area for haul roads must be minimized as much as possible. Unnecessary dirt tracks (outside of the area to be disturbed) should not be allowed during the construction of the haul road. • Impact beyond the site boundary can be reduced by using existing roads and reducing new roads to a minimum.	
Soil erosion	• Stripped soils should be stockpiled as a berm upslope (the majority) and surrounding the disturbed areas. • The soils stripped for levelling purposes must be stockpiled as a berm along the entire length of haul roads (upslope). • Erosion control measures such as intercept drains and toe berms must be constructed where necessary. • Gravel roads must be well drained in order to limit soil erosion. • The vegetative cover on the soil stockpiles (berms) must be continually monitored in order to maintain a high basal cover. Such maintenance will limit soil erosion by both the mediums of water (runoff) and wind (dust). • The gravel haul road drainage system and surface must be well maintained in order to limit soil erosion.	Level of risk will be much lower after applying the mitigation measures.

List of potential Impacts	Possible mitigation measures	Level of risk
Increased Traffic and potential road accidents	• Ensure that drivers obey all the rules of the road. • Find a way to monitor compliance with the speed limit by mime vehicles. • Maintain the gravel road regularly; • Consult the road agency of department to ensure compliance with the road use. • Clear signage must be erected to warn road users of heavy vehicle presence	Level of risk or the impact after mitigation is considered to be medium-low

14.1. Motivation where no alternative sites were considered.

Alternatives were assessed under item 8

14.2. Statement motivating the alternative development location within the overall site.

(Provide a statement motivating the final site layout that is proposed)

See item number 8 for the motivation

15. FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGHOUT THE LIFE OF THE ACTIVITY.

(Including (i) a description of all environmental issues and risks that were identified during the environmental impact assessment process and (ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures.)

The following steps were taken in identifying, assessing and ranking the impacts and risks of the proposed project.

a) A desktop study using existing literature and ArcGIS was carried out to understand the receiving environment.
b) A site visit was undertaken to identify and ground proof all environmental features and the land cover on the receiving environment, and therefore identify potential impacts that the proposed activities may have on the environmental features and land uses.
c) Assessments by various Specialists were undertaken for the project outlining potential impact of the mine on the environment with recommended mitigation measures.

15.1. Assessment of each identified potentially significant impact and risk

(This section of the report must consider all the known typical impacts of each of the activities (including those that could or should have been identified by knowledgeable persons) and not only those that were raised by registered interested and affected parties).

Environmental Impact Assessment has been categorised into the following phases of the project:

- Construction Phase
- Operational Phase
- Decommissioning & closure Phase

15.1.1. Construction phase

This section of the environmental impact assessment provides identified impacts and risks as well as management measures for the construction phase of the project. See Table 28 below. This is a preparation phase and entails fencing the site, constructing the infrastructure that is required or support the mining activities such as roads, plant area, PCDs, WRD site, water pipeline, offices, workshop, change houses, etc.

Table 29:Construction Phase of the project.

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
Change in land use from agriculture to mining	Site Preparation for the mining area (pit)	Topography	-	6	1	4	5	55	• Demarcate construction footprint and limit activities to the demarcated footprint.	4	1	3	4	32
		Land use	-	6	1	4	5	55	• Limit all impacts only to the approved development footprint and the mining right area if necessary.	4	1	3	5	40
Air Pollution	Combustion of fuel by machinery & vehicles and emissions from exhausts, etc.	Air Quality	-	4	1	4	4	36	• Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards	2	1	4	4	28
	• Driving on unpaved roads, • Creation of dust during Site Preparation for the mine pit, mining infrastructure & supporting infrastructure and for processing plant,	Air Quality	-	4	1	4	3	27	• Suppress dust with water or environmentally friendly suppressant. • Monitor dust fallout • Vegetate soil stockpiles, berms and all exposed areas where possible • Set and ensure compliance with the speed limit on site. • Ensure that gravel roads are maintained	4	1	2	2	14

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
Climate change (cumulative impact)	• indirect Greenhouse gases from the procurement of supplies such as steel, • use of electricity and • emissions from the machineries and vehicles	Air Quality & Climate Change	-	6	5	4	5	75	• Plant trees to serve as the carbon sink and reduce carbon levels from the atmosphere • Investigate and use greener energy options such as solar to reduce electricity consumption • Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards	2	5	4	3	33
Soil contamination	• Hydrocarbon & other industrial liquids spills from ◦ storage tanks & bays ◦ machinery & vehicle leaks, ◦ refuelling spills	Soil	-	6	1	4	3	33	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ◦ accidental spillage &, ◦ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically	4	1	3	2	14

Impacts and Mitigation measures relating to the proposed project during Construction Phase															
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
	• Waste generation and improper storage								• Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Provide skip bins for construction solid waste. • Provide normal bins for litre and locate them in strategic location to reduce littering potential. • Train the construction team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste associated with construction phase activities shall be temporarily stored in proper containers and will be disposed of at a relevant registered site. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite					
Soil Erosion	• Exposed surface due to	Soil	-	8	1	3	4	48	• Demarcate construction footprint and limit activities to the demarcated footprint.	4	1	3	3	21

Impacts and Mitigation measures relating to the proposed project during Construction Phase															
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
	clearance of vegetation • Topsoil stockpile • Change in topography which aid rapid surface runoff.								• Stockpile topsoil on a flats surface and away from drainage lines to prevent soil erosion. • At the end of construction rehabilitate the disturbed areas that will not be paved and use the topsoil to aid regrowth. • Grade and landscape the construction site to reduce the runoff speed (Terracing). • Encourage vegetation growth on topsoil stockpiles and berms to reduce the erosion • Keep as much original land cover as possible • Gravel roads must be graded to aid proper drainage • Limit the stockpile height to 4m					
• Reduced land capability	• Change in land use from agriculture to mining. • Disturbance of soil profile and or soil sterilisation	Soil and land capability	-	8	1	4	5	65	• The construction or erection of infrastructures must be limited to the boundary of the demarcated footprint • When removing soil and overburden for stock piling, the topsoil, the subsoil and the waste rock and be stockpiled separately. • Ensure proper storm water management designs are in place; • Only the designated access routes are to be used to reduce any unnecessary compaction;	6	1	3	4	36

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Topsoil stockpiles are to be kept to a maximum height of 4m; • Topsoil is to be stripped when the soil is dry, as to reduce compaction; • 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 (only after alien vegetation has been removed); • The subsoil approximately 0.3 – 0.6 m thick will then be stripped and stockpiled separately; • The handling of the stripped topsoil will be minimized to ensure the soil's structure does not deteriorate significantly; • Compaction of the removed topsoil must be avoided by prohibiting traffic on stockpiles; • Topsoil stockpiles should only be used for the rehabilitation of the mined area; • The stockpiles will be vegetated in order to reduce the risk of erosion, prevent weed growth and to reinstitute					
• Loss of topsoil as an environmental	Change in land use from	Agriculture	-	8	1	4	5	65	• Only the designated access routes are to be used to reduce any unnecessary compaction;	6	1	3	4	36

Impacts and Mitigation measures relating to the proposed project during Construction Phase															
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
and agricultural resource • Loss of agricultural resources and infrastructure	agriculture and land use								• Topsoil stockpiles are to be kept to a maximum height of 4m; • Topsoil is to be stripped when the soil is dry, as to reduce compaction; • • 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 (only after alien vegetation has been removed); • • The subsoil approximately 0.3 – 0.6 m thick will be stripped and stockpiled separately; • • Compaction of the removed topsoil must be avoided by prohibiting traffic on stockpiles; • Topsoil stockpiles should only be used for the rehabilitation of the mined area; • The stockpiles will be vegetated in order to reduce the risk of erosion, prevent weed growth and to reinstitute • compensate the farmers for loss of income. •					
Noise generation and Increased noise levels	Construction vehicles traveling on access roads	Noise	-	6	1	1	5	35	• All adjacent landowners must be notified about the project prior to commencement of construction	4	1	1	5	30

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• All equipment to be adequately maintained and kept in good working order to reduce noise. • Provide workers with hearing protection (ear plugs). • Use equipment or machinery that complies with the manufacture's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirements • Work during day time only					
Vegetation and habitat destruction	Clearance of vegetation on the mining footprint	Flora	-	8	1	3	5	60	• Remove vegetation only in the designated areas • Prioritise low-sensitivity areas (disturbed areas) rather than natural areas where feasible. • Use existing roads and tracks where feasible. • No open fires must be allowed on site such as for cooking. • Prohibit harvesting of indigenous trees for firewood and indigenous flora in general. • Limit the development footprint of the proposed development as far as possible,	4	1	2	5	35

Impacts and Mitigation measures relating to the proposed project during Construction Phase															
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees. .					
	Establishment of the work servitude along the road	Flora	-	8	1	3	5	60	• Remove vegetation only in the designated areas • Use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.	4	1	2	4	28
• Vegetation, habitat &ecosystem destruction	Clearance of natural forest patches	natural forest, CBA& fauna	-	10	1	4	5	75	• remove vegetation on demarcated areas only. • instead of removing vegetation on the whole footprint at once, remove only where it is necessary for a specific period. This will allow time for animals to migrate.	6	1	3	5	45
Alien invasive establishment	removal of vegetation cover	Flora	-	8	1	4	5	65	• Compile and implement an alien invasive species management plan and implement it.	4	1	3	3	24
Loss of Faunal Life	• Habitat destruction (vegetation clearance) • Habitat fragmentation • Poaching	Fauna	-	8	2	3	4	52	• Limit development footprint to the approved demarcated plan. • Use semi-permanent means /material to demarcate or provide boundaries to construction areas to control the movement of personnel and vehicles. • No poaching is allowed. Non-compliance should carry a heavy fine.	4	2	3	3	27

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
	• Animal-vehicle collisions								• Walk the area marked for vegetation clearance and soil removal few hours before to chase small animals away to reduce number of animal fatalities. • Do not kill snakes except when there is the immediate danger posed.					
Potential for accidents and injuries to workers	Construction of the mine and supporting infrastructure as well as Road Construction	Health and Safety	-	8	1	3	4	48	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) • All employees must be given adequate Personal Protective Equipment (PPE) • Environmental and safety awareness training must be undertaken regularly	4	1	2	2	14
Groundwater pollution	Accidental Hydrocarbons Spillages during Construction of the mine and supporting infrastructure	Groundwater	-	6	3	3	4	48	• Accidental spillage must be minimised and contained. • Vehicles and equipment must be regularly serviced and maintained. • Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery • Hazardous substances must be stored in bunded areas with impermeable concrete floor and a 110% capacity of the stored substance to prevent spillages	4	2	1	2	14

Impacts and Mitigation measures relating to the proposed project during Construction Phase															
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately. • In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24hours					
Surface water contamination	• Accidental Hydrocarbons Spillages that contaminate the runoff • Improper waste management	Surface water	-	6	3	3	4	48	• Stormwater Management infrastructure must be constructed to ensure ultimate containment during the operational phase • construct subsurface drainage system for the WRD dump • All spills must be cleaned immediately. • A 100m buffer must be maintained from the edge of the Mzumbe River during mining • A 32m buffer must be maintained from the wetland. Accidental spillage must be minimised and contained.	4	2	1	2	14

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Vehicles and equipment must be regularly serviced and maintained. • Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery. • Hazardous substances must be stored in bunded areas with impermeable concrete floor and a 110% capacity of the stored substance to prevent spillages • The fuelling zone shall have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately. • In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24hours					

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
Wetland destruction	Vehicle and personnel movement in wetland areas	Wet-land and Seeps	-	8	2	4	4	56	• Install the “NO-GO ZONE” notices along the buffer area of the wetland, and • Undertake a “walk” on the boundary on the wetland to show and explain the NO-GO area to the contract workers. • Implement the storm water management system to ensure the preservation of the wetland during operational phase. • Increased runoff due to vegetation clearance and/or soil compaction must be managed by surface landscaping that will counter the speed of the runoff • Comply with additional conditions in the water use license regarding the wetland. • Flow continuity and connectivity of the freshwater features must be encouraged during construction activities.	6	2	4	2	28
Loss of habitat and wetland ecological structure Impact on the hydrological functioning of the wetland	Site preparation for the mining area (pit)	Wetland	-	8	2	4	4	56	• Flow continuity and connectivity of the freshwater features must be encouraged during construction phase. • Comply with additional conditions in the water use license regarding the wetland • All wetland areas adjacent to the mining footprint must be demarcated as no-go areas	4	1	4	3	27

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Runoff from paved surfaces should be slowed down by the strategic placement of berms; • Construct catch pits or structures to trap the eroded soil sediments before they reach the wetland and streams.					
Impact on Heritage Resources	Construction of the mine and supporting infrastructure	Heritage Resources	-	6	1	2	3	27	• Cultural sites and graves uncovered during operations will be cordoned off, marked as no-go zones, and evaluated by a specialist before proceeding with further activity. • Graves relocations must be undertaken by the specialist with the participation of the owners of the graves.	4	1	1	1	6
Increased Traffic and Traffic Disruptions	Site Preparation	Traffic	-	2	3	2	4	28	• Manage traffic properly during construction to avoid accidents and congestion • Advise road users of the detour road if available • ensure that drivers obey all the rules of the road. • Clear signage must be erected to warn road users of the presence of heavy vehicles. • The access to the mine from the main roads must be designed in such a way as to comply with National Traffic Act • Adequate signage should be erected indicating construction works during the construction phase.	2	3	2	2	14

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Adequate flagmen to be employed to assist in directing traffic, especially during peak hours					
Added traffic on the road network	Employees and laborers Including Construction materials transportation to site	Traffic	-	2	3	2	4	28	• Road network will able to support additional truck traffic	2	3	2	2	14
Poor Visibility due to dust creation	Site Preparation	Visual Impact	-	6	1	1	4	32	• Implement dust suppression techniques where necessary. • the mine to ensure that visual impacts have been adequately managed and rehabilitated, in consultation and agreement with the applicable local authorities.	4	1	1	3	18
Lighting at night	Site Preparation for the open Cast pit mining	People and animals		6	1	2	4	36	• The mitigation is to install the lights so that it is minimally directed toward the forest and more toward the community. This neutral mass lighting may impact the nocturnal animals in the nearby bush ecosystem and the mass lighting may also enhance security in the nearby residential area.	6	1	2	2	18
Littering on site.	Site Preparation	Waste management	-	8	1	2	5	55	• Littering is prohibited, and all waste generated from the site should be cleared regularly to a licensed facility. • A ‘NO LITTERING & NO DUMPING” sign should also be placed on site.	4	1	1	3	18

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Store waste in labelled containers (waste sorting), indicating clearly whether the waste is hazardous or non-hazardous • All waste generated on-site must be collected and transported to the nearest registered landfill site. • Where feasible, provide the recycling/waste sorting bins for domestic waste (different bins for cans, paper, bottles, etc.). • Good housekeeping must be practiced at all times to ensure that the construction site is kept neat and tidy.					
Job Creation	Site Preparation	Socio-economic Impact	+	8	3	2	5	65	• The mine shall develop and implement a recruitment policy that allows the equal opportunity to all people • The procurement policy for the mine should encourage the use of local service providers to encourage economic growth in the area. • The mine shall communicate frequently with the affected stakeholders to ensure that they understand the processes and do not develop unrealistic expectations that may lead to ill-informed grievances.	8	3	2	5	65
Increased Social Pathologies Linked to Influx of Workers and Job Seekers	Site Preparation for the open Cast pit mining	Socio-economic Impact	-	4	4	2	4	40	• Make it compulsory for contractors to submit a transport plan to ensure that workers are transported to and from their places of residence.	4	4	2	2	20

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Should contractors and/or other persons with specialised skills not be available locally, the main contractor would be required to draw up and submit a housing plan that sets out how he will be dealing with employees from outside the municipal boundaries. • Draw up and implement a Local Employment Strategy as proposed in the Social Management Plan. • Do not create unrealistic job expectations and set clear goals with regards to local employment, employment numbers and so forth. Make this information available to the local communities; • Collaborate with surrounding landowners through forums and ensure that stakeholders are aware of contact details and the procedures to raise complaints. • Deal with illegal structures expediently, follow the correct legal procedures and support landowners in this regard. • Provision of sufficient entertainment facilities in construction camps • Liaison with police, community policing forum and security stakeholders; • Maximisation of the proportion of job opportunities allocated to locals;					

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									• Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags. • The appointed contractor should establish clear rules and regulations for access to the construction site and offices to control loitering. Consultation should occur with the local police branch to establish standard operating procedures for the control and/ or removal of loiterers. • Liaison structures are to be established with local police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations. • Limit, as far as reasonably possible, social ills caused by influx of workers and job-seekers; • Liaise openly and frequently with affected stakeholders to ensure they have information about the Project; • Extensive HIV/AIDS awareness and general health campaign. It should be noted that SA Lithium has no control over activities related to workers' behaviour, however it is recommended					

Impacts and Mitigation measures relating to the proposed project during Construction Phase														
Impact	**Source /Activity**	**Environmental Aspect**	**Nature**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance before mitigation**	**Mitigation measures**	**Magnitude**	**Extent**	**Duration**	**Probability**	**Significance after mitigation**
									that HIV/AIDS campaigns are conducted within the affected area; • Discourage influx of job-seekers by prioritising employment of unemployed members of local communities; • Liaise with the RNLM, and the Traditional Authority to ensure that expected population influx is considered in infrastructure development and spatial development planning; • Create synergies with local government IDP to promote infrastructure development; • Clear identification of workers – prevention of loitering; • Liaison with police or establish/ support community policing forum; • Community education; and Implement measures to address potential conflict between locals and non-locals.					

15.2. Operational Phase

This section of the environmental impact assessment will continue to generate impacts that require attention and if proper management strategies are not implemented the impacts would accumulate and create environmental risks.

This section **(table 29)** outline mitigation measures associated with the operational phase of the mine and the related mining infrastructures.

Table 30:Impacts Assessment related to the Operational Phase of the mine including related infrastructure.

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
Loss of geology and disruption of geological structure	Mining Activities: Open cast Excavations	Geology	-	10	1	4	5	75	• There are no mitigation measures for the loss of geology as the ore and some of the rock will not be returned to the pit. • To reduce the impact of disrupted geological structure when backfilling, stockpile the different overburden separately; the topsoil, subsoil and waste rock • Proper rehabilitation must be implemented. Where the backfilling is undertaken intentionally and systematically- with the waste/parent rock back first and followed by the subsoil and finally the topsoil. Mining must only be undertaken within the mining right and approved footprint.	5	1	4	5	50

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
Modified topography of the site	• Mining Activities: • Open cast pit development • waste rock stockpiling • Topsoil stockpiling	Visual/Topography	-	8	1	4	5	65	• Undertake concurrent rehabilitation throughout the operational phase grade the slopes of the rehabilitated pit area in a way that they will resemble the local topography. • The height of the stockpiles must not exceed 40m after rehabilitation • Encourage revegetating of the soils stockpiles to blend in with the surrounding	4	1	3	5	40
Increased noise levels	Mining Activities	Animals people (Employees and community)	-	8	1	4	5	65	• Service equipment, machineries, trucks and other vehicles regularly to minimise noise. • Provide ear plugs to employees and ensure they wear them for the protection of their ears.	4	1	4	2	18

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Alert the community and road users of blasting times at least a week in advance so they can be prepared. • Provide a blasting schedule that considers the community and the road users, with blasting occurring during low peak periods • limit activities that course high noise levels between 6am and 8pm (except for the plant) • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• air pressure discharge valves must have attenuators. • relocate the adjacent homestead to at least 500m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.					
Increased noise levels	Use of the road and transport to/from the site of people, material	Animals and people (Employees and community)	-	8	1	3	4	48	• Speed limits must be kept low, • Mining equipment must be serviced regularly. • limit activities that course high noise levels between 6am and 8pm (except for the plant)	6	1	2	3	27

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
	supplies and ore								• any tonal alarms that are used during the day must not be audible to any of the receptors • relocate the adjacent homestead to at least 500m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.					
	Processing of ore in the processing plant	Animals and people (Employees and community)	-	6	1	2	3	27	• The plant must be maintained and be serviced regularly	2	1	2	2	10

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
Establishment of Alien invasive species	Removal of vegetation, soil and waste rock stockpiles, erosion of topsoil Mining,	Flora	-	8	1	2	4	44	• Develop and implement an invasive plant management plan throughout the lifespan of the project. • The monitoring of invasive species must be undertaken on a scheduled timeframe and will be allocated to a specific responsible person	4	1	1	3	18
Vegetation and habitat destruction	• Removal of vegetation for mining activity & infrastructure • Dust dispersal from	natural forest and fauna	-	10	1	4	5	75	• Restrict vegetation removal to the required footprint at a specific time period. Avoid vegetation removal for activities that will occur later. • Suppress dust adequately (to minimise deposition on the plants • Monitor dust fall monthly (to confirm the efficiency of dust suppression. • Monitor the groundwater quality timeously	10	1	3	4	56

Mine Operational Phase Impacts and Mitigation														
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	mining and road use, • Groundwater pollution by hydrocarbons spills								• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ○ accidental spillage &, ○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically					
Soil Compaction	• Movement of vehicles & machinery	Soil and land capability	-	6	2	3	4	44	• Vehicles must stick to the designated roadways/pathways to eliminate soil compaction in areas not designated for disturbance.	4	2	2	3	24

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
	• waste rock stockpiling								• If possible, remove the topsoil on the waste rock dump footprint and stockpile it for use during rehabilitation. • Rip & rehabilitate the compacted areas once the activity is completed					
Soil & water Contamination	• Hydrocarbons spills • Waste rock leaching &seepage • Improper waste management	Soil and water and waste management	-	8	1	3	4	48	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ○ accidental spillage &, ○ spillage caused by flooding or storm damage.	8	1	2	2	22

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks • A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material. • Drill groundwater monitoring boreholes and monitor them monthly for early detection of water pollution					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Line the waste rock site with a Class D engineered base and shape the stockpile to encourage runoff. • Runoff-water from the WRD stockpile must be captured and re-used in the system. • Install leak detectors around the waste rock dump and monitor them weekly as recommended by supplier. Seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Spill kits will be provided for onsite spill cleaning. • Provide skip bins for construction solid waste. • Provide normal bins for litter and locate them in strategic location to reduce littering potential. • Train the mining team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste shall be temporarily stored in proper containers and will be disposed of at a relevant registered site timeously. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• A clearly defined waste management plan must be compiled and implemented					
Increased risk to public and worker safety:	Mining excavations, use of roads, and Ore Processing in the Processing plant	Health and Safety	-	8	1	2	4	44	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • All employees must be given adequate Personal Protective Equipment (PPE) including dust masks • Environmental and safety awareness training to be held frequently with workers. • All incidents must be recorded and rectified. The record must be filed on site	4	1	2	2	14

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• The mine must be fenced off to control access.					
Increased risk to public safety:	Mining Activities:	Health and Safety	-	8	1	2	4	44	• Blasting must be undertaken by a certified person • Notify the public of the blasting dates and times • Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • Undertake annual community health, safety and environmental awareness drive	4	1	2	2	14
Potential for accidents and injuries to the workers.	Mining Activities	Health and Safety	-	8	1	2	4	44	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) • Provide all employees with adequate Personal Protective Equipment (PPE)	4	1	2	2	14

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									Environmental and safety awareness training to be held frequently with workers					
Potential increase of veld fires	• Cigarette stumps • Creation of fires onsite • Burning of waste	Fire control	-	4	1	1	2	12	• Open fire is prohibited on site. • Designate smoking areas and provide a bin for cigarette stumps to avoid accidental fires. • Burning of rubbish or any material is prohibited on site. • Training of staff must include fire prevention	4	1	1	1	6
• Loss of Agricultural resource Loss of topsoil as a resource	Change in land use to mining	Agriculture	-	8	1	3	5	60	• Ensure proper stormwater management designs are in place to minimise erosion • remove vegetation on demarcated areas only and • stockpile the topsoil for use during rehabilitation	8	1	3	3	36

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
• Loss of Agricultural income									• Only the designated access routes are to be used to reduce any unnecessary compaction; • Topsoil stockpiles are to be kept to a maximum height of 4m; • Topsoil is to be stripped when the soil is dry, as to reduce compaction; • • 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 (only after alien vegetation has been removed); • • The subsoil approximately 0.3 – 0.6 m thick will be stripped and stockpiled separately;					

Mine Operational Phase Impacts and Mitigation														
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									• Compaction of the removed topsoil must be avoided by prohibiting traffic on stockpiles; • Topsoil stockpiles should only be used for the rehabilitation of the mined area; • The stockpiles will be vegetated in order to reduce the risk of erosion, prevent weed growth and to reinstitute • compensate the farmers for loss of income.					

Mine Operational Phase Impacts and Mitigation														
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Ground water Pollution	• Hydrocarbons spills • Waste rock leaching	Ground water	-	8	2	4	3	42	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ○ accidental spillage &, ○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump-equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks	6	2	1	2	18

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material. • Drill groundwater monitoring boreholes and monitor them monthly for early detection water pollution Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Install leak detectors around the waster rock dump and monitor them weekly as recommended by supplier.					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination • Spill kits will be provided for onsite spill clearing. • Train the relevant mining team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Vehicles and equipment must be serviced regularly. • . • Drip trays must be placed under parked vehicles and machinery • All water within the mine footprint area will be regarded as dirty					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• The groundwater resources must be monitored as required by the DWS. • Should impacts on groundwater be encountered an independent groundwater specialist will be appointed to investigate and provide the action. • A clearly defined waste management plan must be compiled and implemented					
High rate of groundwater ingress causing flooding of the pit	Mining Excavations Operation	Ground water	-	6	2	4	4	48	• the storm water system must be designed to divert the runoff away within the site from the pit into the storm water dam and the runoff offsite to the environment	6	2	4	2	24
Soil erosion, stream		Surface water	-	6	2	2	3	33	• the storm water system must be designed to channel runoff onsite into	4	2	2	2	16

Mine Operational Phase Impacts and Mitigation														
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sedimentation and increased runoff speed	• Vegetation removal and • change in drainage system onsite , • transport of ore and waste rock to the plant and the waste rock dump • water course crossings								the storm water dam and the runoff offsite to the environment with silt traps • clean up silt traps after every rain • The slopes must be profiled to prevent excessive erosion and reduce surface runoff speed. • Implement a stormwater management plan. • Where possible, design the mining area in a terracing model to reduce erosion. • Establish vegetation around disturbed areas to prevent any erosion; • Monitor erosion on site (in vulnerable areas) monthly by taking photographs and compile a findings report quarterly with action plans where required					

Mine Operational Phase Impacts and Mitigation														
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									• Trucks must not be overloaded with ore to avoid spillages of ore and rock that can be washed to the streams. • Before the completion of the storm water management system, clean up all ore and rock spills off the surface					
Surface water Pollution and disturbance of the flow of water	• hydrocarbon spills • poor waste management (sewage, mining and general waste)	Surface water	-	6	2	3	3	33	• Store fuel, chemicals, and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent. ○ accidental spillage &, ○ spillage caused by flooding or storm damage.	4	2	2	2	16

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
	• Mining infrastructure over drainage line, • Pump equipment on the riverbank • mining activities • existence of culverts and water crossings								• The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Provide drip trays under packed machinery • A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material.					

Mine Operational Phase Impacts and Mitigation														
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									• Stormwater Management Plan implemented and maintained to ensure efficiency. • Install subsurface drainage system for the WRD • capture and contain the return water from the process and the WRD • Minor spillages must be cleaned using spill kits • A 100m buffer must be maintained from the edge of the Umzumbe River during mining. • Remove litter & debris to stop blocking culverts and water channels. • Spill kits will be provided for onsite spill clearing. • Provide skip bins for construction solid waste.					

Mine Operational Phase Impacts and Mitigation														
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									• Provide normal bins for litter and locate them in strategic location to reduce littering potential. • Train the mining team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste shall be temporarily stored in proper containers and will be disposed of at a relevant registered site timeously. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite • Undertake regular structural inspections of pumps and pipes exiting pit;					

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									• Ensure groundwater investigation is done to understand groundwater levels; • Stormwater culverts and clean water diversions should be designed and constructed to accommodate 1:50-year storm event.					
Impact on the aquatic life	Abstraction of water from the Umzumbe River Sewage contamination	Aquatic life	-	8	2	3	4	52	• Obtain a water use license to abstract water from the river • Undertake biomonitoring every 3 months for the initial year to check impacts on the invertebrates. • undertake biomonitoring biannually from year 2 onwards (based on the recommendation of the year one specialist report) • service the sewage system regularly to avoid spills.	8	2	3	2	26

Mine Operational Phase Impacts and Mitigation														
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									• in case of a blockage/spill, contain in onsite, fix & clean immediately					
• Loss of habitat and wetland ecological structure • Impact on the hydro-logical functioning of the wetland • disrupting the flow of water	Operation of the mine and maintenance of infrastructure	Wetland	-	6	2	4	4	48	• Flow continuity and connectivity of the freshwater features must be reinstated post- construction activities; • Remove litter & debris to stop blocking from drainage lines. • Regular monitoring of water quality must be implemented in order to ensure the impacts of runoff and decant of water into wetland resources are prevented or minimized. • All wetland areas adjacent to the operational footprint will be demarcated as no-go areas. • obtain a water use license for destruction the destruction of the artificial wetland next to the pit site	4	2	4	3	30

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									• Adequate stormwater management must be incorporated into the design of the proposed development throughout all phases in order to prevent erosion of topsoil and the loss of floral and faunal habitat. In this regard, special mention is made of: Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed; • Runoff from paved surfaces should be slowed down by the strategic placement of berms; • All topsoil and waste stockpiles must have berms and catchment paddocks at their toe to contain runoff of the facilities.					

Mine Operational Phase Impacts and Mitigation														
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Impact on heritage resources	• Mining activities, • Movement onsite • Maintenance of infrastructure	Heritage Resources	-	6	1	2	3	27	• Should artifacts or archaeological items be found during mining, use the chance find procedure to cater for accidental finds. • workers must be educated about the value of historical buildings and structures. • Mark and Cordon discovered heritage resources (old buildings and graves)	4	1	1	1	6
Air Pollution	Dust generation by vehicles, machinery, soil erosion by wind and blasting	Air quality and people	-	6	2	2	4	40	• Dust suppression measures such as spraying of water on the site access route and around the site must be implemented. • Increase dust suppression efforts during conditions that aid excessive dust dispersal • Areas with difficulty to manage fallout dust and erosion may be treated with	4	1	1	3	18

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									environmental-friendly chemical dust suppressant as opposed to using water • Speed limits must be established and enforced on-site and, on the road, to minimise dust dispersal. • Where necessary, cover the trucks carrying ore to the plant and waste to rock dump with tarpaulin • Encourage revegetation on soil stockpiles to reduce erosion by the wind					
	Emissions of noxious gases from machinery & vehicles exhausts,	Air Quality	-	8	1	4	2	26	• Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards	2	1	2	2	10

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	processing plant.								• The plant must comply with air quality act emission standards.					
Air Pollution	Ore Processing in the processing plant	Air quality	-	6	2	2	4	40	• The plant must comply with the air quality act and emit emission.	4	1	1	3	18
	Transportation of ore to the plant and waste from the processing plant to the waste rock dump area.	Air quality/ Visual Impact	-	6	2	2	4	40	• Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions • Ore to the plant and waste to waste rock dump in trucks must be covered	4	1	1	3	18

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Cumulative Climate change impact	Direct and in-direct emissions from the exhaust, electricity consumption and mining supplies	Air Quality & Climate Change	-	4	4	5	5	65	▪ Where possible, supplement electricity from the Eskom grid with appropriate alternative renewable energy sources. ▪ Plant trees annually to serve as the project's carbon sink. ▪ Service the machinery regularly to ensure emission according to manufacturer standards.	4	4	4	5	Climate
Land & ambiance/ aesthetics pollution	• Poor waste management • Poor management/ no	land and ambiance	-	4	2	4	3	30	• Waste disposal areas and bins will be placed strategically to encourage proper disposal on-site. • Waste generated onsite must be disposed of weekly at the nearest registered landfill or placed for pick up by the municipality • Maintain the sewage system regularly.	3	2	4	2	18

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	maintenance of sewage system • Poor house keeping								• Appoint qualified person to maintain the sewage system. Waste rock must only be disposed on the designated footprint • A clearly defined waste management plan must be compiled and implemented					
Impact on the road network	• Increase in traffic flow by additional vehicles and trucks to and from the mine	Traffic	-	6	3	2	4	45	• Ensure that the road network is able to support additional truck traffic. • Traffic control measures aimed at reducing the entrainment of material by restricting traffic volumes and reducing vehicle speeds. • Speed limits will be established and enforced on the mine to minimise accidents	4	1	2	3	21

Mine Operational Phase Impacts and Mitigation														
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	• Damage to the road infrastructure								• Traffic signs to be put around the site to notify motorists and drivers about mining activities. • Deliveries and transportation should be carried out outside of peak traffic hours					
vibration and sudden noise increase	Blasting	Animals and people (Employees and community)	-	10	2	2	4	56	• Blasting must be done by qualified persons only • Communicate by notice bards and other mease of the planned blasting2 to 3 days before it is undertaken	6	2	2	2	20
Damage to property (houses, communication tower, cars, roads etc) .	Blasting	Ground vibration and air blast	-	6	2	2	5	50	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, using electronic initiation to obtain single hole firing. Relocation of households within 500 m from the pit area.	6	2	2	2	20

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Injury / Fatality (people and/or animals) •	Blasting	Air blast & Fly rock	-	10	2	2	5	70	• This specific blast design must be implemented: ∞ shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect. • Use of specific stemming to manage fly rock - crushed aggregate of specific size. • Re-design with increased stemming lengths. • Relocate households within 500 m from the pit area. • Evacuation of people and animals out of danger zone defined by mine COP. (minimum 500 m.)	6	2	2	2	20
Fly Rock in dam	Blasting	Fly rock	-	6	2	2	5	50		6	2	2	2	20
Fly Rock damage at the Communication tower	Blasting	Fly rock	-	8	2	2	5	60		6	2	2	2	20

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Undertake structural survey for houses within 1km radius boundary of the mining right area.					
Socio-economic Aspect														
Creation of Employment and business opportunities	Mining and related activities (mining jobs, subcontracts, suppliers)	Socio-economic benefit	+	8	3	2	4	52	• Prioritise the local people in employment and business opportunities • Local businesses must be given preference in appointments • Employment criteria must be communicated to the community in advance (e.g. in newspapers, KwaMadlala Mining committee, community notice boards, etc);					
Increase in population	Influx of people in to the local	Socio-Economic	-	8	3	4	5	80	• Local labour must be employed as far as possible;	4	3	3	4	40

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
size of the local community/ town	community and town for economic opportunities													
Increased social pathologies linked to influx of workers and job seekers	Influx of people in to the local community and town for economic opportunities	Socio-economic Aspect	-	6	3	5	5	70	• HIV/AIDS, drug abuse and domestic violence awareness campaigns. • A voluntary counselling and testing (VCT) programme should be introduced. • Align awareness campaigns with those of other organisations in the area. • To limit, as far as reasonably possible, social ills caused by influx of workers and job-seekers; • To liaise openly and frequently with affected stakeholders to ensure they have information about the Project.	6	3	5	3	42

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• To make available, maintain and effectively implement a grievance/complaint register that is easily accessible to all neighbours and affected stakeholders.					
Spread of Communicable Diseases	In-Migration	Human Health	-	6	2	3	3	33	• Collaborate with the DoH on awareness-creation around vaccinations for communicable diseases for vulnerable sub-populations such as children and old people; • Labour policies should encourage hiring of local staff to avoid excessive job-seeking migrants. The Project should not hire at the “front gate” but consider a recruitment office at an off-site location. This will need to consider	2	2	3	2	18

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									national recruitment and employment requirements; • Reduce the prevalence of communicable diseases by collaborating with relevant government departments and schools for awareness creation and improved understanding of factors exacerbating communicable diseases, including coping strategies that result in behaviour change; and initiating competitions at schools for illustrating innovative ways to improve conditions at home - either by reducing exposure and susceptibility or increasing coping capability. • Support community-based information campaigns related to TB symptoms					

Mine Operational Phase Impacts and Mitigation															
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									and the need to seek care. The campaign should address the risk of co-infection between HIV and TB; • Influx management and advice with regards to town planning to prevent overcrowding; and • Develop partnerships to support the community-based TB control programs in conjunction with the DoH and any NGOs. This needs to include case detection, management and surveillance activities under the national TB program policy and strategy.					
Community and employee	Mining operation and the use of commercial	Human Injuries	-	8	3	5	4	64	• Engage the Local Municipality and interested and affected parties to assist with programmes targeted at improving	4	3	4	2	22

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
health and safety	trucks and machinery								traffic management and road safety in the study area; • Develop a clear policy for the management of emergencies or accidents in the community as a direct result of the activities of the project;					
Noise, air quality and hazardous material	• Blasting and other mining activities	Human Health	-	8	2	3	3	39	• All employees and contractors should receive Health and Safety induction that includes an environmental awareness component (noise). This is to allow employees and contractors to realise the potential noise risks that activities (especially night-time activities) pose to the surrounding environment.	6	2	3	3	33

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Place a complaints and input register at the gate for interested and affected parties • to lodge their complaint The mine must investigate any reasonable • The mine investigates the use of white-noise alarms instead of tonal reverse alarms on heavy vehicles operating on roads, within the mining area and at stockpile areas; • Develop a dust management plan; Apply wetting agents, dust suppressant or binders on the exposed area; • Vegetate, with grass or a gravel monolayer, the exposed areas;					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Reduce erosion loss by roughening slope surface - this dissipates energy of water or wind moving over the slope; • Assess the angle of the slope, as maximum erosion occurs on slopes with angles between 30° and 35°. • Improve upon the surface strength of a slope, which will lower the rate of erosion; • Implement PM monitoring and continue with ongoing dust fallout monitoring. • Collect data on a longitudinal basis from the local health centres on incidence of increased respiratory disease - especially respiratory tract infections that could be ascribed to dust. While these may not be					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									specifically ascribed to the Project, the prevailing trends are useful to monitor so that any concerns could be addressed. This may require health systems strengthening to support recording; and • Establish a monthly and annual reporting structure to appraise performance, compliance and complaints. • A comprehensive, continuous air quality monitoring programme must be undertaken to ensure that mitigation measures are applied at all times to keep ambient air concentrations of PM_{10} and $PM_{2.5}$ within the NAAQS over residential areas;					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									• Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective; • Develop and implement a Storm Water Management Plan; • Undertake groundwater and surface water monitoring; • seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination					
Increased GBV, Crime alcohol and drug abuse	In- Migration	Human, social and economic	-	8	4	4	4	64	• Reduce substance-abuse and improve social cohesion by: ✓ Conducting substance-abuse prevention education programs in the schools within the Potentially Affected	4	3	4	3	33

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									Communities (Umzumbe and surrounds); ✓ Providing recreational facilities for workers without families; ✓ Contributing to the establishment of appropriate community recreation facilities- considering needs and assets of the community; ✓ Collaborating with the relevant authorities to establish a system to monitor violence and community cohesion related to Project activities – provide technical skills; ✓ Participating in violence-prevention education programs, particularly focusing on gender violence and tribalism.					

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
									✓ Supporting education programs with a gender equity focus; ✓ Identify and support vulnerable groups; and • Support graduate training programs for the youth in the community					
Bad lifestyle habits	Mining employment	Human Health	-	8	2	3	3	39	• Support health education programs as part of a community-based peer health educator program; • Support the local healthcare personnel with training on disease-management programs and the recognition of NCD symptoms and management thereof.	6	2	3	3	33
Non-compliance	Impact of non-compliance with the EMP	Environmental & socioeconomic aspect	-	8	1	4	5	65	• Undertake an internal EMP audit quarterly and address the non-compliances within the time frame of the approved action plan	8	1	4	3	39

Mine Operational Phase Impacts and Mitigation														
Impact	**Source /Activity**	**Aspect Impacted**	**Nature**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance before mitigation**	**Mitigation measures**	**Magnitud**	**Extent**	**Duration**	**Probabilit**	**Significance after mitigation**
	by the developer								• Undertake an Independent EMP audit annually and address the non-compliances within the time frame of the approved action plan • Place complaints and input book at the gate to allow recoding of non-compliances observed by I&Aps and address complaints or non-compliances.					

15.3. Decommissioning, Rehabilitation and Closure Phase

Decommissioning, rehabilitation and closure is a phase that seeks to bring restoration to the disturbed area. However, the rehabilitation activities has negative impacts that need to be managed to ensure meeting the goal of restoration. **Table 30** below describes the impacts associated with this phase, their mitigation measures, and the impact rating pre and post mitigation implementation.

Table 31:Impacts and Mitigation measures during Decommissioning Phase of the project.

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Improved impact on the topography	Rehabilitation activities	• Visual • Topography	-	8	1	4	5	65	• Undertake concurrent rehabilitation throughout the operational phase and grade slopes of the pit area in a way that they will resemble the local topography. • Backfill the pit with the waste rock, dry stack cakes and the soil stockpiles. • Grade/shape the mining area and remaining landforms to blend with the surrounding • Encourage revegetating of the soils stockpiles to blend in with the surrounding • The area must be shaped to be free draining.	6	1	2	2	18

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Improved soil conditions, and restoration of land use (agriculture)	Removal of mining infrastructure and soil amelioration	Soil and land Capability	+	6	1	3	4	40	• Implement the rehabilitation plan • Revegetate as quickly as possible to limit erosion and sedimentation in downstream water resources. • Vehicles must stick to the designated roadways/pathways to eliminate soil compaction in areas not designated for disturbance. • Rip & rehabilitate the compacted areas once the activity is completed. • Rehabilitated areas must be fenced off until it is determined that the landscape is stable.	6	1	5	4	48
Soil & water Contamination	• Spillage of hydrocarbons	• Soil • Water • waste mana	-	8	1	3	4	48	• The fuelling zone must have an impermeable concrete slab with a pump-equipped sump to collect potential spills automatically.	8	1	2	2	22

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
	• Removal of mining Infrastructure • Leaching of remaining waste rock & backfilled pit	gement							• Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Spill kits will be provided for onsite spill cleaning. • Place drip tray under packed vehicles. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite • waste management plan must be implemented. • Monitor the ground water for leaching potential from the operational phase to post closure					

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Air Pollution	• Removal of mining infrastructure • Emissions of noxious gases from machinery & exhausts	Air Quality and Visual Aspects	-	6	1	2	3	27	• Where possible, use machineries/equipment with low emission potential. • Service the machinery regularly to ensure emission according to manufacturer standards	4	1	2	2	14
Air Pollution	Vehicles movement	Air Quality and Visual Aspects	-	6	2	2	4	40	• Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions • Speed limits will be established and enforced on the mine to minimise dust generation.	4	1	1	3	18

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Water Pollution	• Closure Period • Rehabilitation activities	Surface water	-	6	1	4	3	33	• Storm water Management Plan must be maintained until rehabilitation activities have been completed and the area is regarded as stable. • At that stage, the infrastructure will be removed and the area will be shaped to ensure free drainage.	4	1	4	2	18
• Loss of habitat and wetland ecological structure • Impact on the hydrological functioning of the wetland	• Closure Period • Rehabilitation activities	Wetland	-	8	2	3	4	52	• Regular monitoring of water quality must be implemented in order to ensure the impacts of runoff and decant of water into wetland resources are prevented or minimized. • All wetland areas adjacent to the operational footprint will be demarcated as no-go areas. • Adequate stormwater management must be incorporated into the	6	2	4	2	24

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
• disrupting the flow of water									design of the proposed development throughout all phases in order to prevent erosion of topsoil and the loss of floral and faunal habitat. In this regard, special mention is made of: Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed; • Rehabilitation should be conducted in a manner that ensures wetland features' conditions are reinstated to natural state as possible.					
Impact on Heritage Sites	• Removal of mining infrastructure • Closure	Heritage Impacts	-	6	1	2	3	27	• Should artifacts or archaeological items be found during rehabilitation activities, use the chance find procedure to cater for accidental finds.	4	1	1	1	6

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Improved Visual Impact	• Removal of mining infrastructure • Closure Period	Visual Impacts	-	6	1	5	5	60	• Removal of infrastructure must improve the general visual impact of the area. • Consideration must be given to the existing sense of place for the region	6	1	5	3	36
Disrupted geological structure	Rehabilitation activities.	Geology	-	10	1	4	5	80	• Undertake concurrent rehabilitation throughout the operational phase by backfilling the pit. • Backfilling must be undertaken intentionally and systematically- with the waste/parent rock backfilling first and followed by the subsoil and finally the topsoil.	10	1	2	3	33
Improvement on vegetation	Rehabilitation activities	Flora	+	6	1	3	3	30	• The rehabilitation activities must be undertaken in such a manner to promote the self-succession of vegetation.	6	1	3	4	40

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
									• implement an invasive plant management plan throughout the lifespan of the project • Rehabilitated areas must be fenced off up until it is determined that the landscape is stable. • The monitoring of invasive species must be undertaken on a scheduled timeframe					
Conversion and diversification of land use	Social Change Process: Geographic processes	Socio-Economic	+	6	1	2	3	27	• Educate landowners in terms of their rights and responsibilities prior to the project going ahead and expectations during rehabilitation.	4	1	2	3	21
Employment and training opportunities	Mining operation and the use of commercial	Human social and economic	+	8	4	4	4	64	• Develop and implement an integrated Mine Closure Plan with the input of the interested and affected parties.	8	5	4	4	68

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
	trucks and machinery								• Develop an exit strategy for any social projects that were implemented during the operational phase in advance before the closure of the project. • Follow a clear communication strategy to inform the local community of arrangements made related to social spending and project closure. Stakeholder engagement and communication should also be in advance prior to closure. • Proactively assess and manage the social and economic impacts on individuals, regions, and economies where retrenchment and/or closure of the Project are certain					

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
									• Develop mechanisms to assist employees prior to retrenchment in the transition phase. • This includes offering portable skilled development programmes during the operational phase, providing assistance in assessing available and suitable jobs with other local mines or companies, provide positions during the maintenance and rehabilitation phase. • Include non-core-related local supply links during the operational phase to facilitate easier transitioning from local suppliers to other industries.					

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
Risk to public and worker safety:	Rehabilitation activities	Health and Safety	-	8	1	2	4	44	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • All employees must be given adequate Personal Protective Equipment (PPE) including dust masks • Environmental and safety awareness training to be held frequently with workers. • The mine must be fenced off to control access.	4	1	2	2	14
Potential increase of veld fires	• Cigarette stumps • Creation of fires onsite	Fire control	-	4	1	1	2	12	• Open fire is prohibited on site. • Designate smoking areas and provide a bin for cigarette stumps to avoid accidental fires. • Burning of rubbish or any material is prohibited on site.	4	1	1	1	6

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
	• Burning of waste													
Increased noise levels	Rehabilitation activities	Animals people (Employees and community)	-	6	1	2	3	27	• All equipment must be maintained and kept in good working order to reduce noise. • Provide workers with hearing protection devices (ear plugs) where required. • Use equipment or machinery that complies with the manufacturer's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirement • limit activities that course high noise levels between 6am and 8pm (except for the plant)	2	1	2	2	10

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
									• any tonal alarms that are used during the day must not be audible to any of the receptors • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.					
Non-compliance	Impact of non-compliance with the EMP by the developer	Environmental & socioeconomic aspect	-	8	1	4	5	65	• Undertake an internal EMP audit quarterly and address the non-compliances within the time frame of the approved action plan • Undertake an Independent EMP audit annually and address the non-compliances within the time frame of the approved action plan • Place complaints and input book at the gate to allow recoding of non-	8	1	4	3	39

Impact /	Activity/ Source	Aspect	Nature	Magnitude	Extent	Duration	Probability	Significance before mitigation	Mitigation measures	Magnitude	Extent	Duration	Probability	Significance after mitigation
									compliances observed by I&Aps and address complaints or non-compliances.					

16. SUMMARY OF SPECIALIST REPORTS.

Below is the list all specialist studies that are undertaken as part of the Environmental Impact Assessment Report (EIAR) and Environmental Management Programme. Table 31 below details the recommendations of the specialist studies.

- Air Quality Assessment
- Heritage and Archaeology Assessment
- Blasting and Vibration Assessment
- Terrestrial Impact Assessment
- Wetland Impact Assessment
- Aquatic Impact Assessment
- Hydrogeological Impact Assessment
- Hydrological Impact Assessment
- Noise Impact Assessment
- Community Health Impact Assessment
- Soils, Agriculture Land Use and Land Capability Assessment
- Social Impact Assessment
- Traffic Impact Assessment
- Visual Impact Assessment
- Geotechnical investigation.
- Climate Impact Assessment.
- Hydro-Pedological Assessment.
- Geochemical assessment (leach test)

Table 32:Summary of Specialist Reports Recommendations.

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
Archaeological And Heritage Impact Assessment study	The Report makes the following recommendations: • It is recommended that Amafa KwaZulu Natal and Research Institute endorse the report as having satisfied the requirements of Section 41(2) of Amafa KwaZulu Natal and Research Institute Act of 2018 and 38 (8) of the NHRA requirements. • It is recommended that SAHRA make a decision in terms of Section 38 (4) of the NHRA and Section 41(2) of Amafa KwaZulu Natal and Research Institute Act of 2018 to approve the Mining Right Application on condition that all graves are identified, documented and mapped. • The planners for the mine must provide 100m buffer zone from each burial and historical building recorded in this report. • Documentation of graves located within homesteads must only be done if full permission is granted by the custodian families.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• From a heritage perspective supported by the findings of this study, the Proposed Mining Right Application is supported. However, the Mining Right Application should be approved under observation that the proposed mining does not extend beyond the area considered in this report/affect the identified heritage sites. • should any of the identified historical buildings be on the direct footprint of the proposed mine footprint, a heritage practitioner must be appointed to assess the buildings in detail and apply for demolition permits from Amafa KwaZulu Natal and Research Institute. • Mitigation on graves must not be done without the involvement and consent from the custodian families. • Should chance archaeological materials or human remains be exposed during work to be conducted on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in the mining scheduling while		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations. • Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the Mining Right Application. The Heritage authority may approve the Mining Right Application as planned with special commendations to implement the recommendations made herein.		
Wetland impact Assessment	The Report makes the following recommendations: • Practical measures for dealing with contaminated storm water runoff from waste rock and mining area must be implemented. • Should mining take place at wetland 1 a water use licence must be applied for and approved by DWS. • Due to the sensitivity and the importance of the Mzumbe River a 100 meters' buffer zone has been provided to ensure its protection • Development and implementation of an ecological monitoring programme, including water quality monitoring.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• All the proposed buffer-zones must not be encroached during the mining phase. • The current surface mining area should be amended to ensure that it does not encroach on the wetland because no mining should take place within a wetland area unless authorised by a water use licence; • A 32 meters' buffer zone has been provided for all wetlands on site to ensure adequate protection where no mining structure or infrastructure should take place; and • All the proposed buffer-zones must not be encroached to during the mining phase • The buffer zone also ensures that mining activities does not occur at temporary wetland zones, which are zones that would be wet during wetter seasons, years or floods. Provided that the mitigation measures as suggested can be implemented, then the overall impact of the development components would be of low overall significance.		
Biodiversity Impact Assessment Study	The study area is located within the Grass Biome which is the second largest Biome in southern Africa after the Savanna biome. Biomes can further be	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	divided into vegetation units, with the study area located within *Northern KwaZulu Natal Coastal Belt* and the *KwaZulu-Natal Coastal Belt Thornveld* (occurring along the watercourses on site) but mining structures and infrastructures will only be located within the *Northern KwaZulu Natal Coastal Belt* which according to data sourced from South African National Biodiversity Institute the vegetation unit is listed as Endangered. Although there is a variety of medium sensitive ecological receptor in the area including the surrounding area, the current mining development components are restricted to areas of moderate to low sensitivity. A further characteristic is the low extent of habitat loss and ecological interference resulting from the mining development components. The site is characterised by cultivated area, mining area (current mining permit application area), watercourses and dense closed woody area. No protected plants were recorded during the survey on all the vegetation unit. Based on the impact assessment, the impact on the floral and faunal ecology arising from the mining activities will range from medium significance prior to the implementation of mitigation measures. With mitigation as stipulated in		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	this report effectively implemented, all impacts can be reduced to low. The most important potential impacts that the proposed development could exert on the wetland relate to the (indirect) impact of sedimentation as well as water quality issues. It is important that stormwater from the surrounding development be discharged in such a way as to not affect the hydrological or morphological state of the wetland. Therefore • the current surface mining area should be amended to ensure that it does not encroach on the wetland because no mining should take place within a wetland area unless authorised by a water use licence; • A 32 meters' buffer zone has been provided for all wetlands on site to ensure adequate protection where no mining structure or infrastructure should take place; and • All the proposed buffer-zones must not be encroached to during the mining phase Further, there is a high potential for accelerated erosion and rapid invasion by weeds and alien species, as well as changes species composition and		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	degradation of ecosystem functionality and services along the riparian zone (and downstream). It is assumed however, the provide buffer-zones are to create a 'no go' zone for any vegetation removal or activity allows the wetland enough space to ensure that the habitat integrity is maintained and the human footprint does not encroach on it. The buffer zone also ensures that mining activities does not occur at temporary wetland zones, which are zones that would be wet during wetter seasons, years or floods. Provided that the mitigation measures as suggested can be implemented, then the overall impact of the development components would be of low overall significance.		
Health Impact Assessment	The following are some of the recommendations recommended by Community Health Impact Assessment specialist report compiled by Niara Environmental Consultants • it is recommended that SA Lithium inaugurates relationships with other institutions (e.g., government or NGOs) involved in local and regional healthcare development and social upliftment so as to maximise the benefits of its contribution to the overall health status of the community.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• it is recommended that the air quality management plan be adopted which include implementation of emission controls for the management of significant emission sources. • It is recommended that quantitative data is collected from different potentially-affected communities to inform overall health monitoring program • It is recommended that the Project is allowed to proceed on the assumption that the environmental, social and health management commitments are adhered to.		
Social Impact Assessment	The Report makes the following recommendations: • During construction, the Project will require highly technical capital goods and services, and it will procure these through contracts lasting several months to several years. Although most of the Mine's Project specific products will need to be sourced nationally and / or internationally, requirements such as civil engineering services, food supply, maintenance services for nontechnical aspects, security services, buildings and facilities maintenance, general vehicle maintenance,	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	employee transport, and land management are able to be procured from some businesses within the primary area and secondary areas. • A social management plan and social monitoring plan must be developed to manage and monitor the implementation of these measures and recommend corrective measures, where necessary.		
Noise Impact Assessment	The Report makes the following recommendations: • Bi-annual (twice a year, every 6 months) environmental noise measurements are to be conducted at receptors where potential impacts have been identified in this report, and assessed for compliance. Positions must include measurements at the processing plant laydown boundaries. Should the biannual measurements indicate that there is no negative impact at the receptor locations AND no noise complaints are received after 2 years from full plant and mine operation commencement, the noise survey frequency may be reduced to annual, continuing for the life of the project. No measurements are to be conducted if receptors are relocated. • Measurements should also be conducted prior to commencement of each phase to confirm baseline findings for the purposes of assessment. Measurements and reporting should be conducted during all phases	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	including construction, operational and closure phases. Bi-annual recommended for the construction phase, and annual for the closure phase. • In subsequent assessments, the methodology set out by SANS10103:2008 must be used. Compliance with the Noise Control Regulations should also be met (I.e. Increase of less than +7dBA above district rating level). • Measurements should be conducted in terms of equivalent values (impulse), with statistical and octave band data useful for further investigation. Meteorological conditions should be noted and logged. • Where feasible longer term (24 hours or longer) measurements should be conducted. • Where feasible, engineering or process testing should be conducted during environmental measurements to identify any noisy equipment requiring further abatement, specifically during commissioning. • A noise complaint and community relations channel must be setup to assist complaints to be received and attended to in a timely manner by		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	the contractor for construction/ closure phase, and by the Client for operational phase. • Where noise complaints are received, a survey of the specific noise in question must be measured, assessed and reported at the location of the alleged nuisance/ disturbance. Where non-compliance is identified, the cause of the extraneous noise source/s must be mitigated appropriately to ensure compliance to SANS10103:2008 and National NCR GN R154.		
Geohydrological Investigation	The Report makes the following recommendations: • An appropriate liner is recommended for all water retaining infrastructure, • Ensure separation of clean and dirty water • Recycle, reuse and or evaporate contaminated water, • No construction of any water management measures will be undertaken with potentially hazardous material, • All dams will be constructed to comply with the relevant DWS requirements to minimize the seepage of poor-quality leachate,	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• Ensure clean-up of hydrocarbon spills from machinery is done immediately, and contaminated soils disposed of to a permitted site.		
Traffic Impact Assessment	The Report makes the following recommendations: • For safety reasons, Intersection 5 between R102 and Unnamed Road located at 30°36'54.53" S 30°32'37.23" E shall require the services of geometric engineering to improve the turning lanes to be at least 90m. This is because of the poor site distances that characterise the intersection. • The pavement condition of the surface roads that shall lead to the mine are deteriorating and the introduction of heavy vehicles to the mine shall cause further disintegration of pavement layers. This road shall have to be assessed by a pavement engineer and be improved. • All proposed road upgrades and internal mine roads and amendments will be designed by a professional engineer and submitted for official approval prior to implementation. • Although the intersections operate at an acceptable level of service it is recommended that the mine construct internal service roads with	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	adequate geometric considerations for the movement of tipper trucks, tankers, low bed carriers and flatbed trucks. This is to ensure that swept paths of these trucks is adequate and therefore guaranteeing safe movement. Any unpaved roads within the development must be wet sprayed to diminish dust pollution.		
Visual Impact Assessment	The Report makes the following recommendations: • The proposed project will be contrasting to the existing land use and will therefore not be absorbed by the current residential activities. The proposed project will be noticeable from sensitive viewing points. • Mitigation measures will be viable during the first phases of construction but as the project footprint and the height of the structures increase, the mitigation measures will be less effective. Good housekeeping will be essential as this will mitigate visual impacts such as dust. Unfortunately, the mitigation measure during the operational phase will not be viable since the viewers are scattered throughout the site and the proposed project is located on the mountain.	**X**	Table 28,29 and 30 (Impact assessment tables)

<table>
<tr><th>Specialist Study</th><th>Recommendations of Specialist Reports</th><th>Specialist recommendations have been included in the EIA Report</th><th>Applicable section of report where specialist recommendations have been Included</th></tr>
<tr><td></td><td>A summary of the study area's visual resource values is tabulated in Table below.

<table>
<tr><th>Value</th><th>Description</th><th>Visual Resource</th></tr>
<tr><td>High</td><td>This landscape type is considered to have a high value because it is a:
Distinct landscape that exhibits a very positive character with valued features that combine to give the experience of unity, richness and harmony. It is a landscape that may be of particular importance to conserve and which has a strong sense of place.

<u>Sensitivity:</u>
It is sensitive to change in general and will be detrimentally affected if change is inappropriately dealt with.</td><td>Rivers such as:
• Kwamalukaka River and tributaries
• Mzumbe River and tributaries
• Mountains Ocean</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

Specialist Study	Recommendations of Specialist Reports			Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	Moderate	This landscape type is considered to have a *moderate* value because it is a: Common landscape that exhibits some positive character, but which has evidence of alteration / degradation/ erosion of features resulting in areas of more mixed character. **Sensitivity:** It is potentially sensitive to change in general and change may be detrimental if inappropriately dealt with	Agricultural fields (Sugarcane fields) Rural villages such as: • Magog • Fairview • Silwane • Velumemeze • Bendigo • Mandla • Gwala-Gwala Coastal towns such as: • Hibberdene • Umzumbe Beach • Pumula		

<table>
<tr><th>Specialist Study</th><th>Recommendations of Specialist Reports</th><th>Specialist recommendations have been included in the EIA Report</th><th>Applicable section of report where specialist recommendations have been Included</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td></td><td>• Sunview Port
• South Port.</td></tr>
<tr><td>Low</td><td>• This landscape type is considered to have a low value because it is a:
• Minimal landscape generally negative in character with few, if any, valued features.

Sensitivity:
It is not sensitive to change in general and change</td><td>Industrial/ Infrastructure
• Jolly Pack
• Roads</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>Blast Impact Assessment (Appendix 18)</td><td>• Blast Designs
Blast designs can be reviewed prior to first blast planned and done. Specific attention must be given to the use of electronic initiation rather than conventional timing systems. This will allow for single blast hole firing instead</td><td>X</td><td>Table 29 (Impact assessment table)</td></tr>
</table>

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	of multiple blast holes. Single blast hole firing will provide single hole firing – thus less charge mass per delay and less influence. • **Test Blasting** It is always good to conduct a first test blast to confirm levels and ground vibration and air blast. It is recommended that such a blast be done, and detail monitoring done and used to help define blasting operations going forward. This test blast can be based on the existing design and only after this blast it may be necessary to define if changes are required or not. • **Stemming length** The current proposed stemming lengths used provides for some control on fly rock. Consideration can be given to increase this length for better control. Specific designs where distances between blast and point of concern are known should be considered. Recommended stemming length should range between 20 and 30 times the blast hole diameter. In cases for better fly control this should range between 30 and 34 times the blast holes diameter. Increased stemming lengths will also contribute to more acceptable air blast levels. • **Safe blasting distance and evacuation**		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	Calculated minimum safe distance is 439 m. The final blast designs that may be used will determine the final decision on safe distance to evacuate people and animals. This distance may be greater pending the final code of practice of the mine and responsible blaster's decision on safe distance. The blaster has a legal obligation concerning the safe distance and he needs to determine this distance. • **Road management** ✓ The N2 National Road is at closest approximate distance of 3159 m. The D297 road is at closest distance of 444 m and the P198 road at 585 m. No specific management measures will be required for the N2 and the D297. ✓ The D150 district road runs through the pit area and will require rerouting. Pending the rerouting a stop and go process may be required if the still within the Insafe boundary for blasting. ✓ There are other gravel roads in the area. There may however be people and animals on these routes and will require careful planning to maintain safe blasting radius. It will be required that clearance distances be set, and road travel managed during blasting operations.		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• **Photographic Inspections** The option of photographic survey of all structures up to 1500 m from the pit area is recommended. The mine will be operating for a significant number of years. This will give advantage on any negotiations with regards to complaints from neighbours on structural issues due to blasting. This process can however only succeed if done in conjunction with a proper monitoring program. It is expected that ground vibration levels will be significantly less than proposed limits at 1500 m, but this process will ensure record of the pre-blasting status of the nearest structures to the pit area. At 1500 m the expected level of ground vibration will be perceptible. **Recommended ground vibration and air blast levels** The ground vibration and air blast levels limits recommended for blasting operations in this area are provided in Table 27 of the Blast Impact Assessment report dated 08 December 2023 compiled by Blast Management and Consulting. • **Blasting times**		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	✓ A further consideration of blasting times is when weather conditions could influence the effects yielded by blasting operations. It is recommended not to blast too early in the morning when it is still cool or when there is a possibility of atmospheric inversion or too late in the afternoon in winter. Do not blast in fog. Do not blast in the dark. Refrain from blasting when wind is blowing strongly in the direction of an outside receptor. Do not blast with low overcast clouds. These 'do nots' stem from the influence that weather has on air blast. The energy of air blast cannot be increased but it is distributed differently and therefore is difficult to mitigate. ✓ It is recommended that a standard blasting time is fixed and blasting notice boards setup at various routes around the project area that will inform the community of blasting dates and times. • **Third party monitoring** Third party consultation and monitoring should be considered for all ground vibration and air blast monitoring work. This will bring about unbiased evaluation of levels and influence from an independent group. Monitoring could be done using permanent installed stations. Audit functions may also		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	be conducted to assist the mine in maintaining a high level of performance with regards to blast results and the effects related to blasting operations. Please refer to section 21 regarding proposed monitoring positions. • **Video monitoring of each blast** Video of each blast will help to define if fly rock occurred and origin of fly rock. Immediate mitigation measure can then be applied if necessary. The video will also be a record of blast conditions. • **Knowledge Gaps** The data provided from client and information gathered was sufficient to conduct this study. Surface surroundings change continuously, and this should be considered prior to initial blasting operations considered. This report may need to be reviewed and updated if necessary. This report is based on data provided and internationally accepted methods and methodology used for calculations and predictions. • **Project Result** The successful resolving of these concerns will allow that the project can be executed successfully with proper management and control on the aspects of ground vibration, air blast and fly rock.		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
Hydro-Pedological Assessment **(Appendix 15)**	The following recommendations are proposed by the specialist in order to mitigate the impacts on the receiving environment; • The watercourses must be protected against erosion arising from the stormwater runoff from the associated infrastructural areas. In this regard, runoff should be attenuated before discharging into the valley, thus recharging the valley in an ecologically appropriate manner. • All hazardous wastes such as oil, diesel, grease etc must be stored in a designated area, to avoid leakages that might contaminate the soil and water resources. • The mine must impose strict erosion control measures to limit loss of soil and sedimentation of the wetlands, valleys and dams within and adjacent to the proposed project. • A geohydrological study should be done on the proposed mining site, this will aid in understanding the behaviour of water resources within the site in terms of monitoring of water table level, water contamination and delineation of wetlands. • All surface development footprint areas should remain as small as possible and disturbance of soil profiles must be avoided.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• After completion of the construction phase, areas of disturbance, particularly adjacent to the watercourse should be monitored after an erosive rainfall until the natural vegetation has well established. • The contractor must make sure that all infrastructures are not erected on or next to the wetlands. • Soil contamination assessment must be undertaken during the operational phase, this will assist in determining if the natural state of soil is not impacted by the mining activities.		
Geotechnical Investigations	The following foundation options as defined by the GFHS-2 are recommended for single storey masonry house structures to be erected at Zone 1: • Modified normal. • Compaction of in-situ soils below individual footings • Deep strip foundations • Soil raft	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	The following foundation options as defined by the GFHS-2 are recommended for single storey masonry house structures to be erected at Zone 2: • Stiffened strip footings • Stiffened or cellular raft • Compaction of in-situ soils below individual footings • Deep strip foundations • Piled or pier foundations • Soil raft		
Air Quality Impact Assessment	To ensure the lowest possible impact on AQSRs and the environment, it is recommended that the air quality management plan as set out in this report be adopted. • The implementation of emission controls for the management of significant emission sources; and Air quality monitoring: ✓ The extension of continuous dust-fall monitoring as part of the project's air quality management plan. Monitoring should be undertaken	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	throughout the life of the mine to provide air quality trends and indicate compliance with NAAQSs. ✓ It is recommended that SA Lithium collaborate with other mines/industries in the region to install an ambient gravimetric PM10/PM2.5 monitor in the closest AQSRs. This will provide adequate data on cumulative PM10 and PM2.5 concentrations from the proposed project and other mines/industries in the region.		
Aquatic Biodiversity Specialist Assessment	Authorisation of the Project in relation to potential impacts on estuarine ecosystems is recommended provided that the mitigation measures recommended in this report are followed. This recommendation is based on the following considerations: • **Impacts.** The residual significance of the potential impacts on aquatic ecosystems was minor to negligible; • **Reversibility.** Estuaries are dynamic and ecological functions that may be impacted by the Project could, in most instances, be restored. An exception would be the failure of the TSF, which could have irreversible impacts on Intshambili Estuary. This highlights the importance that the construction and operation of the TSF adhere strictly to the Global	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	Industry Standards on Tailings Management (Global Tailings Review 2020). • **Loss of Irreplaceable Resources.** The Project is unlikely to cause the loss of any irreplaceable estuarine resources; • **Estuarine Habitats.** Current land uses in the catchment have already affected estuarine habitats, and the Project is not expected to have significant further impacts on estuarine habitats; • **Present Ecological State.** The Project is not expected to alter the Present Ecological State of the two potentially impacted estuaries; • **Threatened Invertebrates**. One species of nationally threatened invertebrate was confirmed in Mzumbe Estuary in March 2023, namely the estuarine limpet Septaria borbonica. This species has a narrow habitat preference for lower estuarine zones. In Mzumbe Estuary it was recorded only on the emergent reed Schoenoplectus scirpoides, which was restricted to a small area on the margins of the channel. The presence of this species does not constitute a red flag for the Project, but it highlights the importance of developing and implementing detailed plans for 1)		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	Stormwater Management; 2) Mine Dewatering; and 3) Social Development. • **Threatened Fish.** One species of threatened fish was confirmed in both estuaries in February and March 2023, namely Oreochromis mossambicus. This species is threated by hybridisation with the alien Nile tilapia and is unlikely to be negatively affected by the Project; • **Unique or Important Ecological Features.** The Project is unlikely to significantly affect any unique or important estuarine features; • **Ecological Connectivity.** The Project will not affect migration corridors for estuarine biota; • **Hydrological Functions.** Mine dewatering could affect flow patterns in Mzumbe Estuary, but these can be managed; • **Sediment Transport.** The Project is certain to have increased sediment transport during the construction period, but this can be managed by implementing a Stormwater Management Plan; • **Water Quality.** Water quality deterioration associated with the Project is a potential issue of concern, but this can be managed by implementing the recommended mitigation measures;		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• **Key Ecosystem Services.** The Project is not expected to impact negatively on estuarine ecosystem services.		
Hydrology Impact Assessment	In order to mitigate against the identified impacts during the construction and active phase of the project, the following measures are proposed: • To limit soil erosion, construction activities (more specifically clearing of land) should be limited to the dry season (May to October) as far as possible. • During the construction phase, upstream and downstream berms should be implemented for any area where the vegetation has been stripped or there are open ground areas. Upstream diversions will ensure limited surface flows through exposed areas. Downstream berms will ensure that sediments eroded from within the exposed site will be trapped, therefore reducing the impact to the downstream receiving environment. It is recommended that the berms are constructed out of a non-erodible material, such as sandbags with plastic liners. • Materials excavated during the construction phase should be deposited in areas outside of drainage lines and stormwater channels. This will ensure	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	minimal contact between concentrated stormwater runoff and the excavated materials. • Machinery used during the construction of the waste dump footprint and opencast pit surface should be regularly (at least daily) checked for oil leaks. During periods where the machinery is not in use, drip trays should be placed under the machinery to contain any spillages. • Water downstream of the waste dump footprint and associated paddocks and opencast pit surface sites should be constantly monitored to ensure that if spillages occur, appropriate remediation measures may be implemented. • Clearing of vegetation for construction purposes must be undertaken in accordance with a method statement. The method statement must include the method of clearing, recovery of and disposal of vegetation		
Climate Change Assessment	The Climate Change Assessment made the following recommendations:- • The plan to address climate change should include appropriate climate change adaptation actions focusing on health and social resilience building. It should also consider land rehabilitation as land plays a critical role in post mine life sustainability.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• Pro-active planning for land restoration and rehabilitation, in the context of climate change is crucial to ensure the future integration of land into the existing spatial context and supporting sustainable development trajectories. • Changing climatic parameters such as droughts and flash floods could constrain the land rehabilitation process. Due to this, it is recommended that the rehabilitation and mine closure plans clearly address climate change risks and mitigation measures to optimise land for land uses that would be suggested in post closure public meetings. • plant as many trees as possible to offset the carbon footprint. Set an annual target and implement it. • investigate and implement /use renewable energy to reduce the car footprint		
Soils, Land Capability, And Agricultural Specialist Assessment	The sensitivity analysis has identified the project area to have a Medium to Very-High sensitivity and as such an Agro-ecosystem impact assessment is required. The desktop results as well as the field verification and detailed soils assessment have determined that the agricultural potential is rated as	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	Medium to High based on the climatic conditions as well as the soils identified on site. The following supports the above-mentioned findings: **Desktop Results**; • DEA screening assessment determined the agricultural sensitivity to be Medium to Very-High; • The project is within a crop field boundary; • The desktop land capability rated the project area as Moderate to Moderate-High; • The climate capability was determined to be High; • The desktop soil capability rated the project area as Moderate-High to High; and • The desktop grazing capability rated the project area as ranged between 3.5ha and 5ha/LSU. **Site Assessment Results**;		

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• Land capability was determined as grazing to light cultivation; • Land potential was determined to be L2 (high potential) to L4 (moderate potential); and • Land use showed commercial sugarcane production in large portions of the project area.		
Geochemical assessment	The geochemical assessment/ leach test recommendations are summarised below. • The overburden material has low risk acid generating potential • The waste rock comprise mainly of the massive gneiss (low risk acid generation potential) with a small percentage of pyrite mineralised waste rock (9 to11%). The presence of silicate minerals may offer some buffering of acid generation. • Ore material is of low risk acid generation potential with aluminium and iron in a form of colloidal oxyhydroxides. • A class D engineered base is recommended for the WRD.	**X**	Table 28,29 and 30 (Impact assessment tables)

Specialist Study	Recommendations of Specialist Reports	Specialist recommendations have been included in the EIA Report	Applicable section of report where specialist recommendations have been Included
	• The waste classification is type 4 with the class D engineered base and a design that encourage runoff.		

17. ENVIRONMENTAL IMPACT STATEMENT

17.1. Summary of the key findings of the environmental impact assessment.

Environmental impacts associated with mining activities are expected to be of high to medium and medium to low significance. Mitigation measures have been recommended by the EAP and specialists in order to eliminate and/or reduce environmental impacts. These mitigation measures and monitoring programmes have been included as commitments in the Environmental Management Programme.

The Environmental Management Programme aims to present management measures that will eliminate, offset or reduce adverse environmental impacts, as well as to provide framework for environmental monitoring. The purpose of the Environmental Management Programme is to ensure that negative environmental impacts of the proposed project are effectively managed within acceptable limits and that the positive impacts are enhanced.
Table 32 and 33 summarise the impacts and their significate before and after mitigation implementation.

Table 33:Construction Phase summary of the Potential Impacts

Impact	Aspect	Significance before mitigation	Significance after mitigation
Change in land use to mining	Topography	Medium	Low
Climate change impact (cumulative impact)	Air Quality & Climate Change	High	Medium
Loss of agricultural resources and infrastructure (land capability and potential)	Soil	Medium	High
Loss of soil resource as the agricultural and environmental resource	Soil	Medium	Medium

Impact	Aspect	Significance before mitigation	Significance after mitigation
Noise generation and Increased noise levels	Noise	Low	Low
Natural forest clearance	Flora	High	Medium
Alien invasive establishment	Flora	Medium	Low
Loss of Faunal Life	Fauna	Medium	Low
Potential for accidents and injuries to workers	Health and Safety	Medium	Low
Groundwater pollution	Groundwater	Medium	Low
Contamination from dirty runoff.	Surface water	Medium	Low
Wetland destruction	Wetland and Seeps	Medium	Low
Loss of habitat and wetland ecological structure Impact on the hydrological functioning of the wetland	Wetland	Medium	Low
Impact on Heritage Resources	Heritage Resources	Low	Low
Increased Traffic and Traffic Disruptions	Traffic	Low	Low
Poor Visibility due to dust creation	Visual Impact	Medium	Low
Lighting at night	People and animals	Medium	Low
Littering on site.	Waste management	Medium	Low
Job Creation	Socio-economic Impact	High	High

Impact	Aspect	Significance before mitigation	Significance after mitigation
Increased Social Pathologies Linked to Influx of Workers and Job Seekers	Socio-economic Impact	Medium	Medium

Table 34: Operational Phase summary of potential impacts

Impact	Aspect	Significance before mitigation	Significance after mitigation
topographical change	Geology	High	High
Modified topography of the site	Topography	High	High
Noise generation and Increased noise levels	Noise	High	Low
Direct vegetation and habitat destruction	natural forest and fauna	High	Medium
Direct and indirect impacts on sensitive ecosystem	CBA	High	Medium
Direct impacts on flora species	Flora	Medium	Low
Disturbance or degradation of the natural soil profile in the area.	Soil and Land capability	High	Low
Potential leaching from the waste rock dump and leaching from waste bins can lead to soil and water contamination	Soil, land capability and water contamination	Medium	Low
Soil Contamination	Soil	Medium	Low
Potential for accidents and injuries to the public and workers.	Health and Safety	Medium	Low
Material and equipment stolen or vandalized.	Security	Medium	Low
Increase veld fires potentially	Fire control	Low	Low
• Loss of topsoil as a resource	Agriculture	High	Medium

Impact	Aspect	Significance before mitigation	Significance after mitigation
• Loss of Agricultural Resources and Infrastructure			
Groundwater Pollution	Ground water	Medium	Low
Surface Water Pollution	Surface water	Medium	Low
Loss of habitat and wetland ecological structure	Wetland	Medium	Low
Destruction of heritage resources	Heritage Resources	Medium	Low
Air Pollution	Air quality and people	Medium	Low
The greenhouse and other noxious gas emissions	Air Quality & Climate Change	High	Medium
Generation of waste	Waste Management	Medium	Low
Water Pollution	Waste Management	Medium	Low
Negative impact on aesthetic quality of the area	Visual Impact	Medium	Low
Change to aesthetics of the landscape	Visual Impacts	High	High
Added traffic on the road network	Traffic	Medium	Low
Vibration Damage to village houses and structure.	Ground Vibration	High	Low
Air Blast damage on village houses and Structures	Air blast	High	Low
• Fly Rock damage to village houses • Fly Rock and on D150	Fly rock	High	Low
Employment	Socio-economic Aspect	High	High
Increase in population size	Socio-Economic	High	Medium

Impact	Aspect	Significance before mitigation	Significance after mitigation
Bad lifestyle habits	Human Health	Medium	Medium

17.2. Final Site Map

Provide a map at an appropriate scale which superimposes the proposed overall activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffer. Attach as Appendix

The composite final site map is reflected below as **figure 41**. The map shows the location of all infrastructure and activities superimposed over a layout of the drainage lines, the wetland, traffic routes, aquatic system, vegetation and other aspects of the biophysical environment. The map summarise the impacts of the proposed project on the bio-physical environment.

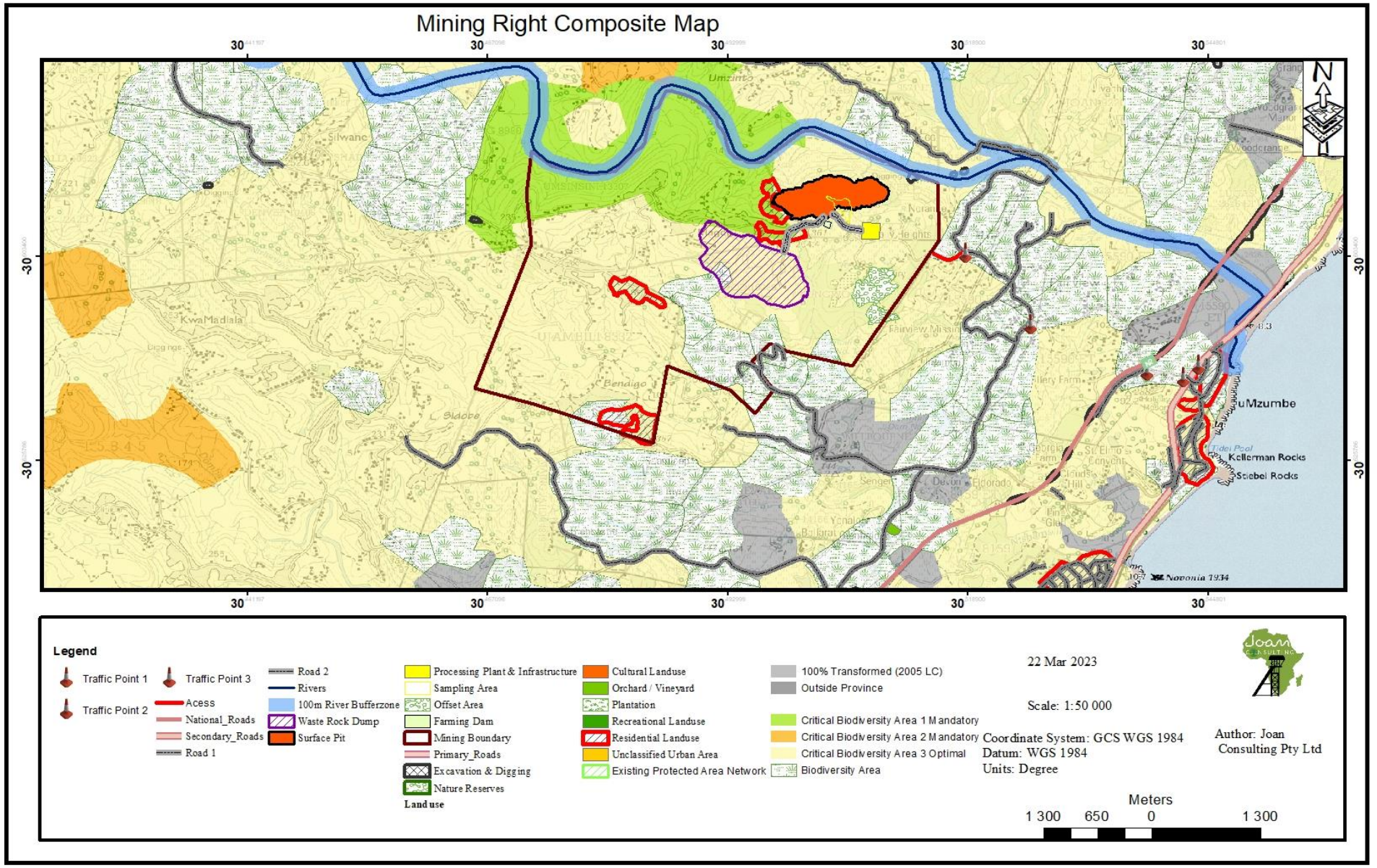

Figure 42: Project Composite map

21. PROPOSED IMPACT MANAGEMENT OBJECTIVES AND THE IMPACT MANAGEMENT OUTCOMES FOR INCLUSION IN THE EMPR;

Based on the assessment and where applicable the recommendations from specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation.

The purpose of the EMPr is to provide relevant management measures that will help avoid or limit any adverse impacts that may result from the mining operations and ensure that all resultant impacts meet acceptable standards, both as a legal and social responsibility to the receiving environment and its surroundings.

Another objective of the EMP is to also address comments provided by stakeholders or I&AP regarding the development, establish a method of monitoring and auditing environmental management practices during all phases of the activity and ensure that safety recommendations are complied with.

22. FINAL PROPOSED ALTERNATIVES.

(Provide an explanation for the final layout of the infrastructure and activities on the overall site as shown on the final site map together with the reasons why they are the final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment)

below is the motivation for the final layout . The alternatives were discussed in details under Item 6.

a) The final layout plan is preferred because it is more sustainable compared to another layout alternative. Thus, the bio-physical aspects protection and conservation consideration level is higher than that of the other alternatives.
b) The sustainability referred to above is based on the fact that the final layout has a smaller footprint which translate to less impacts while the same footprint use is to be maximised to limit the overall impact of the activity ‘s life of mine.

23. ASPECTS FOR INCLUSION AS CONDITIONS OF AUTHORISATION.

Any aspects which have not formed part of the EMPr that must be made conditions of the Environmental Authorisation

- Operations must only be undertaken within the approved footprint
- The extension of the mining footprint or activity beyond the current footprint must be assessed by the independent EAP and approved by the Competent Authority before commencement on the extension site.
- Disturbed areas must be rehabilitated to a state that matches or blends with the surrounding area.
- The rehabilitation plan must be considered as the first draft and a living document. All measures on the report must be implemented through the life of the operation
- A Water Use License must be granted before undertaking the listed water use activities

24. DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE.

(Which relate to the assessment and mitigation measures proposed)

The compilation of this report assumed that:-

- The description of the proposed project, provided by the applicant is sufficient for providing authorities with right information for understanding the proposed project.
- All information provided to the EAP was correct at the time it was provided
- The scope of this investigation is limited to impacts on the preferred site /footprint.
- That all information provided by interested and affected parties during the public consultation period is correct.

It is also noted that the EAP and the specialists reserves the right to update any part of the report should any new information that will have material impact on the recommendation arise.

25. REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

25.1. Reasons why the activity should be authorized or not.

It is the opinion of the Environmental Assessment Practitioner (EAP) that the proposed mining activities should be authorised based on the following findings:

a) The benefit of the mineral of interest

In a quest to curb the global crisis of climate change (global warming), there is a need to move from fossil fuel energy production to greener and renewal sources such as Lithium batteries. Lithium is primarily used for energy generation in a form of Lithium batteries and has no carbon release. This makes Lithium (as the main mineral of interest) one of the few minerals which is used to benefit the environment.

b) Sustainability

It can prove futile or even more detrimental if the only reason for the authorisation is the benefit of the mineral of interest post mining with no consideration to the impact of the process of obtaining the mineral on the environment.

The Environmental impact assessment has identified negative and positive impacts of the mining activity and provided the management measures. The impact significance rank from high to medium before mitigation measures, and medium to low after mitigation measures are implemented. After implementing the alternatives, the extent covered by natural forest patches that will be directly impacted is less than 15 hectares out of the 1233ha of the mining boundary and almost 200ha of the mine footprint

The above was considered in light of the vast socio-economic benefits the proposed project will bring to the local community and the economy of the country. These benefits range from long term jobs (creation), community infrastructure upgrade through the implementation of the Social and Labour Plan, community benefits from Corporate Social Investments (which the community is already enjoying under the prospecting program), benefits to local business people in a form of contracts to supply goods and provides services such as transport, mining equipment, catering and other mine support services.

25.2. Conditions that must be included in the authorisation

The following conditions must be included in the Environmental Authorisation

- Environmental audits must be quarterly and annually to ensure compliance with the EA and EMP;
- financial provision for the rehabilitation of the disturbed areas must update it annually and the shortfall must be provided for .
- mining should be undertaken within the approved footprint. the footprint must be clearly marked and fenced.
- place no go-area notices at the edge of wetland and all areas which are not demarcated for mining.
- undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees and climate change.
- implement storm water management plan from the project onset.

26. REHABILITATION REQUIREMENTS

The Rehabilitation Plan Report to rehabilitate the mining right area after decommissioning phase of the project is attached as Appendix 3 of this report

27. PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

The Environmental Authorisation is required for 20 years.

28. UNDERTAKING

Confirm that the undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Basic assessment report and the Environmental Management Programme report.

The undertaking required to meet the requirements of this section is provided at the end of the EMPr and is applicable to both the Environmental Impact Assessment report and the Environmental Management Programme report.

29. FINANCIAL PROVISION

State the amount that is required to both manage and rehabilitate the environment in respect of rehabilitation.

The amount that is required to both manage and rehabilitate the environment in respect of rehabilitation is calculated using the Quantum of financials 2023 is R82 855 727,59 (Eighty-Two Million, Eight Hundred and Fifty-Five Thousand Seven hundred and Twenty Seven Rand and Fifty-Nine Cents). See Figure 42.

29.1. Explain how the aforesaid amount was derived.

The amount was derived from using the Department of Mineral Resources and Energy (DMRE) quantum of financial provision table with updated rates. See Figure 42..

29.2. Confirm that this amount can be provided for from operating expenditure.

(Confirm that the amount, is anticipated to be an operating cost and is provided for as such in the Mining work programme).

The amount has been provided for in the MWP and will be provided in a form a guarantee to the Competent Authority. .

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

30.1. Deviations with motivation

(Provide a list of activities in respect of which the approved scoping report was deviated from, the reference in this report identifying where the deviation was made, and a brief description of the extent of the deviation).

The following are the deviations from the scoping report and plan of study:-

a) The Mining plan has been modified by:-
   - reducing the footprint of the WRD & pit to ensure minimal impacts
   - changing the location of the plant laydown area to place the WRD on the footprint
   - The tailings dam has been removed following the decision to switch to a more environmentally sustainable metallurgical process

b) The metallurgical process has been modified in order to eliminate the slurry type of tailings and ensure more environmental-friendly process.

c) Additional specialist over and above the ones recommended in the screening tool were undertaken to get more understanding on different environmental aspects.

31. OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

Compliance with the provisions of sections 24(4)(a) and (b) read with section 24 (3) (a) and (7) of the National Environmental Management Act (Act 107 of 1998).: -

31.1. Impact on the socio-economic conditions of any directly affected persons.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The proposed mining activities will directly impact on the socio-economic conditions of the land owners in whose land the mining activities will be undertaken. SA Lithium is busy engaging the land owners concerned with regarding to buying the land concerned to ensure proper and acceptance compensation.

32. IMPACT ON ANY NATIONAL ESTATE REFERRED TO IN SECTION 3(2) OF THE NATIONAL HERITAGE RESOURCES ACT.

(Provide the results of Investigation, assessment, and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) with the exception of the national estate contemplated in section 3(2)(*i*)(vi) and (vii) of that Act, attach the investigation report as **Appendix 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

Desktop research revealed that the project area is rich in LIA archaeological sites and historical sites, however, the study recorded scatters of potsherd mainly within cane plantation. According to the archaeological studies report, there are no obvious 'Fatal Flaws' or 'No-Go' areas. However, the potential for chance finds, remains and the applicant and contractors are urged to be diligent and observant during construction and operational phase. The chance find reporting and procedure is detailed in the Archaeological specialist studies.

33. OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4)(A) AND (B) OF THE ACT.

(The EAP managing the application must provide the competent authority with detailed, written proof of an investigation as required by section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as **Appendix 4)**.

The alternatives for the activity, location & methods of sub activities and the option of not implementing the activity were assed and detailed under Item 7 of this report.

PART B

ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

34. DETAILS OF THE EAP,

(Confirm that the requirement for the provision of the details and expertise of the EAP are already included in PART A, section 1(a) herein as required).

It is confirmed that the requirements for the provision of the details and expertise of the EAP are already included in PART A, section 1.

35. DESCRIPTION OF THE ASPECTS OF THE ACTIVITY

(Confirm that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A, section (1)(h) herein as required).

It is confirmed that the requirement to describe the aspects of the activity that are covered by the draft environmental management programme is already included in PART A.

36. COMPOSITE MAP

(Provide a map **(Attached as an Appendix**) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers)

The Composite map of the proposed development is presented as **Figure 43**

37. DESCRIPTION OF IMPACT MANAGEMENT OBJECTIVES INCLUDING MANAGEMENT STATEMENTS

37.1. Determination of closure objectives.

(Ensure that the closure objectives are informed by the type of environment described in 2.4 herein)

The closure-related objectives are as follows:

- To ensure that all areas that are impacted by mining activities are physically stable and non-eroding post closure.
- To rip, shape, and vegetate the disturbed areas to blend with the surrounding.
- To limit the possible adverse environmental consequences arising from the mining post closure and ensure that environmental functionality, where relevant, is reinstated;
- To ensure that the rehabilitated site is free-draining and run-off is routed to natural catchments, to sustain catchment yield;
- To eliminate potential latent safety threats to humans and animals through proper closure of the pits;
- To re-instate pre-existing land uses/capabilities over the affected portions of the mining sites where possible.

37.2. The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

The **table 34** overleaf indicates the manner in which any ecological degradation will be mitigated or managed.

Table 35:Management of Ecological Degradation

Impact	Mitigation measures
Change in land Use from agriculture to mining	• Demarcate construction footprint and limit activities to the demarcated footprint. • Limit all impacts only to the approved development footprint and the mining right area if necessary.
Air Pollution	• Suppress dust with water or any environmentally friendly suppressant. • Monitor dust fallout • Vegetate soil stockpiles, berms and all exposed areas where possible • Set and ensure compliance with the speed limit on site. • Ensure that gravel roads are maintained • Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards
Greenhouse gases emissions (cumulative impact)	• Plant trees to serve as the carbon sink and reduce carbon levels from the atmosphere • Investigate and use greener energy options such as solar to reduce electricity consumption • Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards

Soil contamination	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent
	  ○ accidental spillage &,
	  ○ spillage caused by flooding or storm damage.

Impact	Mitigation measures
	• The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Provide skip bins for construction solid waste. • Provide normal bins for litre and locate them in strategic location to reduce littering potential. • Train the construction team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste associated with construction phase activities shall be temporarily stored in proper containers and will be disposed of at a relevant registered site. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite
Soil Erosion	• Demarcate construction footprint and limit activities to the demarcated footprint. • Stockpile topsoil on a flats surface and away from drainage lines to prevent soil erosion. • At the end of construction rehabilitate the disturbed areas that will not be paved and use the topsoil to aid regrowth. • Grade and landscape the construction site to reduce the runoff speed (Terracing). • Encourage vegetation growth on topsoil stockpiles and berms to reduce the erosion • Keep as much original land cover as possible • Gravel roads must be graded to aid proper drainage

Impact	Mitigation measures
• Reduced land capability	• The construction or erection of infrastructures must be limited to the boundary of the demarcated footprint • When removing soil and overburden for stock piling, the topsoil, the subsoil and the waste rock and be stockpiled separately.
• Loss of topsoil as an environmental and agricultural resource	• Topsoil and where possible and feasible subsoil must be removed and stockpiled in all areas where the infrastructure will be built (waste rock dump, plant laydown and the pit areas), • Where necessary or if there is no safe/flat area to stockpile the topsoil, give is to the neighbouring farmers (to use for their crop farming) or use the soil at the off-set site to aid vegetation growth. • erosion berms must be constructed to minimize any further erosion from taking place. • 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 (only after alien vegetation has been removed);
Noise generation and Increased noise levels	• All adjacent landowners must be notified about the project prior to commencement of construction • All equipment to be adequately maintained and kept in good working order to reduce noise. • Provide workers with hearing protection (ear plugs). • Use equipment or machinery that complies with the manufacture's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirements • limit activities that course high noise levels between 6am and 8pm (except for the plant) • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit

Impact	Mitigation measures
	• air pressure discharge valves must have attenuators. • relocate the adjacent homestead to at least 500m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.
Vegetation and habitat destruction	• Remove vegetation only in the designated areas • Prioritise low-sensitivity areas (disturbed areas) rather than natural areas where feasible. • Use existing roads and tracks where feasible. • No open fires must be allowed on site such as for cooking. • Prohibit harvesting of indigenous trees for firewood and indigenous flora in general. • Limit the development footprint of the proposed development as far as possible, • undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees. • Use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas
Vegetation and habitat destruction	• Phased mining and vegetation clearance is preferred (dust, instead of removing vegetation on the whole footprint at once, remove only where it is necessary for the extent of mining to be done within a specific period. this will allow time for the fauna to migrate. • undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees.
Alien invasive	• Compile and implement an alien invasive species management plan and implement it.

Impact	Mitigation measures
establishment	
Loss of Faunal Life	• Limit development footprint to the approved demarcated plan. • Use semi-permanent means /material to demarcate or provide boundaries to construction areas to control the movement of personnel and vehicles. • No poaching is allowed. Non-compliance should carry a heavy fine. • Walk the area marked for vegetation clearance and soil removal a few hours before to chase small animals away to reduce the number of animal fatalities. • Do not kill snakes except when there is an immediate danger posed. • undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees.
Potential for accidents and injuries to workers	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) • All employees must be given adequate Personal Protective Equipment (PPE) • Environmental and safety awareness training (newsletters or facilitated training) must be undertaken quarterly
Groundwater pollution	• Accidental spillage must be minimised and contained. • Vehicles and equipment must be regularly serviced and maintained. • Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery • Hazardous substances must be stored in bunded areas with impermeable concrete floors and a 110% capacity of the stored substance to prevent spillages

Impact	Mitigation measures
	• The fuelling zone must have an impermeable concrete slab with a pump-equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately. • In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24hours • WRD must have a class D engineered base. • All dirty water containment dams must have appropriate liners
Surface water contamination	• Stormwater Management infrastructure must be constructed to ensure ultimate containment during the operational phase • All spills must be cleaned immediately. • A 100m buffer must be maintained from the edge of the UMzumbe River during mining • A 100m buffer must be maintained from the wetland. Accidental spillage must be minimised and contained. • Vehicles and equipment must be regularly serviced and maintained. • Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery. • Hazardous substances must be stored in bunded areas with impermeable concrete floor and a 110% capacity of the stored substance to prevent spillages

Impact	Mitigation measures
	• The fuelling zone shall have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately. • In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24 hours
Wetland destruction	• Install the “NO GO ZONE” notices along the buffer area of the wetland, and • Undertake a “walk” on the boundary on the wetland to show and explain the NO GO area to the contract workers. • Implement the stormwater management system to ensure the preservation of the wetland during operational phase. • Increased runoff due to vegetation clearance and/or soil compaction must be managed by surface landscaping that will counter the speed of the runoff • Comply with additional conditions in the water use license regarding the wetland. • Flow continuity and connectivity of the freshwater features must be encouraged during construction activities.
Loss of habitat and wetland ecological structure	• Flow continuity and connectivity of the freshwater features must be encouraged during the construction phase. • Comply with additional conditions in the water use license regarding the wetland • All wetland areas adjacent to the mining footprint must be demarcated as no-go areas. • Runoff from paved surfaces should be slowed down by the strategic placement of berms; • Construct catch pits or structures to trap the eroded soil sediments before they reach the wetland and streams.

Impact	Mitigation measures
Impact on the hydrological functioning of the wetland	
Impact on Heritage Resources	• Cultural sites and graves uncovered during operations will be cordoned off, marked as no-go zones, and evaluated by a specialist before proceeding with further activity. • Graves relocations must be undertaken by the specialist with the participation of the owners of the graves.
Increased Traffic and Traffic Disruptions	• Manage traffic properly during construction to avoid accidents and congestion • Advise road users of the detour road if available • ensure that drivers obey all the rules of the road. • Clear signage must be erected to warn road users of the presence of heavy vehicles. • The access to the mine from the main roads must be designed in such a way as to comply with the relevant roads agency requirements. • Adequate signage should be erected indicating construction works during the construction phase. • Adequate flagmen to be employed to assist in directing traffic, especially during peak hours
Added traffic on the road network	• Road network will able to support additional truck traffic
Poor Visibility due to dust creation	• Implement dust suppression techniques where necessary. • the mine to ensure that visual impacts have been adequately managed and rehabilitated, in consultation and agreement with the applicable local authorities.

Impact	Mitigation measures
Lighting at night	The mitigation is to install the lights so that it is minimally directed toward the forest and more toward the community. This neutral mass lighting may impact the nocturnal animals in the nearby bush ecosystem and the mass lighting may also enhance security in the nearby residential area.
Littering on site.	• Littering is prohibited, and all waste generated from the site should be cleared regularly to a licensed facility. • A 'NO LITTERING& NO DUMPING" sign should also be placed on site. • Store waste in labelled containers (waste sorting), indicating clearly whether the waste is hazardous or non-hazardous • All waste generated on-site must be collected and transported to the nearest registered landfill site. • Where feasible, provide the recycling/waste sorting bins for domestic waste (different bins for cans, paper, bottles, etc.). • Good housekeeping must be practiced at all times to ensure that the construction site is kept neat and tidy.
Job Creation	• The mine shall develop and implement a recruitment policy that allows the equal opportunity to all people • The procurement policy for the mine should encourage the use of local service providers to encourage economic growth in the area. • The mine shall communicate frequently with the affected stakeholders to ensure that they understand the processes and do not develop unrealistic expectations that may lead to ill-informed grievances.

37.3. Potential risk of Acid Mine Drainage.

The AMD risk is very low for this project. The geochemical assessment/ leach test was undertaken in order to classify the waste facility in terms of GNR 635. The assessment recommendations are summarised as follows.

- The overburden material has low risk acid generating potential
- The waste rock comprise mainly of the massive gneiss (low risk acid generation potential) with a small percentage of pyrite mineralised waste rock (9 to11%).
- The presence of silicate minerals may offer some buffering of acid generation. In addition to this point, the second opinion from geological expert confirms that the presence of the silicate minerals in the dry stack will neutralise any pyrites associated with the mafic gneiss. This happens when the high silicate content of the dry tailings act as high acid consuming agent and thus neutralise the acid.
- Ore material is of low risk acid generation potential with aluminium and iron in a form of colloidal oxyhydroxides.
- The waste classification is type 4 with the class D engineered base and a design that encourage runoff

Potential impacts on surface water resources are expected to arise from the mining activities include chemical water quality deterioration or potential flow loss, however, the project will have minimal impact on the environment and mitigation measures are provided for in this environmental management programme**.**

37.3.1. Steps taken to investigate, assess, and evaluate the impact of acid mine drainage.

The geochemical report /leach test was undertaken to understand the acid generation potential of the material to be mined.

37.3.2. Engineering or mine design solutions to be implemented to avoid or remedy acid mine drainage.

Acid Mine Drainage is not anticipated for this project. However , the following measures will be undertaken to eliminate the risk and its impacts

- implementation of a class D engineered base for the WRD

- installation of an appropriate lining for the pollution control dams
- installation of subsurface drainage system for the WRD
- The WRD will be designed to encourage free drainage

37.3.3. Measures that will be put in place to remedy any residual or cumulative impact that may result from acid mine drainage.

Acid Mine Drainage is not anticipated for this project and the following mitigation measures are recommended for the potential impacts of the proposed project:

37.4. Volumes and rate of water use required for the mining, trenching or bulk sampling operation.

The operation requires approximately 60 000 Cubic meters of water/year. This quantity is for dust suppression, sanitation, consumption and processing plant.

37.5. Has a water use licence has been applied for?

An integrated Water Use License Application ("IWULA") process is underway. The application reference number is WU27214.

An Integrated Waste and Water Management Plan ("IWWMP") is also being compiled. The IWWMP will detail the waste stream, the water uses and storage as well as the storm water management. The IWWMP will be submitted to the department as a supporting technical document to the IWULA. An IWWMP serves as a management tool for the mine to manage storm water and waste water.

Section 21 of the National Water Act, 1998 (Act 36 of 1998) lists activities that require a license or registration if permissible under General Authorisation. The proposed project will require authorisations in terms of the water uses indicated in the table 35 below that will be triggered:

Table 36:Water Licence Listed Activities

Section 21 Activity	Water use description
Section 21 (a)	• Abstraction of surface water from the Umzumbe Rive • Possible abstraction of groundwater from boreholes (to be installed) • Use of the water from the pit
Section 21 (b)	Storing process water into the converted farm dam
Section 21 (c) & (i)	Impeding and diverting the flow by • Location of infrastructure close or on the drainage lines and river bank • Drainage line crossing infrastructure • Conversion of the farm dam into a process water dam
Section 21 (g)	Disposing of waste in a manner which may detrimentally impact on a water resource as follows • The waste rock and dry stack dump • The dump storm water dam • The plant return water dam • The mine biofilter • 2x prospective residence and office sewage system • Plant return water dam • Use of treated sewage effluent
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; by dewatering the pit

38. IMPACTS TO BE MITIGATED IN THEIR RESPECTIVE PHASES

The EMPr is the over-arching administrative and institutional document from which other documents take their authority. It is intended to be an overview document that specifies the on-site environmental management philosophy of the entire SA Lithium (Pty)Ltd mining operations and the organisational structure necessary to achieve that vision. In addition, it specifies common environmental management and monitoring principles that will be applied to all aspects of the project. The EMPr provides mitigation and management measures for the mining plan in the following phases of the project:

- Construction Phase
- Operational Phase
- Decommissioning Phase

38.1. Construction phase

This section of the EMPr provides management principles for the construction phase of the project. Environmental actions, procedures and responsibilities as required in the construction phase are specified. These specifications will form part of the contract documentation and, therefore, the Contractor/ mine will be required to comply with the specifications to the satisfaction of the Project Manager and Department of Mineral Resources and Energy as well as other regulators.

38.1.1. Construction phase of open pit and all mining related infrastructure.

The **Table 36** below describes the potential impacts, mitigation measures, standards and *m*onitoring frequency for the construction phase. The construction phase entails the site preparation of the mining pit, the road construction, the plant construction and construction of mining and processing supporting infrastructure such as the waste rock dump, the water reservoir, water pipeline, offices, workshop, change houses, storm water and return water dams, etc.

Table 37:Construction Phase Impacts, Mitigation Measures and Standards

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
Change in land Use from agriculture to mining	Site Preparation for the mining area (pit)	Topography	• Demarcate construction footprint and limit activities to the demarcated footprint.	Construction Phase	Restore land capability	Section 28 of National Environmental Management Act, 1998	Contractor
		Land use	• Limit all impacts only to the approved development footprint and the mining right area if necessary.	Construction Phase	Recover land capability to enable the continuation of land uses	Section 28 of National Environmental Management Act, 1998	Authorisation Holder
Air Pollution	Combustion of fuel by machinery & vehicles and emissions from exhausts, etc.	Air Quality	• Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards	Construction Phase	Minimise dust and gaseous emissions	National Environmental Management : Air Quality Act 39 0f 2004 & GNR 893 Minimum Emission Standards	Contractor
	• Driving on unpaved roads, • Creation of dust during Site Preparation for the mine pit, mining infrastructure & supporting infrastructure	Air Quality	• Suppress dust with water or environmentally friendly suppressant. • Monitor dust fallout • Vegetate soil stockpiles, berms and all exposed areas where possible • Set and ensure compliance with the speed limit on site. • Ensure that gravel roads are maintained	Construction Phase	Minimise dust and gaseous emissions	National Environmental Management : Air Quality Act 39 0f 2004 & GNR 893 Minimum Emission Standards	Contractor
Greenhouse gases emissions (cumulative impact)	From the procurement of supplies such as steel, use of electricity and emissions from the machineries and vehicles	Air Quality & Climate Change	• Plant trees to serve as the carbon sink and reduce carbon levels from the atmosphere • Investigate and use greener energy options such as solar to reduce electricity consumption and thereby reduce the project carbon footprint	Construction Phase	Minimise greenhouse gases emissions	National Environmental Management : Air Quality Act 39 0f 2004	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards				

Soil contamination	• Hydrocarbon & other industrial liquids spills from
	  ○ storage tanks & bays
	  ○ machinery & vehicle leaks,
	  ○ refuelling spills
	  ○ Waste generation and improper storage
		Soil	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent
			  ○ accidental spillage &,
			  ○ spillage caused by flooding or storm damage.
			• The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically
			• Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks.
			• Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary.
			• Spill kits will be provided for onsite spill clearing.
				Construction Phase	Prevent Soil contamination	National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331) and preparedness and response programme	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Provide skip bins for construction solid waste. • Provide normal bins for litre and locate them in strategic location to reduce littering potential. • Train the construction team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste associated with construction phase activities shall be temporarily stored in proper containers and will be disposed of at a relevant registered site. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite				
Soil Erosion	• Exposed surface due to clearance of vegetation • Topsoil stockpile • Change in topography which aid rapid surface runoff.	Soil	• Demarcate construction footprint and limit activities to the demarcated footprint. • Stockpile topsoil on a flats surface and away from drainage lines to prevent soil erosion. • At the end of construction rehabilitate the disturbed areas that will not be paved and use the topsoil to aid regrowth. • Grade and landscape the construction site to reduce the runoff speed (Terracing).	Construction Phase	Prevent Soil erosion	Conservation of Agricultural Resources Act 43 of 1983	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Encourage vegetation growth on topsoil stockpiles and berms to reduce the erosion • Keep as much original land cover as possible • Gravel roads must be graded to aid proper drainage				
• Loss or reduced land capability	• Change in land use from agriculture to mining. • Disturbance of soil profile and or soil sterilisation	Soil and land capability	• The construction or erection of infrastructures must be limited to the boundary of the demarcated footprint • When removing soil and overburden for stock piling, the topsoil, the subsoil and the waste rock and be stockpiled separately.	Construction Phase	Prevent loss of land capability	Conservation of Agricultural Resources Act 43 of 1983	Contractor
• Loss of topsoil as an environmental and agricultural resource	Change in land use from agriculture and land use	Agriculture	• Topsoil and where possible and feasible subsoil must be removed and stockpiled in all areas where the infrastructure will be built (waste rock dump, plant laydown and the pit areas), • Where necessary or if there is no safe/flat area to stockpile the topsoil, give is to the neighbouring farmers (to use for their crop farming) or use the soil at the off-set site to aid vegetation growth. • erosion berms must be constructed to minimize any further erosion from taking place. • Bush clearing contractors will only clear bushes and trees larger than 1m	Construction Phase	Prevent loss of fertile topsoil	Conservation of Agricultural Resources Act 43 of 1983	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			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 (only after alien vegetation has been removed);				
Noise generation and Increased noise levels	Construction vehicles traveling on access roads	Noise	• All adjacent landowners must be notified about the project prior to the commencement of construction • All equipment to be adequately maintained and kept in good working order to reduce noise. • Provide workers with hearing protection (ear plugs). • Use equipment or machinery that complies with the manufacture's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirements	Construction Phase	To minimise noise impacts on sensitive receptors	SANS 10103 Acceptable Ambient Levels and SANS 10210 of 2004, Noise Control Regulations – General Notice R154 of 10 January 1992	Contractor
Vegetation and habitat destruction	Clearance of vegetation on the mining footprint	Flora	• Remove vegetation only in the designated areas • Prioritise low-sensitivity areas (disturbed areas) rather than natural areas where feasible. • Use existing roads and tracks where feasible. • No open fires must be allowed on site such as for cooking.	Construction Phase	Prevent loss of Red Data species and Re-vegetation	National Environmental Management: Biodiversity Act, 2004	Monthly

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Prohibit harvesting of indigenous trees for firewood and indigenous flora in general. • Limit the development footprint of the proposed development as far as possible, • undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees.				
	Establishment of the work servitude along the road	Flora	• Remove vegetation only in the designated areas • Use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.	Construction Phase	Prevent loss of Red Data species and Re-vegetation	National Environmental Management: Biodiversity Act, 2004	Monthly
Vegetation and habitat destruction	Clearance of natural forest patches	natural forest and fauna	• Phased mining and vegetation clearance is preferred (dust, instead of removing vegetation on the whole footprint at once, remove only where it is necessary for the extent of mining to be done within a specific period. this will allow time for the fauna to migrate. undertake an annual tree planting drive each year (preferably during the arbour month) to offset the impact on trees.	Construction Phase	Prevent loss of Red Data species and Re-vegetation	National Environmental Management: Biodiversity Act, 2004	Monthly
Alien invasive establishment	removal of vegetation cover	Flora	• Compile and implement an alien invasive species management plan and implement it.	Construction Phase	Prevent loss of Red Data species and Re-vegetation	National Environmental Management: Biodiversity Act, 2004	Monthly

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
Loss of Faunal Life	• Habitat destruction (vegetation clearance) • Habitat fragmentation • Poaching • Animal-vehicle collisions	Fauna	• Limit development footprint to the approved demarcated plan. • Use semi-permanent means /material to demarcate or provide boundaries to construction areas to control the movement of personnel and vehicles. • No poaching is allowed. Non-compliance should carry a heavy fine. • Walk the area marked for vegetation clearance and soil removal few hours before to chase small animals away to reduce number of animal fatalities. • Do not kill snakes except when there is the immediate danger posed. •	Construction Phase	No loss of fauna and minimal destruction of natural habitats	National Environmental Management: Biodiversity Act, 2004	Contractor
Potential for accidents and injuries to workers	Construction of the mine and supporting infrastructure as well as Road Construction	Health and Safety	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) • All employees must be given adequate Personal Protective Equipment (PPE) • Environmental and safety awareness training (news letters or facilitated training) must be undertaken quarterly	Construction Phase	Injury free workplace	Occupational Health and Safety Act, 1993	Contractor/ License holder.
Groundwater pollution	Accidental Hydrocarbons Spillages during Construction of the mine and supporting infrastructure	Groundwater	• Accidental spillage must be minimised and contained. • Vehicles and equipment must be regularly serviced and maintained.	Construction Phase	Prevent water pollution	National Water Act 1998	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery • Hazardous substances must be stored in bunded areas with impermeable concrete floor and a 110% capacity of the stored substance to prevent spillages • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately. • In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24hours				
Surface water contamination	• Accidental Hydrocarbons Spillages that contaminate the runoff	Surface water	• Stormwater Management infrastructure must be constructed to ensure ultimate containment during the operational phase	Construction Phase	Prevent pollution of surface water	National Water Act 1998	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
	• Improper waste management		• All spills must be cleaned immediately. • A 100m buffer must be maintained from the edge of the Umzumbe River during mining • A 32m buffer must be maintained from the wetland. Accidental spillage must be minimised and contained. • Vehicles and equipment must be regularly serviced and maintained. • Refuelling of vehicles and equipment must be done with care to minimise chances of spillages. • Drip trays must be placed under parked vehicles and machinery. • Hazardous substances must be stored in bunded areas with impermeable concrete floor and a 110% capacity of the stored substance to prevent spillages • The fuelling zone shall have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Spill kits will be provided for onsite spill clearing. • Clean the spills immediately.				

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• In case of a major spill, record and report the incident to the Competent Authority and the Department of Water and Sanitation within 24hours				
Wetland destruction	Vehicle and personnel Movement in wetland areas	Wetland and Seeps	• Install the “NO GO ZONE” notices along the buffer area of the wetland, and • Undertake a “walk” on the boundary on the wetland to show and explain the NO GO area to the contract workers. • Implement the storm water management system to ensure the preservation of the wetland during operational phase. • Increased runoff due to vegetation clearance and/or soil compaction must be managed by surface landscaping that will counter the speed of the runoff • Comply with additional conditions in the water use license regarding the wetland. • Flow continuity and connectivity of the freshwater features must be encouraged during construction activities.	Construction Phase	Prevent Wetland destruction	National Water Act 1998 and National Environmental Management: Biodiversity Act 2004	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
Loss of habitat and wetland ecological structure Impact on the hydrological functioning of the wetland	Site preparation for the mining area (pit)	Wetland	• Flow continuity and connectivity of the freshwater features must be encouraged during the construction phase. • Comply with additional conditions in the water use license regarding the wetland • All wetland areas adjacent to the mining footprint must be demarcated as no-go areas. • Runoff from paved surfaces should be slowed down by the strategic placement of berms; • Construct catch pits or structures to trap the eroded soil sediments before they reach the wetland and streams.	Construction Phase	Prevent Wetland destruction	National Water Act 1998 and National Environmental Management: Biodiversity Act 2004	Contractor
Impact on Heritage Resources	Construction of the mine and supporting infrastructure	Heritage Resources	• Cultural sites and graves uncovered during operations will be cordoned off, marked as no-go zones, and evaluated by a specialist before proceeding with further activity. • Graves relocations must be undertaken by the specialist with the participation of the owners of the graves.	Construction Phase	Prevent destruction of heritage features	National Heritage Resources Act, 1999	Contractor
Increased Traffic and Traffic Disruptions	Site Preparation	Traffic	• Manage traffic properly during construction to avoid accidents and congestion • Advise road users of the detour road if available	Construction Phase	Accident- free roads.	Road Traffic Regulations	Contractor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• ensure that drivers obey all the rules of the road. • Clear signage must be erected to warn road users of the presence of heavy vehicles. • The access to the mine from the main roads must be designed in such a way as to comply with the relevant roads agency requirements. • Adequate signage should be erected indicating construction works during the construction phase. • Adequate flagmen to be employed to assist in directing traffic, especially during peak hours				
Added traffic on the road network	Employees and laborers Including Construction materials transportation to site	Traffic	• Road network will able to support additional truck traffic	Construction Phase	Accident-free roads	Road Traffic Regulations	Contractor
Poor Visibility due to dust creation	Site Preparation	Visual Impact	• Implement dust suppression techniques where necessary. • the mine to ensure that visual impacts have been adequately managed and rehabilitated, in consultation and agreement with the applicable local authorities.	Construction Phase	Minimal Visual disruption	Section 28 of National Environmental Management Act, 1998	Constructor
Lighting at night	Site Preparation for the open Cast pit mining	People and animals	The mitigation is to install the lights so that it is minimally directed toward the forest and more toward the community. This neutral mass lighting may impact the nocturnal animals in the nearby bush	Construction Phase	Minimal Visual disruption	Section 28 of National Environmental Management Act, 1998	Constructor

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			ecosystem and the mass lighting may also enhance security in the nearby residential area.				
Littering on site.	Site Preparation	Waste management	• Littering is prohibited, and all waste generated from the site should be cleared regularly to a licensed facility. • A 'NO LITTERING& NO DUMPING" sign should also be placed on site. • Store waste in labelled containers (waste sorting), indicating clearly whether the waste is hazardous or non-hazardous • All waste generated on-site must be collected and transported to the nearest registered landfill site. • Where feasible, provide the recycling/waste sorting bins for domestic waste (different bins for cans, paper, bottles, etc.). • Good housekeeping must be practiced at all times to ensure that the construction site is kept neat and tidy.	Construction Phase	Good house Keeping	Waste Management Strategy and Environmental Authorisation	Constructor and ECO
Job Creation	Site Preparation	Socio-economic Impact	• The mine shall develop and implement a recruitment policy that allows the equal opportunity to all people • The procurement policy for the mine should encourage the use of local	Construction Phase	Sustainable opportunities for social and economic growth	SLP	License holder

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			service providers to encourage economic growth in the area. • The mine shall communicate frequently with the affected stakeholders to ensure that they understand the processes and do not develop unrealistic expectations that may lead to ill-informed grievances.				
Increased Social Pathologies Linked to Influx of Workers and Job Seekers	Site Preparation for the open Cast pit mining	Socio-economic Impact	• Make it compulsory for contractors to submit a transport plan to ensure that workers are transported to and from their places of residence. • Should contractors and/or other persons with specialised skills not be available locally, the main contractor would be required to draw up and submit a housing plan that sets out how he will be dealing with employees from outside the municipal boundaries. • Draw up and implement a Local Employment Strategy as proposed in the Social Management Plan. • Do not create unrealistic job expectations and set clear goals with regards to local employment, employment numbers and so forth. Make this information available to the local communities;	Construction Phase	Sustainable opportunities for social and economic growth		License holder

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Collaborate with surrounding landowners through forums and ensure that stakeholders are aware of contact details and the procedures to raise complaints. • Deal with illegal structures expediently, follow the correct legal procedures and support landowners in this regard. • Provision of sufficient entertainment facilities in construction camps • Liaison with police, community policing forum and security stakeholders; • Maximisation of the proportion of job opportunities allocated to locals; • Construction workers should be clearly identifiable by wearing proper construction uniforms displaying the logo of the construction company. Construction workers could also be issued with identification tags. • The appointed contractor should establish clear rules and regulations for access to the construction site and offices to control loitering. Consultation should occur with the local police branch to establish standard operating procedures for the control and/ or removal of loiterers.				

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Liaison structures are to be established with local police to monitor social changes during the construction phase. Liaison should also be established with existing crime control organisations. • Limit, as far as reasonably possible, social ills caused by influx of workers and job-seekers; • Liaise openly and frequently with affected stakeholders to ensure they have information about the Project; • Extensive HIV/AIDS awareness and general health campaign. It should be noted that SA Lithium has no control over activities related to workers' behaviour, however it is recommended that HIV/AIDS campaigns are conducted within the affected area; • Discourage influx of job-seekers by prioritising employment of unemployed members of local communities; • Liaise with the RNLM, and the Traditional Authority to ensure that expected population influx is considered in infrastructure development and spatial development planning;				

Impact	Source /Activity	Environmental Aspect Impacted	Mitigation measures	Time Period for Implementation	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility
			• Create synergies with local government IDP to promote infrastructure development; • Clear identification of workers – prevention of loitering; • Liaison with police or establish/ support community policing forum; • Community education; and Implement measures to address potential conflict between locals and non-locals.				

38.2. Operational Phase

Operational phase potential impacts, mitigation measures, standards and monitoring frequencies are outline on the **table 37** overleaf.

Table 38: Operational Phase of the open pit and other infrastructure Mitigation Measures

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
Loss of geology and disruption of geological structure	Mining Activities: Open cast Excavations	Geology	• There are no mitigation measures for the loss of geology as the ore and some of the rock will not be returned to the pit. • To reduce the level of impact of disrupted geological structure when backfilling, stockpile the different overburden separately; the topsoil, subsoil and waste rock • Proper rehabilitation must be implemented. Where the backfilling is undertaken intentionally and systematically- with the waste/parent rock back first and followed by the subsoil and finally the topsoil. Mining must only be undertaken within the mining right and approved footprint.	Operational Phase	Minimise geological loss and restore the geological structure as close as possible to the pre-disturbance state	N/A	Contractor	Annually
Modified topography of the site	• Mining Activities: • Open cast pit development • waste rock stockpiling • Topsoil stockpiling	Visual/Topography	• Undertake concurrent rehabilitation throughout the operational phase grade the slopes of the rehabilitated pit area in a way that they will resemble the local topography. • The height of the stockpiles must not exceed 40m • Encourage revegetating of the soils stockpiles to blend in with the surrounding	Operational Phase	Minimise visual impact	Section 28 of National Environmental Management Act, 1998	Contractor	Annually
Increased noise levels	Mining Activities	Animals people (Employees and community)	• All equipment must be maintained and kept in good working order to reduce noise. • Provide workers with hearing protection devices (ear plugs) where required. • Use equipment or machinery that complies with the manufacturer's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirement	Operational Phase	To minimise noise impacts on sensitive receptors	SANS 10103 Acceptable Ambient Levels and SANS 10210 of 2004, Noise Control Regulations – General Notice R154 of 10 January 1992	Contract	Daily

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
Increased noise levels	Use of the road and transport to/from the site of people, material supplies and ore	Animals people (Employees and community)	• Speed limits must be kept low, • Mining equipment must be serviced regularly. • limit activities that course high noise levels between 6am and 8pm (except for the plant) • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit • air pressure discharge valves must have attenuators. • relocate the adjacent homestead to at least 600m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.	Operational Phase	To minimise noise impacts on sensitive receptors	SANS 10103 Acceptable Ambient Levels and SANS 10210 of 2004, Noise Control Regulations – General Notice R154 of 10 January 1992	Contract	Daily
	Processing of ore in the processing plant	Animals people (Employees and community)	• The plant must be maintained and be serviced regularly • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit • air pressure discharge valves must have attenuators. • relocate the adjacent homestead to at least 600m away from the mine	Operational Phase	To minimise noise impacts on sensitive receptors	SANS 10103 Acceptable Ambient Levels and SANS 10210 of 2004, Noise Control Regulations – General Notice R154 of 10 January 1992	Contract	Daily

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.					
Establishment of Alien invasive species	Removal of vegetation, soil and waste rock stockpiles, erosion of topsoil Mining,	Flora	• Develop and implement an invasive plant management plan throughout the lifespan of the project. • The monitoring of invasive species must be undertaken on a scheduled timeframe and will be allocated to a specific responsible person	Operational Phase	Control weed in the area	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	Contractor	Monthly
Vegetation and habitat destruction	• Removal of vegetation for mining activity & infrastructure • Dust dispersal from mining and road use, • Groundwater pollution by hydrocarbons spills and leaching	natural forest and fauna	• Restrict vegetation removal to the required footprint at a specific time period. Avoid vegetation removal for activities that will occur later. • Suppress dust adequately (to minimise deposition on the plants • Monitor dust fall out monthly (to confirm the efficiency of dust suppression. • Monitor the groundwater quality timeously (monthly) • Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ○ accidental spillage &,	Operational Phase	Conserve indigenous trees	National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically					
Soil Compaction	• Movement of vehicles & machinery • waste rock stockpiling	Soil and land capability	• Vehicles must stick to the designated roadways/pathways to eliminate soil compaction in areas not designated for disturbance. • If possible, remove the topsoil on the waste rock dump footprint and stockpile it for use during rehabilitation. • Rip & rehabilitate the compacted areas once the activity is completed	Operational Phase	Prevent soil erosion and ensure good house keeping	Section28 of National Environmental Management Act, 1998	Contractor	Weekly
Soil & water Contamination	• Hydrocarbons spills • Waste rock leaching &seepage • Improper waste management	Soil and water and waste management	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent ○ accidental spillage &, ○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks	Operational Phase	Prevent soil erosion and ensure good house keeping	Section28 of National Environmental Management Act, 1998 And National Water Act, 1998	Contractor	Weekly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material. • Drill groundwater monitoring boreholes and monitor them monthly for early detection water pollution Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Install leak detectors around the waste rock dump and monitor them weekly as recommended by supplier. Seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination • Spill kits will be provided for onsite spill cleaning. • Provide skip bins for construction solid waste. • Provide normal bins for litter and locate them in strategic location to reduce littering potential. • Train the mining team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Waste shall be temporarily stored in proper containers and will be disposed of at a relevant registered site timeously. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite • A clearly defined waste management plan must be compiled and implemented.					

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
Increased risk to public and worker safety:	Mining excavations, use of roads, and Ore Processing in the Processing plant	Health and Safety	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • All employees must be given adequate Personal Protective Equipment (PPE) including dust masks • Environmental and safety awareness training to be held frequently with workers. • All incidents must be recorded and rectified. The record must be filed on site • The mine must be fenced off to control access.	Operational Phase	Injury free workplace	Occupational Health and Safety Act, 1993 And Mine Health and Safety Act	Contractor/ License holder.	Daily throughout operational phase.
Increased risk to public safety:	Mining Activities:	Health and Safety	• Blasting must be undertaken by a certified person • Notify the public of the blasting dates and times • Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • Undertake annual community health, safety and environmental awareness drive	Operational Phase	Injury free workplace	Occupational Health and Safety Act, 1993 And Mine Health and Safety Act	Contractor/ License holder.	Daily throughout Operational phase.
Potential for accidents and injuries to the workers.	Mining Activities	Health and Safety	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) • Provide all employees with adequate Personal Protective Equipment (PPE) Environmental and safety awareness training to be held frequently with workers	Operational Phase	Injury free workplace	Occupational Health and Safety Act, 1993 And Mine Health and Safety Act	Contractor/ License holder.	Daily throughout Operational phase.
Potential increase of veld fires	• Cigarette stumps • Creation of fires onsite • Burning of waste	Fire control	• Open fire is prohibited on site. • Designate smoking areas and provide a bin for cigarette stumps to avoid accidental fires. • Burning of rubbish or any material is prohibited on site. • Training of staff must include fire prevention	Operational Phase	Injury free workplace	Occupational Health and Safety Act, 1993	Contractor and ECO	Daily throughout operational phase

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
• Loss of topsoil as a resource • Loss of Agricultural income	Change in land use to mining	Agriculture	• Ensure proper stormwater management designs are in place to minimise erosion • 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 (only after alien vegetation has been removed);	Operational Phase	Restore land capability	Conservation of Agricultural Resources Act 43 of 1983	Licence holder	Annually
Ground water Pollution	• Hydrocarbons spills • Waste rock leaching	Ground water	• Store fuel, chemicals and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent. ○ accidental spillage &, ○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump-equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks • A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material. • Drill groundwater monitoring boreholes and monitor them monthly for early detection water	Operational Phase	Achieving Drinking water Standard	National Water Act 36 of 998 And Drinking Water Standards	Contractor	Monthly for the initial three years. The frequency change will be determined by the results after 3 years.

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			pollution Compile the environmental emergency response/preparedness plan and train relevant employees to implement it when necessary. • Install leak detectors around the waster rock dump and monitor them weekly as recommended by supplier. • Seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination • Spill kits will be provided for onsite spill clearing. • Train the relevant mining team on the handling of hydraulic liquids and waste during induction and monthly meetings. • Vehicles and equipment must be serviced regularly. • Drip trays must be placed under parked vehicles and machinery • All water within the mine footprint area will be regarded as dirty • The groundwater resources must be monitored as required by the DWS. • Should impacts on groundwater be encountered an independent groundwater specialist will be appointed to investigate and provide the action. • A clearly defined waste management plan must be compiled and implemented.					
High rate of groundwater ingress causing	Mining Excavations Operation	Ground water	• the storm water system must be designed to divert the runoff away within the site from the pit into the storm water dam and the runoff offsite to the environment	Operational Phase	Prevent water pollution	National Water Act 36 of 1998	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
flooding of the pit								
Soil erosion, stream sedimentation and increased runoff speed	• Vegetation removal and • change in drainage system onsite , • transport of ore and waste rock to the plant and the waste rock dump • water course crossings	Surface water	• the storm water system must be designed to channel runoff onsite into the storm water dam and the runoff offsite to the environment with silt traps • clean up silt traps after every rain • The slopes must be profiled to prevent excessive erosion and reduce surface runoff speed. • Implement a stormwater management plan. • Where possible, design the mining area in a terracing model to reduce erosion. • Establish vegetation around disturbed areas to prevent any erosion; • Monitor erosion on site (in vulnerable areas) monthly by taking photographs and compile quarterly findings report with action plants where required • Trucks must not be overloaded with ore to avoid spillages of ore and rock that can be washed to the streams. • Before the completion of the storm water management system, clean up all ore and rock spills off the surface	Operational Phase	Prevent water pollution	National Water Act 36 of 1998	Contractor	Monthly
Surface water Pollution and disturbance of the flow of water	• hydrocarbon spills • poor waste management (sewage, mining and general waste)	Surface water	• Store fuel, chemicals, and other hazardous substances in suitable secure weather-proof containers with impermeable and bunded floors, a with a 110% capacity of the stored quantity to prevent. ○ accidental spillage &,	Operational Phase	Prevent pollution of surface water	National Water Act 36 of 1998	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
	• Mining infrastructure over drainage lines, • Pump equipment on the riverbank • mining activities • existence of culverts and water crossings		○ spillage caused by flooding or storm damage. • The fuelling zone must have an impermeable concrete slab with a pump equipped sump to collect potential spills automatically • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Provide drip trays under packed machinery • A comprehensive Material Safety Data Sheet list of all chemicals stored on site will be drawn up. • Contaminated soils must be managed as hazardous material. • Stormwater Management Plan implemented and maintained to ensure efficiency. • Minor spillages must be cleaned using spill kits • A 100m buffer must be maintained from the edge of the Umzumbe River during mining. • Remove litter & debris to stop blocking culverts and water channels. • Spill kits will be provided for onsite spill clearing. • Provide skip bins for construction solid waste. • Provide normal bins for litter and locate them in strategic location to reduce littering potential. • Train the mining team on the handling of hydraulic liquids and waste during induction and monthly meetings.					

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• Waste shall be temporarily stored in proper containers and will be disposed of at a relevant registered site timeously. • Domestic or general waste shall be disposed of at the municipal landfill/dumpsite • Undertake regular structural inspections of pumps and pipes exiting pit; • Ensure groundwater investigation is done to understand groundwater levels; • Stormwater culverts and clean water diversions should be designed and constructed to accommodate 1:50-year storm event.					
Impact on the aquatic life	• Abstraction of water from the Umzumbe River and • Sewage contamination (spills into the river)	Aquatic life	• Obtain a water use license to abstract water from the river • Undertake biomonitoring every 2 months for the initial year to check impacts on the invertebrates. • undertake biomonitoring biannually from year 2 onwards (based on the recommendation of the year one specialist report) • service the sewage system regularly to avoid spills. • in case of a blockage/spill, contain it onsite, fix & clean it immediately	Operational Phase	Prevent water pollution of	National Water Act 36 of 1998	Contractor	Monthly
• Loss of habitat and wetland ecological structure • Impact on the	Operation of the mine and maintenance of infrastructure	Wetland	• Flow continuity and connectivity of the freshwater features must be reinstated post-construction activities; • Remove litter & debris to stop blocking from drainage lines. • Regular monitoring of water quality must be implemented in order to ensure the impacts of	Operational Phase	Prevent wetland destruction	National Water Act 36 of 1998 National Environmental Management: Biodiversity Act 10 of 2004	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
• hydrological functioning of the wetland • disrupting the flow of water			runoff and decant of water into wetland resources are prevented or minimized. • All wetland areas adjacent to the operational footprint will be demarcated as no-go areas. • obtain a water use license for destruction the destruction of the artificial wetland next to the pit site • Adequate stormwater management must be incorporated into the design of the proposed development throughout all phases in order to prevent erosion of topsoil and the loss of floral and faunal habitat. In this regard, special mention is made of: Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed; • Runoff from paved surfaces should be slowed down by the strategic placement of berms; • All topsoil and waste stockpiles must have berms and catchment paddocks at their toe to contain runoff of the facilities.					
Impact on heritage resources	• Mining activities, • Movement onsite • maintenance of infrastructure	Heritage Resources	• Should artifacts or archaeological items be found during mining, use the chance find procedure to cater for accidental finds. • workers must be educated about the value of historical buildings and structures. • Mark and Cordon discovered heritage resources (old buildings and graves)	Operational Phase	Prevent destruction of heritage resources	National Heritage Resources Act, 1999	Contractor	Daily
Air Pollution	Dust generation by vehicles, machinery, soil erosion by wind and blasting	Air quality and people	• Dust suppression measures such as spraying of water on the site access route and around the site must be implemented.	Operational Phase	Minimise dust dispersal and gaseous emissions	National Environment Management: Air	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• Increase dust suppression efforts during conditions that aid excessive dust dispersal • Areas with difficulty to manage fallout dust and erosion may be treated with environmental-friendly chemical dust suppressant as opposed to using water • Speed limits must be established and enforced on-site and, on the road, to minimise dust dispersal. • Where necessary, cover the trucks carrying ore to the plant and waste to rock dump with tarpaulin • Encourage revegetation on soil stockpiles to reduce erosion by the wind			Quality Act 39 of 2004 & GNR 893 Minimum Emission Standards		
	Emissions of noxious gases from machinery & vehicles exhausts, processing plant.	Air Quality	• Where possible, use machineries/equipment with low emission potential. • Service the machineries regularly to ensure emission according to manufacturer standards • The plant must comply with air quality act emission standards.	Operational Phase	Minimise dust dispersal and gaseous emissions	National Environment Management: Air Quality Act 39 of 2004 & GNR 893 Minimum Emission Standards	Contractor	Monthly
Air Pollution	Ore Processing in the processing plant	Air quality	• The plant must comply with the air quality act and emit emission.	Operational Phase	Minimise dust dispersal and gaseous emissions	National Environment Management: Air Quality Act 39 of 2004	Contractor	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
						& GNR 893 Minimum Emission Standards		
	Transportation of ore to the plant and waste from the processing plant to the waste rock dump area.	Air quality/ Visual Impact	• Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions • Ore to the plant and waste to waste rock dump in trucks must be covered	Operational Phase	Minimise dust dispersal and gaseous emissions	National Environment Management: Air Quality Act 39 of 2004 & GNR 893 Minimum Emission Standards	Contractor	Monthly
Climate change	Direct and in-direct emissions from the exhaust, electricity consumption and mining supplies	Air Quality & Climate Change	▪ Where possible, supplement electricity from the Eskom grid with appropriate alternative renewable energy sources. ▪ Plant trees annually to serve as the project's carbon sink. ▪ Service the machinery regularly to ensure emission according to manufacturer standards.	Operational Phase	Reduce carbon footprint	GNR 893 Minimum Emission Standards	Contractor	Monthly
land & ambiance/aesthetics pollution	• Poor waste management • Poor management/no maintenance of sewage system	land and ambiance	• Waste disposal areas and bins will be placed strategically to encourage proper disposal on-site. • Waste generated onsite must be disposed of weekly at the nearest registered landfill or placed for pick up by the municipality • Maintain the sewage system regularly.	Operational Phase	Good house Keeping	Waste Management Strategy and Environmental Authorisation	Contractor and ECO	Daily

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
	• Poor house keeping		• Appoint a qualified person to maintain the sewage system. Waste rock must only be disposed of on the designated footprint • A clearly defined waste management plan must be compiled and implemented					
Impact on the road network	• Increase in traffic flow by additional vehicles and trucks to and from the mine • Damage to the road infrastructure	Traffic	• Ensure that the road network is able to support additional truck traffic. • Traffic control measures aimed at reducing the entrainment of material by restricting traffic volumes and reducing vehicle speeds. • Speed limits will be established and enforced on the mine to minimise accidents • Traffic signs to be put around the site to notify motorists and drivers about mining activities. • Deliveries and transportation should be carried out outside of peak traffic hours	Operational Phase	Free Accident Area.	Road Traffic Regulations	Contractor	Daily
vibration and sudden noise increase	Blasting	Animals & people (Employees and community)	• Blasting must be done by qualified persons only • Communicate by notice bards and other means of the planned blasting 2 to 3 days before it is undertaken	Operational Phase	Prevent injury to people & animals and damage to property.	Mine Health and Safety Act No. 29 of 1996 and Regulations	License holder	Monthly
Damage to property (houses, communication tower, cars, roads etc) .	Blasting	Ground Vibration And air blast	• Specific blast design to be done, shorter blast holes, smaller diameter blast holes, using electronic initiation to obtain single hole firing. Relocation of households within 500 m from the pit area.	Operational Phase	Prevent injury to people & animals and damage to property.	Mine Health and Safety Act No. 29 of 1996 and Regulations	License holder	Monthly
Non-compliance	Impact of non-compliance with the	Environmental & socioeconomic aspect	• Undertake internal EMP audit quarterly and address the non-compliances within the time frame of the approved action plan	Operational Phase	Full compliance with EMPr conditions	National Environmental	License holder	Quarterly and annually

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
	EMP by the developer		• Undertake an Independent EMP audit annually and address the non-compliances within the time frame of the approved action plan • Place complaints and input book at the gate to allow recoding of non-compliances observed by I&Aps and address complaints or non-compliances.			Management Act and Regulations		
Injury / Fatality (people and/or animals) •	Blasting	Air blast & Fly rock	• This specific blast design must be implemented: ∞ shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect. • Use of specific stemming to manage fly rock - crushed aggregate of specific size. • Re-design with increased stemming lengths. • Relocate households within 500 m from the pit area. • Evacuation of people and animals out of danger zone defined by mine COP. (minimum 500 m.) • undertake Structural survey for houses within 1km radius boundary of the mining right area.	Operational Phase	Prevent injury to people & animals and damage to property.	Mine Health and Safety Act No. 29 of 1996 and Regulations	License holder	Monthly
Fly Rock in dam	Blasting	Fly rock						
Fly Rock damage at the Communication tower	Blasting	Fly rock						
Creation of Employment and business opportunities	Mining and related activities (mining jobs, subcontracts, suppliers)	Socio-economic benefit	• prioritise the local people in employment and business opportunities • Local businesses must be given preference in appointments • Employment criteria must be communicated to the community in advance (e.g. in newspapers,	Operational Phase	Fair employment practises	Social and Labour Plan	License holder	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			KwaMadlala Mining committee, community notice boards, etc);					
Increase in population Size of the local community/town	Influx of people in to the local community and town for economic opportunities	Socio-Economic	• Local labour must be employed as far as possible;	Operational Phase	Fair employment practices	Social and Labour Plan	License holder	Monthly
increased social pathologies linked to influx of workers and job seekers	Influx of people in to the local community and town for economic opportunities	Socio-economic Aspect	• HIV/AIDS, drug abuse and domestic violence awareness campaigns. • A voluntary counselling and testing (VCT) programme should be introduced. • Align awareness campaigns with those of other organisations in the area. • To limit, as far as reasonably possible, social ills caused by influx of workers and job-seekers; • To liaise openly and frequently with affected stakeholders to ensure they have information about the Project. • To make available, maintain and effectively implement a grievance/complaint register that is easily accessible to all neighbours and affected stakeholders.	Operational Phase	Fair employment practices		License holder	Monthly
Spread of Communicable Diseases	In-Migration	Human Health	• Collaborate with the department of health (DoH) on awareness-creation around vaccinations for communicable diseases for vulnerable sub-populations such as children and old people; • Labour policies should encourage hiring of local staff to avoid excessive job-seeking migrants. The Project should not hire at the “front gate” but	Operational Phase	Healthy Environmental		License holder	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			consider a recruitment office at an off-site location. This will need to consider national recruitment and employment requirements; • Reduce the prevalence of communicable diseases by collaborating with relevant government departments and schools for awareness creation and improved understanding of factors exacerbating communicable diseases, including coping strategies that result in behaviour change; and initiating competitions at schools for illustrating innovative ways to improve conditions at home - either by reducing exposure and susceptibility or increasing coping capability. • Support community-based information campaigns related to TB symptoms and the need to seek care. The campaign should address the risk of co-infection between HIV and TB; • Influx management and advice with regards to town planning to prevent overcrowding; and • Develop partnerships to support the community-based TB control programs in conjunction with the DoH and any NGOs. This needs to include case detection, management and surveillance activities under the national TB program policy and strategy.					
Community and employee health and safety	Mining operation and the use of commercial trucks and machinery	Human Injuries	• Engage the Local Municipality and interested and affected parties to assist with programmes targeted at improving traffic management and road safety in the study area;	Operational Phase	Injury free area		License holder	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• Develop a clear policy for the management of emergencies or accidents in the community as a direct result of the activities of the project;					
Noise, air quality and hazardous material	• Blasting and other mining activities	Human Health	• All employees and contractors should receive Health and Safety induction that includes an environmental awareness component (noise). This is to allow employees and contractors to realise the potential noise risks that activities (especially night-time activities) pose to the surrounding environment. • Place a complaints and input register at the gate for interested and affected parties • to lodge their complaint The mine must investigate any reasonable • The mine investigates the use of white-noise alarms instead of tonal reverse alarms on heavy vehicles operating on roads, within the mining area and at stockpile areas; • Develop a dust management plan; Apply wetting agents, dust suppressant or binders on the exposed area; • Vegetate, with grass or a gravel monolayer, the exposed areas; • Reduce erosion loss by roughening slope surface - this dissipates energy of water or wind moving over the slope; • Assess the angle of the slope, as maximum erosion occurs on slopes with angles between 30° and 35°.	Operational Phase	Prevent injury to people & animals and damage to property.	Mine Health and Safety Act No. 29 of 1996 and Regulations		

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			• Improve upon the surface strength of a slope, which will lower the rate of erosion; • Implement PM monitoring and continue with ongoing dust fallout monitoring. • Collect data on a longitudinal basis from the local health centres on incidence of increased respiratory disease - especially respiratory tract infections that could be ascribed to dust. While these may not be specifically ascribed to the Project, the prevailing trends are useful to monitor so that any concerns could be addressed. This may require health systems strengthening to support recording; and • Establish a monthly and annual reporting structure to appraise performance, compliance and complaints. • A comprehensive, continuous air quality monitoring programme must be undertaken to ensure that mitigation measures are applied at all times to keep ambient air concentrations of PM_{10} and $PM_{2.5}$ within the NAAQS over residential areas; Mining related machines and vehicles to be serviced to the designed requirements of the machinery/vehicles to ensure noise suppression mechanisms are effective; Develop and implement a Storm Water Management Plan; Undertake groundwater and surface water monitoring;					

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			seepage water from the rock dump should be channelled to a central collection point to avoid water resource contamination					
Increased GBV, Crime alcohol and drug abuse	In- Migration	Human social and economic	• Reduce substance-abuse and improve social cohesion by: ✓ Conducting substance-abuse prevention education programs in the schools within the Potentially Affected Communities (Umzumbe and surrounds); ✓ Providing recreational facilities for workers without families; ✓ Contributing to the establishment of appropriate community recreation facilities- considering needs and assets of the community; ✓ Collaborating with the relevant authorities to establish a system to monitor violence and community cohesion related to Project activities – provide technical skills; ✓ Participating in violence-prevention education programs, particularly focusing on gender violence and tribalism. ✓ Supporting education programs with a gender equity focus; ✓ Identify and support vulnerable groups; and • Support graduate training programs for the youth in the community	Operational Phase	Healthy living Environment		License holder	Monthly
Bad lifestyle habits	Mining employment	Human Health	• Support health education programs as part of a community-based peer health educator program; • Support the local healthcare personnel with training on disease-management programs and	Operational Phase	Healthy living Environment		License holder	Monthly

Impact	Source/ Activity	Environmental Aspect Impacted	Mitigation measures	Implementation period	Goal to be achieved.	Compliance standards (regulatory standard)	Responsibility	Monitoring frequency
			the recognition of NCD symptoms and management thereof.					

38.3. Decommissioning, rehabilitation and closure phase

The Decommissioning, rehabilitation and closure phase entails the cessation of the operation followed by the rehabilitation of the site, the application for closure with post closure monitoring and finally the closure of the site. This phase of the mine will see the decrease in negative impacts (See table 38 overleaf). Once rehabilitation is completed, the post closure operation impacts will be very minimal. It is to be noted that the rehabilitation process also have negative impacts, however such impacts are not of the magnitude of the operational phase. This section outlines mitigation measures that must implemented during the decommissioning phase of the project.

Table 39: Decommissioning Phase potential impact, mitigation measures and standards to be achieved of the project

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
Improved impact on the topography	Rehabilitation activities	• Visual • Topography	• Rehabilitate the Undertake concurrent rehabilitation throughout the operational phase and grade slopes of the pit area in a way that they will resemble the local topography. • Backfill the pit with the waste rock (& the process waste) and the soil stockpiles. • Grade/shape the mining area and remaining landforms to blend with the surrounding • Encourage revegetating of the soils stockpiles to blend in with the surrounding • The area must be shaped to be free draining.	decommissioning phase	Restore land capability	Section 28 of National Environmental Management Act, 1998	Contractor	Weekly
Improved soil conditions	Removal of mining infrastructure	Soil and land Capability	• Implement a rehabilitation plan • Revegetate as quickly as possible to limit erosion and sedimentation in downstream water resources. • Vehicles must stick to the designated roadways/pathways to eliminate soil compaction in areas not designated for disturbance. • Rip & rehabilitate the compacted areas once the activity is completed. • Rehabilitated areas must be fenced off until it is determined that the landscape is stable.	decommissioning phase	Prevent soil contamination and Good House Keeping	Standards for the Remediation of Contaminated Land and Soil Quality (GN 37603 No 331) And Section28 of National Environmental Management Act, 1998	Contractor / ECO	Weekly
Soil & water Contamination	• Spillage of hydrocarbons • Removal of mining Infrastructure	• Soil • Water • waste management	• The fuelling zone must have an impermeable concrete slab with a pump-equipped sump to collect potential spills automatically. • Ensure that the machinery and vehicles are properly maintained, regularly serviced and inspected to make sure there are no hydraulic fluids leaks. • Spill kits will be provided for onsite spill cleaning. • Place drip tray under packed vehicles.	decommissioning phase	Prevent soil erosion and Good House Keeping	Standards for the Remediation of Contaminated Land and Soil Quality &	Contractor	Weekly

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
	• Leaching of remaining waste rock & backfilled pit		• Domestic or general waste shall be disposed of at the municipal landfill/dumpsite • waste management plan must be implemented. • Monitor the ground water for leaching potential from the operational phase to post closure			Conservation of Agricultural Resources Act 43 of 1983		
Air Pollution	• Removal of mining infrastructure • Emissions of noxious gases from machinery & exhausts,	Air Quality and Visual	• Where possible, use machineries/equipment with low emission potential. • Service the machinery regularly to ensure emission according to manufacturer standards	decommissioning phase	Minimise dust and gaseous emissions	National Environment Management: Air Quality Act 39 of 2004 GNR 893 Minimum Emission Standards	Contractor	When required
Air Pollution	Vehicles movement	Air Quality and Visual Aspect	• Dust suppression methods must be applied when necessary to restrict the visual impact of dust emissions • Speed limits will be established and enforced on the mine to minimise dust generation.	decommissioning phase	Minimise dust and gaseous emissions	National Environment Management: Air Quality Act 39 of 2004 GNR 893 Minimum Emission	Contractor	When required (when roads/site dries out and creates dust)
Water Pollution	• Closure Period • Rehabilitation activities	Surface water	• Storm water Management Plan must be maintained until rehabilitation activities have been completed and the area is regarded as stable. • At that stage, the infrastructure will be removed and the area will be shaped to ensure free drainage.	decommissioning phase	Prevent water pollution	National Water Act, 1998	Contractor	Monthly
• Loss of habitat and wetland ecological structure	• Closure Period • Rehabilitation activities	Wetland	• Regular monitoring of water quality must be implemented in order to ensure the impacts of runoff and decant of water into wetland resources are prevented or minimized.	decommissioning phase	Prevent wetland destruction	National Water Act, 1998 & NEMBA	Contractor	Monthly

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
• Impact on the hydrological functioning of the wetland • disrupting the flow of water			• All wetland areas adjacent to the operational footprint will be demarcated as no-go areas. • Adequate stormwater management must be incorporated into the design of the proposed development throughout all phases in order to prevent erosion of topsoil and the loss of floral and faunal habitat. In this regard, special mention is made of: Sheet runoff from cleared areas, paved surfaces and access roads needs to be curtailed; • Rehabilitation should be conducted in a manner that ensures wetland features' conditions are reinstated to natural state as possible.					
Impact on Heritage Sites	• Removal of mining infrastructure • Closure	Heritage Impacts	• Should artifacts or archaeological items be found during rehabilitation activities, use the chance find procedure to cater for accidental finds.	decommissioning phase	Prevent destruction of heritage features	National Heritage Resources Act, 1999	Contractor	Daily
Improved Visual Impact	• Removal of mining infrastructure • Closure Period	Visual Impacts	• Removal of infrastructure must improve the general visual impact of the area. • Consideration must be given to the existing sense of place for the region	decommissioning phase	Minimal Visual disruption	Section 28 of National Environmental Management Act, 1998	Constructor	Monthly
Disrupted geological structure	Rehabilitation activities.	Geology	• Undertake concurrent rehabilitation throughout the operational phase by backfilling the pit. • Backfilling must be undertaken intentionally and systematically- with the waste/parent rock backfilling first and followed by the subsoil and finally the topsoil.	decommissioning phase	Reduce loss of geology and recover the pre-mine state as close as possible		Contractor	Annually
Improvement of vegetation	Rehabilitation activities	Flora	• The rehabilitation activities must be undertaken in such a manner to promote the self-succession of vegetation. • implement an invasive plant management plan throughout the lifespan of the project	decommissioning phase	Prevent loss of Red Data species and Re-vegetation	National Environmental Management:	Contractor	Monthly

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
			• Rehabilitated areas must be fenced off up until it is determined that the landscape is stable. • The monitoring of invasive species must be undertaken on a scheduled timeframe			Biodiversity Act, 2004		
Conversion and diversification of land use	Social Change Process: Geographic processes	Socio-Economic	• Educate landowners in terms of their rights and responsibilities prior to the project going ahead and expectations during rehabilitation.	decommissioning phase	Fair consultation process	2014 EIA regulation Chapter 6	License holder	Annually
Employment and training opportunities	Mining operation and the use of commercial trucks and machinery	Human social and economic	• Develop and implement an integrated Mine Closure Plan with the input of the interested and affected parties. • Develop an exit strategy for any social projects that were implemented during the operational phase in advance before the closure of the project. • Follow a clear communication strategy to inform the local community of arrangements made related to social spending and project closure. Stakeholder engagement and communication should also be in advance prior to closure. • Proactively assess and manage the social and economic impacts on individuals, regions, and economies where retrenchment and/or closure of the Project are certain • Develop mechanisms to assist employees prior to retrenchment in the transition phase. • This includes offering portable skilled development programmes during the operational phase, providing assistance in assessing available and suitable jobs with other local mines or companies, provide positions during the maintenance and rehabilitation phase. • Include non-core-related local supply links during the operational phase to facilitate easier transitioning from local suppliers to other industries.	decommissioning phase	Human capacity building	Human Resource Development	License holder	Monthly

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
Risk to public and worker safety:	Rehabilitation activities	Health and Safety	• Comply with all the relevant requirements of the Mine Health and Safety Act (Act 29 of 1996) with regard to blasting • All employees must be given adequate Personal Protective Equipment (PPE) including dust masks • Environmental and safety awareness training to be held frequently with workers. • The mine must be fenced off to control access.	decommissioning phase	Injury free workplace	Occupational Health and Safety Act, 1993 & Mine Health and Safety Act	Contractor/ License holder.	Daily throughout decommissioning phase
Potential increase of veld fires	• Cigarette stumps • Creation of fires onsite • Burning of waste	Fire control	• Open fire is prohibited on site. • Designate smoking areas and provide a bin for cigarette stumps to avoid accidental fires. • Burning of rubbish or any material is prohibited on site.	decommissioning phase	Injury free workplace	Occupational Health and Safety Act, 1993 & Mine Health and Safety Act	Contractor	Daily throughout Decommissioning phase
Increased noise levels	Rehabilitation activities	Animals people (Employees and community)	• All equipment must be maintained and kept in good working order to reduce noise. • Provide workers with hearing protection devices (ear plugs) where required. • Use equipment or machinery that complies with the manufacturer's specifications and acceptable noise levels • Monitor noise levels as per the MHSA/occupational health requirement • limit activities that course high noise levels between 6am and 8pm (except for the plant) • The plant noise level must not exceed 70dBA • any tonal alarms that are used during the day must not be audible to any of the receptors • all plant equipment must be procured in strict consideration of the 70dBA limit • air pressure discharge valves must have attenuators.	decommissioning phase	Minimal damage	Occupational Health and Safety Act, 1993 & Mine Health and Safety Act	License holder	Monthly

Impact	Activity/ Source	Aspect	Mitigation measures	Implementation Period	Standard to be achieved.	Compliance standards	Responsibility	Monitoring frequency
			• relocate the adjacent homestead to at least 600m away from the mine • undertake base line noise level monitoring prior to each phase • Undertake bi-annual (twice a year) environmental noise monitoring • place a complaint and input register at the gate and address the complaints timeously.					
Non-compliance	Impact of non-compliance with the EMP by the developer	Environmental & socioeconomic aspect	• Undertake internal EMP audit quarterly and address the non-compliances within the time frame of the approved action plan • Undertake an Independent EMP audit annually and address the non-compliances within the time frame of the approved action plan • Place complaints and input book at the gate to allow recoding of non-compliances observed by I&Aps and address complaints or non-compliances.	decommissioning phase	Full compliance with EMPr conditions	National Environmental Management Act and regulations	License holder	Quarterly and annually

39. IMPACT MANAGEMENT OUTCOMES

(A description of impact management outcomes, identifying the standard of impact management required for the aspects contemplated in paragraph ();

All the above requirements related to construction, operational and decommissioning phase are addressed in Table 37, Table 38 and Table 39 above.

40. IMPACT MANAGEMENT ACTIONS

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

All the above requirements related to construction, operational and decommissioning phase are addressed in table 36 to Table 38 above.

41. FINANCIAL PROVISION

41.1. Determination of the amount of Financial Provision.

41.1.1. Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under Regulation 22 (2) (d) as described in 2.4 herein.

Closure objectives are outlines under item 37.1 of this report.

41.1.2. Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.

The environmental objectives will be relayed to the land owners and interested and affected parties in the draft report for review and comments during public participation process period.

41.1.3. Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.

The Rehabilitation Plan Report will be attached as Appendix 3 of this report for the rehabilitation requirements. Table 39 below indicates the various responsibilities and responsible parties for the rehabilitation activities.

Table 40:Responsibilities and responsible parties for rehabilitation activities

Responsible Party	Responsibility
Environmental Control Officer (ECO)	• Planning of rehabilitation projects • Initiating rehabilitation project
Contractor	Rehabilitation Activities
ECO	• General monitoring/surveillance and reporting and coordination • Implementation/coordination with regard to particular environmental measure/action plans
ECO	Audits (Environmental Performance Assessment.)
ECO	Review of financial provision

41.1.4. Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.

The closure objectives and the closure plan are aligned. That is, the closure objectives are aimed at leaving the project site as far as possible, in the state which is safe and which will allow natural succession and the rehabilitation plan is compiled in response to these closure objectives.

41.1.5. Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.

The amount that is required to both manage and rehabilitate the environment is **R82 855 727,59** (Eighty-Two Million, Eight Hundred and Fifty-Five Thousand Seven hundred and Twenty Seven Rand and Fifty-Nine Cents)**.** See **Figure 42** for the quantum breakdown.

CALCULATION OF THE QUANTUM

Applicant: **SA Lithium (Pty)Ltd** **Ref No.:** **KZN30/5/1/2/2/10116MR.**

EAPs: **Joan Consulting (Pty)Ltd** **Date:** **Mar 23**

No.	Description	Unit	A Quantity	B Master Rate	C Multiplication factor	D Weighting factor 1	E=A*B*C*D Amount (Rands)
1	**Dismantling of Processing plant and related Structure (including overland conveyors and powerlines)**						
i	Steel Structure and Building (Plant Workshop)	m3	45000	271,16	1	1	R12 202 200,00
ii	Reinforced Structure(Concrete bases at Plant)	m3	40000	399,61	1	1	R15 984 400,00
2 (A)	**Demolition of steel buildings and structures**						R0,00
i	Crushers	m2	240	271,16	1	1	R65 078,40
2(B)	**Demolition of reinforced concrete buildings and structures**						
ii	Sub-Station	m2	0	399,61	1	1	R0,00
iii	Explosive Magazine	m2	385	399,61	1	1	R153 849,85
iv	Loading Station	m2	25	399,61	1	1	R9 990,25
v	Weighbridge	m2	60	399,61	1	1	R23 976,60
viii	Fuel Storage	m2	64	399,61	1	1	R25 575,04
9	Workshop Floor	m2	3000	399,61	1	1	R1 198 830,00
10	Raw Water Pond	M2	16000	399,61	1	1	R6 393 760,00
3	**Rehabilitation of access roads**						
1	Service Roads Ripping	m2	0	48,53	1	1	R0,00
3	Haul Roads Ripping	m2	0	48,53	1	1	R0,00
5	Access Roads	m2	2520	48,53	1	1	R122 295,60
4 (A)	**Demolition and rehabilitation of electrified railway lines**	**m**	0	0	1	1	R0,00
4 (A)	**Demolition and rehabilitation of non-electrified railway lines**	**m**	0	242,35	0,52	2	R0,00
5	**Demolition of housing and/or administration facilities**						R0,00
i	Other Building (Admin Building)	**m2**	1200	542,33	**1**	**1**	R650 796,00
iv	**Opencast rehabilitation including final voids and ramps**						R0,00
v	Open Pit	ha	40,1	276014,6	1	1	R11 068 185,46
8 (A)	**Rehabilitation of overburden and spoils (Waste rock)**	**ha**	56	189528,13	**1**	**1**	R10 613 575,28
8 (B)	**Rehabilitation of processing waste deposits and evaporation ponds (non-polluting potential)**	ha	0	236053,85	1	1	R0,00
8 (C)	Rehabilitation of processing waste deposits and evaporation ponds (polluting potential)	ha	0	685612,26			R0,00
9	Rehabilitation of subsided areas	ha	0	158701,25	1	1	R0,00
10	**General surface rehabilitation**						R0,00
12	**Fencing**						R0,00
1	Fences	**m**	3048	171,26	**1**	**1**	R522 000,48
13	**Water management**	**ha**	3,2	57086,78	**1**	**1**	R182 677,70
14	**2 to 3 years of maintenance and aftercare**	**ha**	41,2	19980,38	**1**	**1**	R823 191,66
15 (A)	**Specialist study**	**Sum**	0	0	**1**	**1**	R0,00
15 (B)	Specialist study	Sum	0	0	1	1	R0,00
					Sub Total 1		R60 040 382,31
1	Preliminary and General		10,00%		**weighting factor 2** 1		R6 004 038,23
2	Contingencies				10%		R6 004 038,23
					Subtotal 2		R72 048 458,77
					VAT (15%)		R10 807 268,82
					Grand Total		**R82 855 727,59**

Figure 43: Rehabilitation Financial Provision

41.1.6. Confirm that the financial provision will be provided as determined.

The financial provision will be provided as determined upon request by the competent authority.

42. MECHANISMS FOR MONITORING COMPLIANCE WITH AND PERFORMANCE ASSESSMENT AGAINST THE ENVIRONMENTAL MANAGEMENT PROGRAMME AND REPORTING THEREON, INCLUDING

42.1. Monitoring of Impact Management Actions

Monitoring of the impact management actions will be done by the Environmental Control Officer (ECO) and the project manager. The ECO must be based on site to ensure that all management actions are implemented timeously. Should, under any circumstance, the contractor's activities pose any damage on the environment and not comply with measures and impact management actions as stipulated in the EMP and Integrated Environmental Authorisation, the EA holder will be held responsible for any such non-compliance. It is therefore the responsibility of the EA Holder to ensure that all relevant measures are taken to rectify such damage, at the contractor's expense. It is the duty of the ECO to monitor compliance with the EMP, and report and notify the contractor of any non-compliance, highlighting the following:

- Details of the nature of the non-conformance;
- The actions to be taken to correct the situation; and
- The date by which each corrective action should be executed.

The contractor will also be liable to produce a Corrective Action Plan, which will detail how the required corrective actions will be implemented. This plan will be submitted to the ECO and Project Manager for approval prior to implementation and the corrective measures have been carried out, the ECO will then be required to sanction the success or failure of the corrective action**.**

42.2. Monitoring and reporting frequency

For the first five years, surface water monitoring, ground water monitoring, dust fall monitoring, will be done monthly and the reporting to the competent authority will be done annually. Any non-compliances will be recorded and plans of actions documented.

NB: for construction phase & 3 months post construction, surface water monitoring will be done weekly.

42.3. Responsible persons

The right and authorisation holder is ultimately responsible for compliance with the conditions of the authorisation and right. However, for this EMP to be implemented effectively, all role players involved in the project need to comply with the directives set out in the authorisations. A concise description of impacts and their mitigation/management measures will be provided and understood by all role players responsible for the implementation and monitoring of the mitigation measures

This project will comprise of the following responsible role players:

- Competent Authority (DMRE)
- Environmental Control Officer (ECO);
- Project Manager and
- The Developer (Permit/license holder).

These parties will ensure that all conditions stated on the right are adhered to and that all environmental management requirements are met. Each person's responsibility is detailed in the Table 40 below.

Table 41:Responsible Persons for the Project

Functions	Responsibility
Authorisation holder	Ensuring compliance to the EMP and conditions contained in the Integrated Environmental Authorisation (IEA). Contracting the Environmental Control Officer as an independent appointment to objectively monitor and implement the applicable environmental legislation.

Functions	Responsibility
Project Manager	Complete responsibility of the whole project and any contracted parties and ensuring that all environmental management facets are adhered to. The Project Manager will be supported by the ECO, with the following roles and responsibilities during the operations; • Review annual reports compiled by Environmental Control Officer (ECO); • Identify the need for remedial measures with regard to proposed works; • Communicate directly with the Contractors; and • Issue non-conformance notifications to Contractors that do not comply with the requirements as set out in the EMP.
Environmental Control Officer	• Objectively monitor, implement applicable environmental legislation, conditions of Integrated Environmental Authorisations (IEA's) and the EMP. • Conduct audits on compliance to applicable environmental legislation, conditions of EA's and the EMP. Including size and sensitivity of the development (on grounds of the EIA). • Liaison between the relevant authorities and project team. Any changes in environmental conditions, registration and updating of all EMP documentation should be communicated and carried out by the ECO • Develop environmental awareness training for all new site personnel (e.g. posters, tool box talks, signage); • Undertake visual inspections of the activities of employees with regard to implementation of the requirements outlined in the EMP; • Immediately notify the Project Manager of any non-compliance with the EMP, or any other complaints or issues of environmental concern; • Ensure that all environmental monitoring programmes are carried out according to protocols and schedules.
Competent Authority (DMRE)	The department responsible for approving the Environmental Authorisation application. Ensuring that the monitoring and adherence to EMPs is carried out, by going through/reviewing audit reports submitted by the ECO and conducting regular site visits.
Contractor	A Contractor will be employed by the developer for different components of the project. The Contractor's primary responsibilities are to construct the works and ensure compliance with the EMP whilst carrying out the work.

42.4. Time period for implementing impact management actions

The impact management actions must be implemented as per the action plan.

42.5. Mechanism for monitoring compliance

Table 41 describes the mechanism for monitoring compliance and **Figure 44** shows the monitoring network for dust, surface water and groundwater.

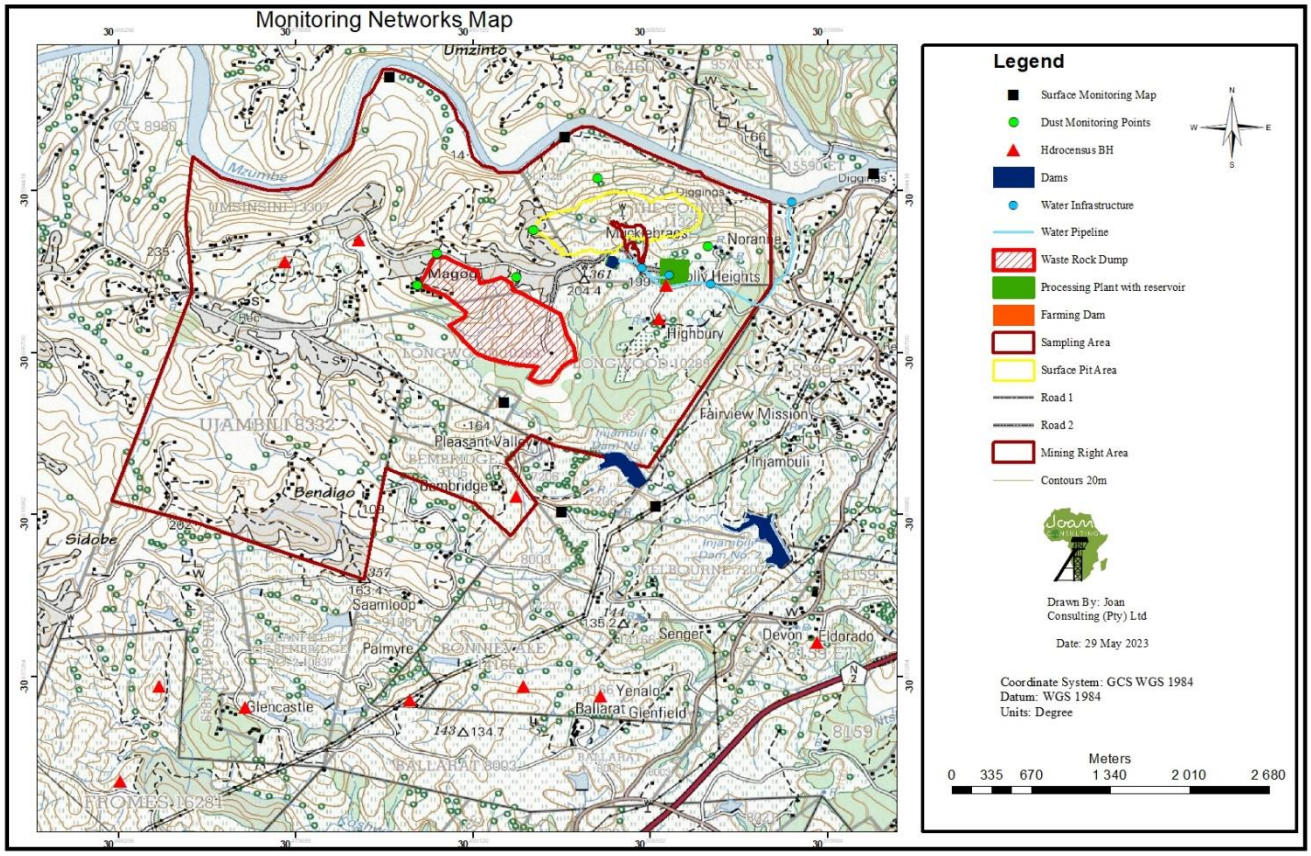

Figure 44: Monitoring network map

Table 42:Mechanism for monitoring compliance

Activity	Associated Potential Impacts	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Construction and operation	Noise generation (-ve)	• Maintain a complaint register that is made accessible to the locals • Undertake a safety inspection to ensure all workers are wearing protective ear plugs during blasting operations	ECO and Project/Site Manager	• Monitor Monthly • Weekly reporting on any complaints
Construction and operation	Soil contamination by oil spills from vehicles (-ve)	• Daily inspection of operational equipment • Service vehicles timeously	ECO& Project Manager	• Daily inspection • Weekly reporting • Services vehicles within prescribed services periods • Immediate implementation of management actions
Construction and operation	• Improper waste disposal.	Inspection of waste storage and ablution facilities and the general site inspection for any oil spillages	ECO & Project Manager	• Weekly monitoring • Monthly reporting

Activity	Associated Potential Impacts	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
	• Contamination of soil and underground water by spills from mobile ablution facilities			• Immediate implementation of management actions
Construction and operation	Dust	• Safety inspections to ensure all workers are wearing protective gears during operation. • Inspection of access roads and site are sprayed. Maintain a complaint register that is made accessible to the locals	ECO &Occupational Hygienist Project Manager	• Monthly monitoring and reporting • Immediate implementation of management actions • Monthly reporting on any non-compliances • Daily monitoring
Construction and operation	Soil erosion and change in land capability	• Ensure concurrent rehabilitation (backfilling and fertilisation/re-vegetation) is implemented throughout the life of the mine	• ECO& project Manager	Monthly reporting

Activity	Associated Potential Impacts	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
Construction and operation	Safety and hazards	• Maintain an incident register for any accidents or safety incidences.	• ECO & Project Manager	Monthly reporting
Construction and operation	Surface water contamination	• The monitoring of river reaches associated with mining right areas should be completed	ECO & Competent Authority	• weekly monitoring during construction & 3 months post construction • Monthly monitoring after construction phase • quarterly internal reports • Annual reporting to the Competent authority
Operation	Ground water Contamination	• Use a SANAS approved laboratory for analysis	ECO & Competent Authority	• Monthly monitoring • quarterly internal reports • Annual reporting to the Competent authority

Activity	Associated Potential Impacts	Functional Requirements for Monitoring	Roles and Responsibilities	Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions
• Rehabilitating the camp site, rehabilitation of the disturbed and contaminated areas • Re-vegetation Removal of all mobile infrastructure on site	• Recovery/ restoration of natural habitat • Dust dispersal	Inspection of rehabilitation on site and performance assessment of the rehabilitation plan	• ECO & Competent Authority • Safety officer /Occupational hygienist	• Annual inspection and reporting • Monthly monitoring and annual reporting of dust fall.

43. INDICATE THE FREQUENCY OF THE SUBMISSION OF THE PERFORMANCE ASSESSMENT REPORT.

The Environmental Performance Assessment (EPA) should be conducted in terms of Regulations 34 of National Environmental Management Act (NEMA), November 2014 Regulations as amended in April 2017, which requires that an Integrated Environmental Authorisation Holder conducts a performance assessment of the Environmental Management Programme (EMPr). The mine must undertake the following audits:

- Annual external/independent audit (compulsory)
- Quarterly external audits (voluntary)

44. ENVIRONMENTAL AWARENESS PLAN

An environmental control officer will undertake awareness of different environmental aspect and will train the employees on how to deal with emergency situations and how to remediate such emergencies.

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

The following communication strategies will be used to inform and equip the employees of environmental risks and important environmental information .

- Awareness campaigns by the ECO.
- Induction to the new and returning employees (and visitors)
- Training of the relevant staff. E.g., the spill kit use training offered to the workshop staff
- Monthly topic posters pasted around the mine and sent through the emails.

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

All employees must be provided with environmental awareness training to inform them of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. This should be in conjunction with the implementation of the EMPr.

45. SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

(Among others, confirm that the financial provision will be reviewed annually).

SA Lithium (Pty) will update and review the quantum of the financial provision on an annual basis. In addition, formal monitoring and performance assessment reviews of compliance will be undertaken annually.

46. UNDERTAKING

The EAP herewith confirms

- the correctness of the information provided in the reports ☒
- the inclusion of comments and inputs from stakeholders and I&APs ; ☒
- the inclusion of inputs and recommendations from the specialist reports where relevant; ☒
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; ☒

-END-

APPENDICES

Here is the list of the appendices attached to this report