Gazania Investments 242 (Pty) Ltd

Updated Environmental Management Plan (EMP) Report to Support the Application for Amendment of Environmental Clearance Certificate (ECC) for Mining License (ML) No. 215 and all Supporting Infrastructures, Aukam Farm No. 104, Bethanie District,
//KARAS REGION, SOUTHERN NAMIBIA

FEBRUARY 2020

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WINDHOEK, NAMIBIA**

Prepared By

Risk-Based Solutions (RBS) CC

The Consulting Arm of Foresight Group Namibia (PTY) LTD

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STATEMENT OF QUALIFICATIONS / SUMMARY CV /PROFILE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) DR SINDILA MWIYA

Dr Sindila Mwiya has more than eighteen (18) years of practical field-based technical industry experience in Environmental Assessment (SEA, EIA, EMP, EMS), Energy (Renewable and Non-renewable energy sources), onshore and offshore resources (minerals, oil, gas and water) exploration / prospecting, operation and utilisation, covering general and specialist technical exploration and recovery support, Health, Safety and Environment (HSE) permitting for Geophysical Surveys such as 2D, 3D and 4D Seismic, Gravity and Electromagnetic Surveys for mining and petroleum (oil and gas) operations support, through to engineering planning, layout, designing, logistical support, recovery, production / operations, compliance monitoring, rehabilitation, closure and aftercare projects lifecycles. The great array of highly technical specialist knowledge and field-based practical experiences of Dr Sindila Mwiya has now been extended to supporting the development of Environmentally Sustainable, automated / smart and Climate Change resilient homes, towns and cities.

Through his companies, Risk-Based Solutions (RBS) CC and Foresight Group Namibia (FGN) (Pty) Ltd which he founded, he has undertaken more than 200 projects for Local (Namibian), Continental (Africa) and International (Global) based clients. He has worked and continue to work for Global, Continental and Namibian based reputable resources (petroleum and mining / minerals) and energy companies such as EMGS (UK/ Norway), CGG (UK/ France/Namibia), BW Offshore (Norway/Singapore /Namibia), Shell Namibia B. V. Limited (Namibia/ the Netherlands), Tullow Oil (UK/Namibia), Debmarine (DBMN) (Namibia), Reconnaissance Energy Africa Ltd (ReconAfrica) (UK/Canada/Namibia), Osino Resource Corporation (Canada/Germany/Namibia), Gazania Investment 242 Corporation (Canada/ Australia/ Namibia), Petrobras Oil and Gas (Brazil) / BP (UK)/ Namibia, REPSOL (Spain/ Namibia), ACREP (Namibia/Angola), Preview Energy Resources (UK), HRT Africa (Brazil / USA/ Namibia), Chariot Oil and Gas Exploration (UK/ Namibia), NABIRM (USA/ Namibia), Serica Energy (UK/ Namibia), Eco (Atlantic) Oil and Gas (Canada / USA/ Namibia), ION GeoVentures (USA), PGS UK Exploration (UK), TGS-Nopec (UK), Maurel & Prom (France/ Namibia), GeoPartners (UK), PetroSA Equatorial Guinea (South Africa / Equatorial Guinea/ Namibia), Preview Energy Resources (Namibia / UK), Sintezneftegaz Namibia Ltd (Russia/ Namibia), INA Namibia (INA INDUSTRIJA NAFTE d.d) (Croatia/ Namibia), Namibia Underwater Technologies (NUTAM) (South Africa/Namibia), InnoSun Holdings (Pty) Ltd and all its subsidiary renewable energy companies and projects in Namibia (Namibia / France), HopSol (Namibia/Switzerland), Momentous Solar One (Pty) Ltd (Namibia / Canada), OLC Northern Sun Energy (Pty) Ltd (Namibia) and more than 100 local companies. Dr Sindila Mwiya is highly qualified with extensive practical field-based experience in petroleum, mining, renewable energy (Solar, Wind, Biomass, Geothermal and Hydropower), Non Renewable energy (Coal, Petroleum, and Natural Gas), applied environmental assessment, management and monitoring (Scoping, EIA, EMP, EMP, EMS) and overall industry specific HSE, cleaner production programmes, Geoenvironmental, geological and geotechnical engineering specialist fields.

Dr Sindila Mwiya has undertaken and continue to undertake and manage high value projects on behalf of global and local resources and energy companies. Currently, (2020-2023) Dr Sindila Mwiya is responsible for permitting planning through to operational and completion compliance monitoring, HSE and engineering technical support for multiple major upstream onshore and offshore petroleum, minerals and mining projects, Solar and Wind Energy Projects, manufacturing and environmentally sustainable, automated / smart and Climate Change resilient homes developments in different parts of the World including Namibia. Currently, Dr Sindila Mwiya is developing a 16 Ha commercial and residential Mwale Mwiya Park in the Town of Katima Mulilo, Zambezi Region, Namibia as one of first advanced Environmentally Sustainable, automated / smart and Climate Change resilient development in Namibia. He continue to worked as an International Resources Consultant, national Environmental Assessment Practitioner (EAP) / Environmentally Sustainable, automated / smart and Climate Change resilient homes developer, Engineering / Technical Consultant (RBS / FGN), Project Manager, Programme Advisor for the Department of Natural and Applied Sciences, Namibia University of Science and Technology (NUST) and has worked as a Lecturer, University of Namibia (UNAM), External Examiner/ Moderator, NUST, National (Namibia) Technical Advisor (Directorate of Environmental Affairs, Ministry of Environment and Tourism / DANIDA – Cleaner Production Component) and Chief Geologist for Engineering and Environment Division, Geological Survey of Namibia, Ministry of Mines and Energy and a Field-Based Geotechnician (Specialised in Magnetics, Seismic, Gravity and Electromagnetics Exploration and Survey Methods) under the Federal Institute for Geoscience and Natural Resources (BGR) German Mineral Exploration Promotion Project to Namibia, Geophysics Division, Geological Survey of Namibia, Ministry of Mines and Energy.

He has supervised and continue to support a number of MScs and PhDs research programmes and has been a reviewer on international, national and regional researches, plans, programmes and projects with the objective to ensure substantial local skills development, pivotal to the national socioeconomic development through the promotion of sustainable natural resources coexistence, management, development, recovery, utilisation and for development policies, plans, programmes and projects financed by governments, private investors and donor organisations. Since 2006 until 2017, he has provided extensive technical support to the Department of Environmental Affairs (DEA), Ministry of Environment and Tourism (MET) through GIZ in the preparation and amendments of the Namibian Environmental Management Act, 2007, (Act No. 7 of 2007), new Strategic Environmental Assessment (SEA) Regulations, preparation of the updated Environmental Impact Assessment (EIA) Regulations as well as the preparation of the new SEA and EIA Guidelines and Procedures all aimed at promoting effective environmental assessment and management practices in Namibia.

Among his academic achievements, Dr Sindila Mwiya is a holder of a PhD (Engineering Geology/Geotechnical / Geoenvironmental / Environmental Engineering and Artificial Intelligence) – Research Thesis: Development of a Knowledge-Based System Methodology (KBSM) for the Design of Solid Waste Disposal Sites in Arid and Semiarid Environments, MPhil/PG Cert and BEng (Hons) (Engineering Geology and Geotechnics) qualifications from the University of Portsmouth, School of Earth and Environmental Sciences, United Kingdom. During the 2004 Namibia National Science Awards, organised by the Namibian Ministry of Education, and held in Windhoek, Dr Sindila Mwiya was awarded the Geologist of the Year for 2004, in the professional category. Furthermore, as part of his professional career recognition, Dr Sindila Mwiya is a life member of the Geological Society of Namibia, Consulting member of the Hydrogeological Society of Namibia and a Professional Engineer registered with the Engineering Council of Namibia.

WINDHOEK NAMIBIA, FEBRUARY 2020

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EXECUTIVE SUMMARY

1. Introduction

Gazania Investment Two Hundred and Forty-Two (242) (Pty) Ltd (the Proponent) has applied to the Competent Authority, the Ministry of Mines and Energy (MME) for Mining License (ML) No. 215 (the Aukam Mine), located on Aukam Farm 104, Bethanie District, in southern Namibia. The Proponent has applied for base and rare metals, industrial mineral and precious metals with special focus of mining graphite. The Aukam mine is a past producer of graphite and has produced about 22,000 tonnes during 30+ years of operation before the mine was abandoned in the 1970s.

Gazania 242 currently holds an Environmental Clearance Certificate (ECC) for mining and exploration activities over the EPL 3895. The current ECC, however, does not reflect the ML 215 on the title. This updated Environmental Management Plan (EMP) report has been prepared in order to support the application for amendment of the ECC by reflect the ML 215 on the tittle of the ECC and provides for the amendments made to the proposed mining operations as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215.

2. The EMP Provisions

The Environmental Management Plan (EMP), described in this updated report, is based on the findings as detailed in the updated EIA. The Proponent must incorporate the EMP in the Environmental Management System (EMS) of the company in line with the Environmental Policy of the company. This updated EMP report incorporates the provisions of the Minerals (Prospecting and Mining) Act (No. 33 of 1992), Environmental Impact Assessment Regulations (2012) and the Environmental Management Act, 2007, (Act No. 7 of 2007) as well as all the key applicable legislative provisions as outlined in the updated EIA Report (Chapter 3).

3. Summary of the EMP

Based on the assessment of both negative and positive impacts undertaken for the proposed remediation and processing of the historic waste dumps (Phase 1) and the development of the in-situ mining operations (Phase 2) as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215, a number of positive and negative impacts have been identified. Mitigation measures for the negative impacts have been proposed and management strategies are provided in this updated EMP Report covering the following development stages:

(i) Preconstruction;

(ii) Construction;

(iii) Operation, ongoing exploration, monitoring and rehabilitation;

(iv) Decommissioning, closure and aftercare.

4. Proponent Roles and Responsibilities

The following are the recommended actions (roles and responsibility) to be implemented by the proponent (Gazania Investment 242 (Pty) Ltd) as a part of the management of the impacts through implementations of this updated EMP Report:

(i) Contract an Environmental Control Officer / External Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project;

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle;

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors;

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identified and contract agreements need to be developed with costing provisions for environmental liabilities;

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer / External Consultant / suitable in-house resource person and to be submitted to the regulators and to end the proposed mine project, and;

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the proponent **(Gazania Investment 242 (Pty) Ltd).** The proponent must provide all appropriate resource requirements for the implementation of this updated EMP as well as an independently managed (not directly controlled by the mining company) funding instrument for mine Closure and Aftercare environmental liabilities.

It is the responsibility of the proponent to make sure that all members of the workforce including contractors and subcontractors are aware of this EMP provisions and its objectives. It is hereby recommended that the proponent take all the necessary steps to implement all the recommendations of this updated EMP for the successful execution of the preconstruction, construction, operational, decommissioning, closure and aftercare activities of the proposed remediation and processing of the historic waste dumps (Phase 1) and the development of the in-situ mining operations (Phase 2) as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215.

1. BACKGROUND

1.1 Introduction

Gazania Investment Two Hundred and Forty-Two (242) (Pty) Ltd (the Proponent) has applied to the Competent Authority, the Ministry of Mines and Energy (MME) for Mining License (ML) No. 215 (the Aukam Mine), located on Aukam Farm 104, Bethanie District, in southern Namibia (Figs 1.1 to 1.3). The Proponent has applied for base and rare metals, industrial mineral and precious metals with special focus of mining graphite.

1.2 Gazania Investment 242 (Pty) Ltd (Proponent)

Gazania Investment 242 (Pty) Ltd (Proponent) is a locally Namibian registered company owned by investment arm Next Graphite Inc and investor and minerals processing technology partner and majority assets holder Gratomic. Gratomic currently owns 63% of the Aukam graphite mine in the ML 215. Gratomic is an advanced materials company focused on mine to market commercialisation of graphite products most notably high value graphene-based components for a range of mass market products. The company is currently collaborating with a leading European manufacturer of graphenes to use Aukam graphite to manufacture graphene products for commercialisation on an industrial scale. The company is listed on the Canadian TSX Venture Exchange under the symbol GRAT.

1.3 Environmental Regulatory Requirements

The proposed mining, minerals processing and ongoing exploration activities in the ML 215 cannot be undertaken without an Environmental Clearance Certificate (ECC) because they are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) among the activities that may have significant negative impacts on the receiving environment.

It's important to note that the Proponent has an ECC dated 6th October 2017 covering the proposed mining and exploration activities and was issued by the Environmental Commissioner following the completion of the EIA and EMP Reports that was prepared by Dr Chris Magombedze (Fig. 1.4).

This updated EIA Reports has been prepared in order to support the application for amendment of the ECC to reflect the ML 215 on the tittle of the ECC and provides for the amendments made to the proposed mining operations divided into Phases and 2 as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215. This updated EIA report is prepared by Risk-Based Solutions (RBS) CC led by Dr Sindila Mwiya Environmental Assessment Practitioner (EAP).

Figure 1.1: Regional location of the ML 215, Aukam Graphite Project, //Karas Region, Southern Namibia.

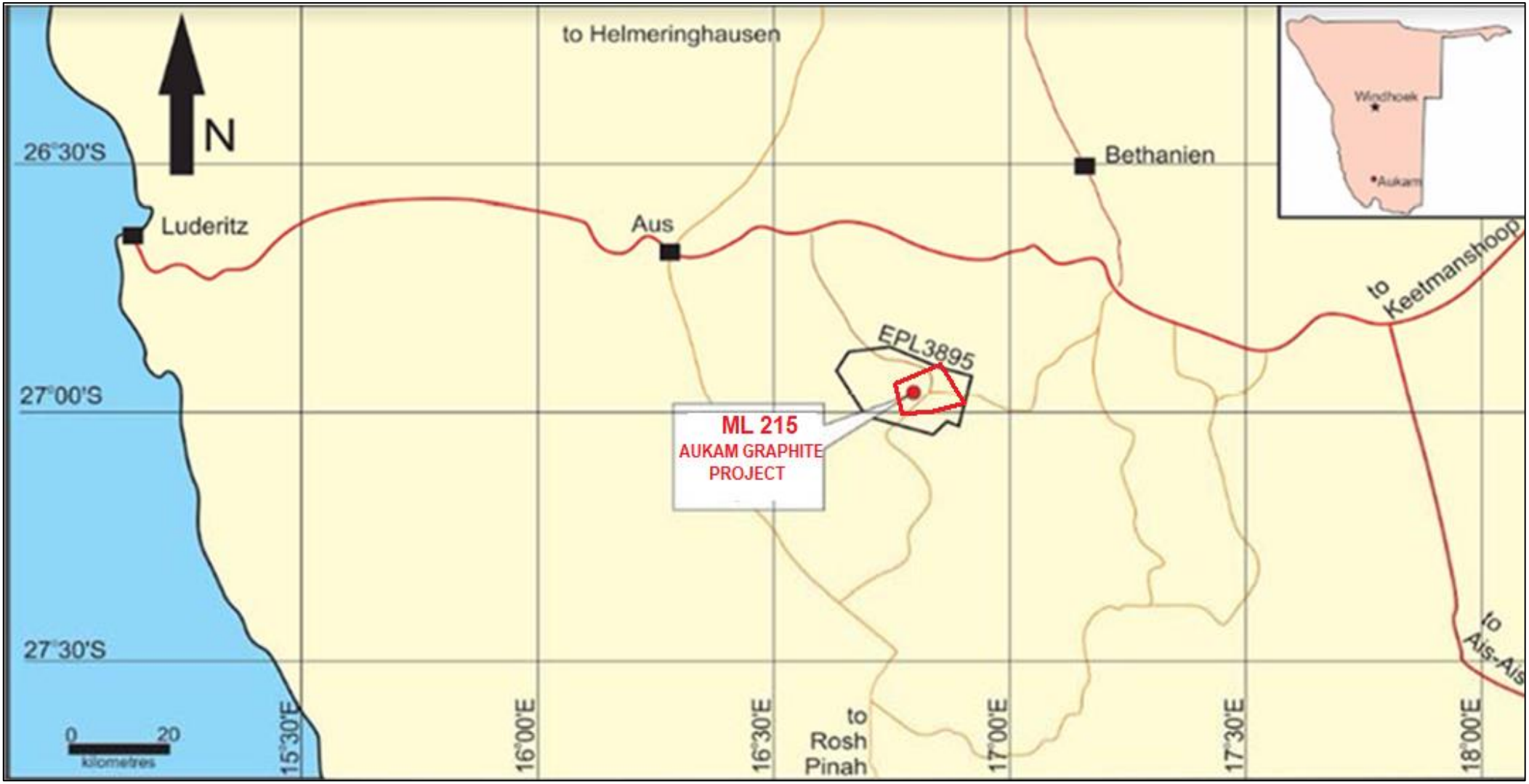

Figure 1.2: Local location of the ML 215, Aukam Graphite Project, //Karas Region, Southern Namibia.

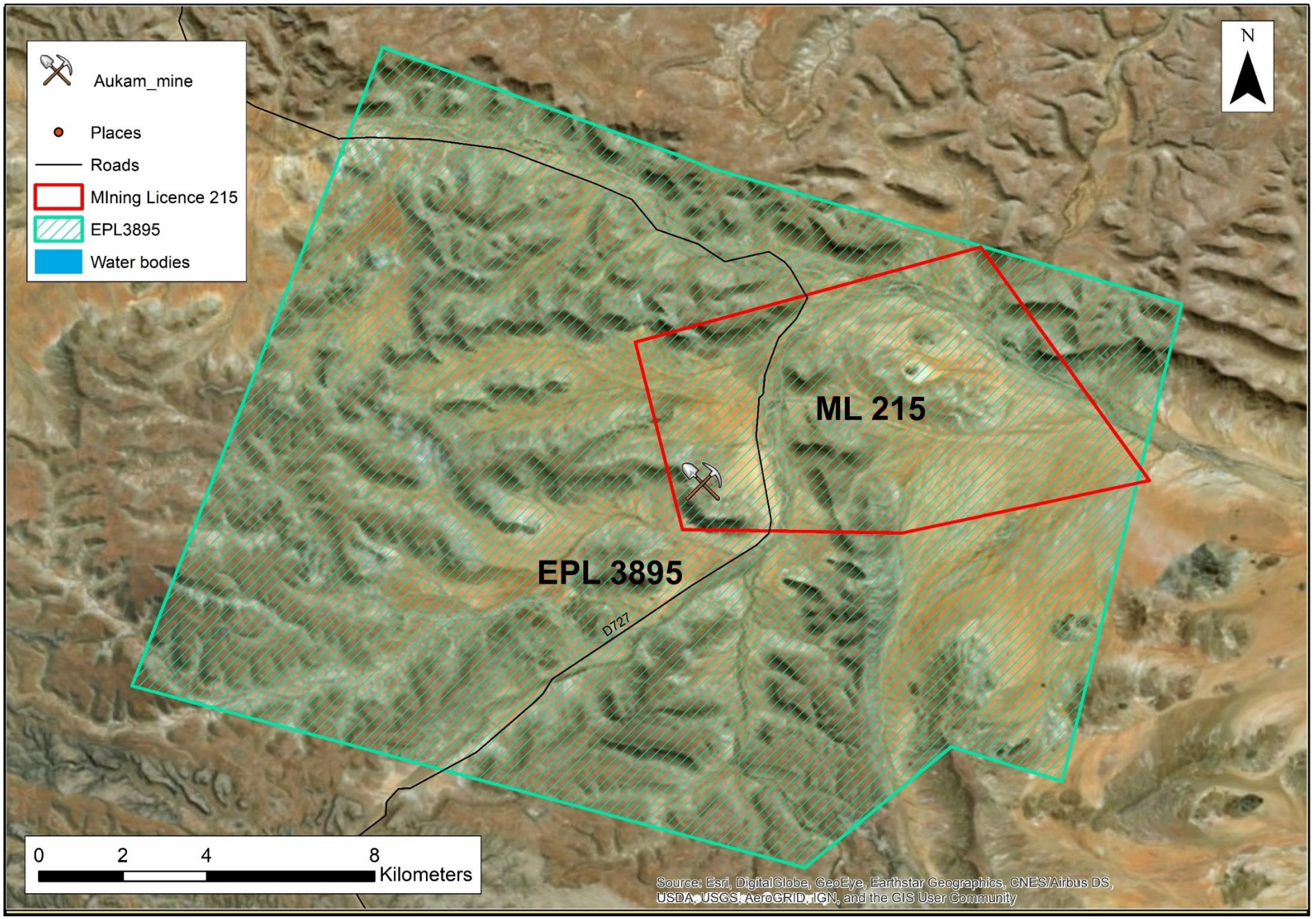

Figure 1.3: Detailed location of the ML 215.

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Windhoek
Namibia

3 October 2017

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

The Managing Director
Gazania 242 (Pty) Ltd
P.O. Box 40806
Windhoek
Namibia

Dear Sir or Madam,

SUBJECT: ENVIRONMENTAL CLEARANCE CERTIFICATE FOR PROPOSED AUKAM GRAPHITE MINING ON EPL 3895, AUKAM FARM 104, //KARAS REGION

The Environmental Scoping Report and Environmental Management Plan submitted are sufficient as it made provisions of the environmental management concerning the project's activities. From this perspective regular environmental monitoring and evaluations should be conducted. Targets for improvements should be established and monitored from time to time.

This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project. From this perspective, I issue this clearance with the following conditions (a) relevant permitting authority involved must be properly consulted and written consent obtained from them; (b) monitoring and evaluations of groundwater quality should be conducted regularly; and(c) any key biodiversity habitats must be protected.

On the basis of the above, this letter serves as an Environmental Clearance Certificate for the project to commence. However, this clearance letter does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from this project activity. Instead, full accountability rests with Gazania 242 (Pty) Ltd and their consultants.

This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office.

Yours sincerely,

P/Bag 13306
Windhoek, Namibia
2017 -10- 06
Office of the Environmental Commissioner

Teofilus Nghitila
ENVIRONMENTAL COMMISSIONER

"Stop the poaching of our rhinos"

All official correspondence must be addressed to the Permanent Secretary

Figure 1.4: Valid copy of the Environmental Clearance Certificate (ECC) dated 6th October 2017 that need to be amended to include the ML 2015 in the title issued by the Environmental Commissioner following the completion of the EIA and Environmental Management Plan (EMP) Report that was prepared by Dr Chris Magombedze covering the proposed exploration and mining operations.

2. OBJECTIVES OF THE EMP

2.1 Summary Objectives

This Environmental Management Plan (EMP) provides a detailed plan of actions required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for the successful implementation of environmental management strategies by the Gazania Investment 242 (Pty) Ltd.

2.2 EMP Management Linkages

The Environmental Management Plan, described in this Report, is based on the findings as outlined in the updated EIA Report. The EMP must be continuously updated during the implementation of the proposed project. Within the framework of the existing Environmental Policy of Gazania Investment 242 (Pty) Ltd, the EMP is to be incorporated in the Environmental Management System (EMS) of the company. This EMP incorporates the Environmental Policy of Gazania Investment 242 (Pty) Ltd, Namibian Environmental regulations and policies as well as international environmental best practices in mining development, operational, rehabilitation, closure and aftercare activities.

2.3 The EMP

An Environmental Management Plan (EMP) is one of the most important outputs of the environmental assessment process and is the synthesis of all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. The aim of the EMP is to assist Gazania Investment 242 (Pty) Ltd (the Proponent), Contractors and Subcontractor to ensure that the day-to-day operations as well as medium to long term strategies are carried out in an environmentally responsible manner, thereby preventing or minimizing the negative effects and maximizing the positive effects of the project-related activities on the natural environment.

It's highly imperative that there is an effective and response organisational structure of Gazania Investment 242 (Pty) Ltd that defines the roles, responsibilities and authority to implement the provisions of this EMP. The summary of such a structure is shown in Fig. 2.1. Provision has also been made, on an ongoing basis, for sufficient management support and human and financial resources. Separate EMPs have been prepared for the project: an EMP for the upgrade and/or construction, including rehabilitation, of access road(s) to and from the proposed mine development; and EMPs for the Construction, Operations and Decommissioning/Closure / Aftercare Phases of the proposed mine development.

The EMPs are presented as comprehensive matrices: for each **Activity/Process** and related **Aspects** (defined by the International Organization for Standardization ISO 14001:2004 as *element of an organization's activities or products or services that can interact with the environment*; environment is defined as *surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation*) and **Impacts** (*any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects*), **Management Actions** required to address the impacts arising directly and indirectly from the various aspects of the proposed mining project, with **Responsible Persons** and **Timing** for each, are listed.

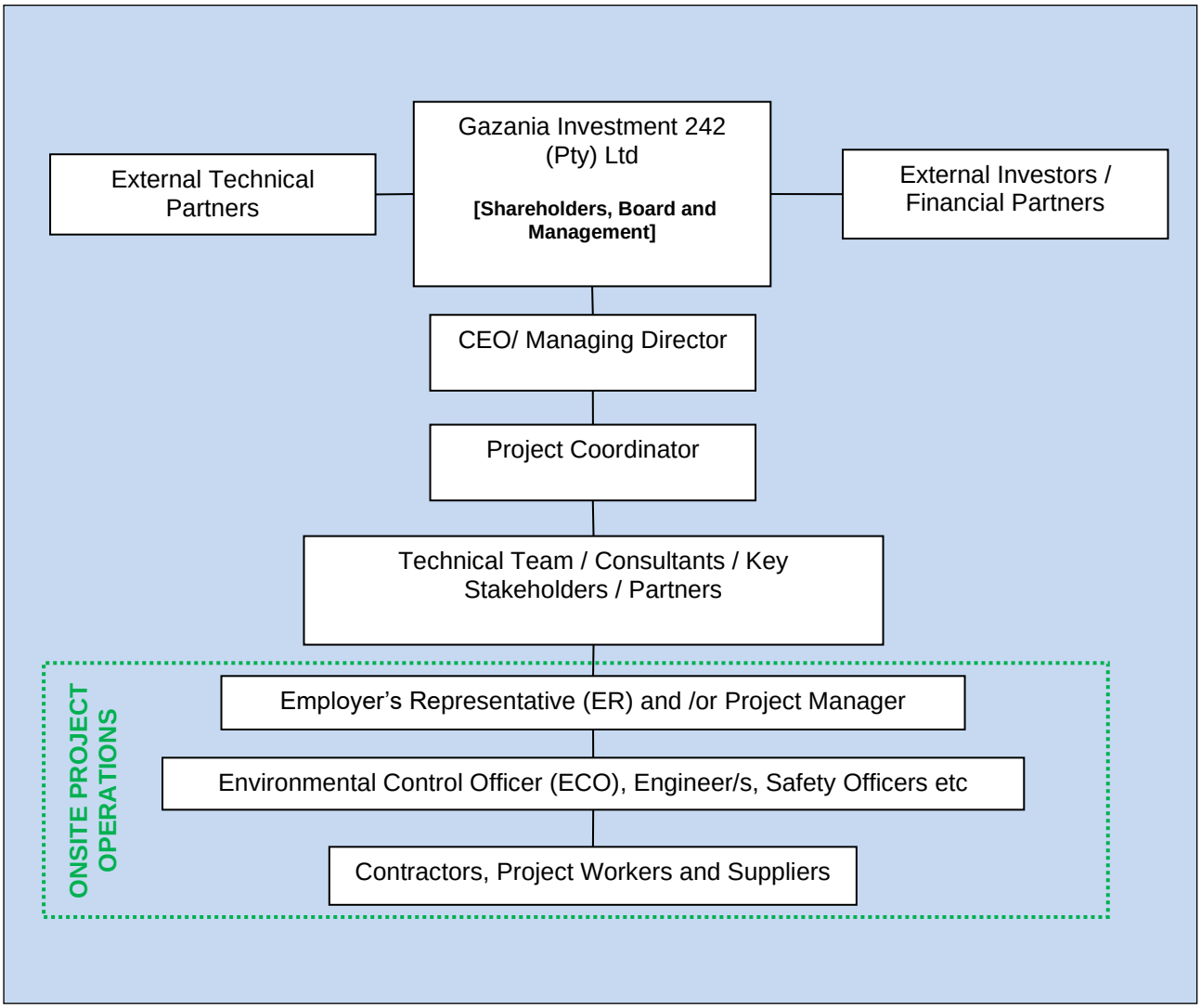

Figure 2.1: Gazania Investment 242 (Pty) Ltd organisational structure for the proposed mine project with respect to the implementation of the EMP.

2.4 Summary of Impacts Assessment Methodology

The following is the summary of the proposed mine developmental stages that have been assessed in this environmental assessment process covering the updated EIA and the development of this updated EMP phases:

(i) Preconstruction;

(ii) Construction;

(iii) Operation, ongoing exploration, monitoring and rehabilitation, and;

(iv) Decommissioning, closure and aftercare.

The detailed outline of all the activities associated with each of the above project developmental stages as sources of potential environmental impacts are outlined in Table 2.1. The impact assessment methodology has adopted a two dimensional matrix approach in predicting the potential impacts of the proposed project on the receiving environment. The two dimensional matrix consisted of the following cross-referencing:

- ❖ The activities linked to the project that are supposed to have an impact on man and the environment;

- ❖ The existing environmental and social conditions that could possibly be affected by the project.

The impact assessment considerations included land disturbance/land use impacts; potential impacts to specially designated areas; impacts to soil, water and air resources; impacts to vegetation, wildlife, wildlife habitat, and sensitive species; visual, cultural, paleontological, socioeconomic and potential impacts from hazardous materials.

2.5 Summary of Impact Assessment Results

In order to determine the likely environmental impacts as well as the overall significant impact of individual sources associated with the proposed Phases 1 and 2 mining, minerals processing, recovery and ongoing exploration operations within the ML 215 (Table 2.1), an impact identification and assessment process was undertaken as detailed in the updated EIA report.

The results of the overall impacts and key issues associated with the proposed activities / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Table 2.2.

The updated EIA significant impact identification and assessment processes focused on the environment interaction approach with respect to the proposed project activities, the pathways and the likely targets or receptor. In this process, components of the project activities that are likely to impact the natural environment (physical, biological and socioeconomic) were broken down into individual development stages and activities.

The results of the overall significant impacts assessment associated with the proposed activities / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Table 2.3. The summary of key potential environmental concerns expected during the preconstruction, construction, operation, ongoing exploration, monitoring and rehabilitation, decommissioning, closure and aftercare stages are outlined in Table 2.4.

Table 2.1: Outline of proposed project developmental stages and all the associated activities as sources of potential environmental impacts.

PROJECT PHASE	DEVELOPMENT ACTIVITIES FOR EACH PHASE	
PRECONSTRUCTION	1. General site clearing of the pit area, administration block, waste rock, tailings, supporting infrastructure (Office blocks, water and electricity other site infrastructure	
	2. Access roads clearing	
	3. Top soil removal and storage	
	4. Development of the temporary construction camp	
	5. Installation of campsites, offices, workshops, storage facilities.	
CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Production plant and ore handling infrastructure including foundation and the entire structures
		3. Tailing disposal facilities
		4. Waste rock stockpiles
		5. Water supply systems
		6. Power infrastructure, including powerline and distribution systems
		7. Administration blocks and warehouses
		8. Fuel supply and storage
		9. Workshop and equipment maintenance facilities
		10. Explosives storage facility / bunker
		11. Wastewater treatment systems
		12. Solid waste disposal storage / transfer facility
		13. Storm water management around the plant, waste rock and tailings
		14. Testing the ore handling and processing facilities
	MINE WORKINGS	1. Excavation, drilling and blasting as maybe required to create direct access to the ore body
		2. Actual pit / shaft excavation and stripping of the overburden to create direct access to the ore body
		3. Ore production for test mining operations
		4. Test mining and commissioning
OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)	
	2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate	
	3. Storage and transportation of recovered minerals for export through the Port of Lüderitz	
	4. Old and new tailings and waste rock (Phases 1 and 2)	
	5. Ongoing exploration support	
	6. Ongoing rehabilitation and maintenance	
	7. Waste water and sludge disposal	
	8. Mining, processing and minerals recovery impacts on water	
	9. Mining, processing and minerals recovery impacts on the overall receiving environment	
DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	
	2. Closure of open pits / shafts	
	3. Closure of solid waste piles	
	4. Backfill waste dump sites	
	5. Closure of storage sites	
	6. Decommissioning of water and electricity infrastructure	
	7. Overall land reclamation	
	8. Restoration of internal roads	
	9. Revegetation and aftercare as may be required	

Table 2.2: Matrix impact assessment results of the proposed Phases 1 and 2 mining, exploration and supporting infrastructure activities.

SCALE	DESCRIPTION
0	no observable effect
1	low effect
2	tolerable effect
3	medium high effect
4	high effect
5	very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE		ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Socioeconomic, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	BIOLOGICAL ENVIRONMENT: Fauna	BIOLOGICAL ENVIRONMENT: Habitat	BIOLOGICAL ENVIRONMENT: Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION		1. General site clearing of the pit area, administration block, waste rock, tailings, water and electricity other supporting infrastructure	3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Access roads clearing / upgrading	3 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Top soil removal and storage for all operations	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. Development of the temporary construction camp	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			5. Installation of campsites, offices, workshops, storage.	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Processing plant infrastructure including foundation and the entire structures	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			3. New tailing disposal facilities	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			4. New waste rock stockpiles	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			5. Water supply systems	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			6. Powerline and local power infrastructure, including power distribution systems	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			7. Administration blocks and warehouses	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			8. Fuel supply and storage facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			9. Workshop and equipment maintenance	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			10. Chemicals and explosives storage facility	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			11. Wastewater treatment systems	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			12. Solid waste storage / transfer facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			13. Storm water management around the plant, waste rock and tailings	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			14. Testing the mining and processing facilities	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
		MINE WORKINGS	1. Excavation (Phase 1), drilling and blasting (Phase 2) to create access to the ore body	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			2. Pit excavation and stripping of the overburden to access the ore body	3 (-)	1 (-)	1 (-)	3 (-)	3 (-)	3 (-)	3 (-)
			3. Ore production for test mining operations	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)
			4. Test mining process	3 (-)	1 (-)	1 (-)	2(-)	2(-)	2(-)	2(-)

Table 2.2: *Cont.*

SCALE		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT – Natural Environment – Air, Noise, Water, Green Space	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT – Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	PHYSICAL AND SOCIOECONOMIC ENVIRONMENT – Socioeconomic, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT – Flora	BIOLOGICAL ENVIRONMENT – Fauna	BIOLOGICAL ENVIRONMENT – Habitat	BIOLOGICAL ENVIRONMENT – Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)	3(-)	0(-)	3(-)	1(-)	2(-)	1(-)	1(-)
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate	3(-)	1(-)	1(-)	1(-)	2(-)	1(-)	1(-)
		3. Storage and transportation of recovered minerals for export through the Port of Lüderitz	3(-)	1(-)	3(-)	1(-)	2(-)	1(-)	1(-)
		4. Old and new tailings and waste rock (Phases 1 and 2)	3(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		5. Ongoing exploration support	3(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		6. Ongoing rehabilitation and maintenance	2(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		7. Waste water and sludge disposal	2(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		8. Mining, processing and minerals recovery impacts on water	1(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
		9. Mining, processing and minerals recovery impacts on the overall receiving environment	1(-)	0(-)	0(-)	1(-)	2(-)	1(-)	1(-)
	DECOMMISSIONING CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	0(-)	0(-)	4 (+)	2(-)	2(-)	2(-)	2(-)
		2. Closure of open pits / shafts	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		3. Closure of solid waste piles	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		4. Backfill waste dump sites	3(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		5. Closure of storage sites	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		6. Decommissioning of water and electricity infrastructure	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		7. Overall land reclamation	2(+)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		8. Restoration of internal roads	2(-)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)
		9. Revegetation and aftercare as may be required	1(+)	0(-)	3 (+)	2(-)	2(-)	2(-)	2(-)

Table 2.3: Significant matrix impact assessment results for Phases 1 and 2 mining, exploration and supporting infrastructure activities.

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE		ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	PRE-CONSTRUCTION		1. General site clearing of the pit area, administration block, waste rock, tailings, water and electricity other supporting infrastructure	B4 (-)	A1(-)	D4 (+)	B3(-)	B3(-)	B3(-)	B3(-)
			2. Access roads clearing / upgrading	B4 (-)	A1(-)	D4 (+)	B3(-)	B3(-)	B3(-)	B3(-)
			3. Top soil removal and storage for all operations	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4. Development of the temporary construction camp	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			5. Installation of campsites, offices, workshops, storage.	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
	CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2. Processing plant infrastructure including foundation and the entire structures	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3. New tailing disposal facilities	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4. New waste rock stockpiles	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5. Water supply systems	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			6. Powerline and local power infrastructure, including power distribution systems	B4 (-)	A1(-)	A1(-)	B4 (-)	B4 (-)	B4 (-)	B4 (-)
			7. Administration blocks and warehouses	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			8. Fuel supply and storage facilities	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			9. Workshop and equipment maintenance	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			10. Chemicals and explosives storage facility	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			11. Wastewater treatment systems	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			12. Solid waste storage / transfer facilities	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			13. Storm water management around the plant, waste rock and tailings	B4 (-)	A1(-)	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
			14. Testing the mining and processing facilities	B4 (-)	A1	A1(-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		MINE WORKINGS	1. Excavation (Phase 1), drilling and blasting (Phase 2) to create access to the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			2. Pit excavation and stripping of the overburden to access the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			3. Ore production for test mining operations	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			4. Test mining process	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)
			5. Excavation (Phase 1), drilling and blasting (Phase 2) to create access to the ore body	B4 (-)	A1(-)	A1(-)	B3(-)	B3(-)	B3(-)	B3(-)

Table 2.3: *Cont.*

IMPACT SEVERITY	IMPACT LIKELIHOOD: Extremely Unlikely [0]	Unlikely [1]	Low Likelihood [2]	Medium Likelihood [3]	High Likelihood [4]
Slight [A]	[A0]	[A1]	[A2]	[A3]	[A4]
Low [B]	[B0]	[B1]	[B2]	[B3]	[B4]
Medium [C]	[C0]	[C1]	[C2]	[C3]	[C4]
High [D]	[D0]	[D1]	[D2]	[D3]	[D4]

SOURCES OF POTENTIAL IMPACT	PROJECT DEVELOPMENT PHASE	ACTIVITIES	RECEPTORS / TARGETS THAT MAY BE IMPACTED: PHYSICAL AND SOCIOECONOMIC ENVIRONMENT: Natural Environment – Air, Noise, Water, Green Space	Built Environment – Houses, Roads, Transport Systems, Buildings, Infrastructure	Socioeconomic, Archaeological and Cultural Resources	BIOLOGICAL ENVIRONMENT: Flora	Fauna	Habitat	Ecosystem - Services, function, use values and non-use
	OPERATION, ONGOING MONITORING AND REHABILITATION	1. Mining operations (actual mining operations including excavation, drilling, blasting as maybe required)	C3(-)	A1(-)	D4 (+)	A1(-)	B4 (-)	A1(-)	A1(-)
		2. Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate	C3(-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		3. Storage and transportation of recovered minerals for export through the Port of Lüderitz	C3(-)	A1(-)	D4 (+)	A1(-)	B4 (-)	A1(-)	A1(-)
		4. Old and new tailings and waste rock (Phases 1 and 2)	C3(-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		5. Ongoing exploration support	C3(-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		6. Ongoing rehabilitation and maintenance	B2 (-)	A1(-)	A1(-)	A1(-)	B4 (-)	A1(-)	A1(-)
		7. Waste water and sludge disposal	B2 (-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
		8. Mining, processing and minerals recovery impacts on water	A1(-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
		9. Mining, processing and minerals recovery impacts on the overall receiving environment	A1(-)	A1(-)	A1(-)	A1(-)	B2 (-)	A1(-)	A1(-)
	CLOSURE AND AFTERCARE	1. Implementation of sustainable socioeconomic plan	A1(-)	A1(-)	D4 (+)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		2. Closure of open pits / shafts	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		3. Closure of solid waste piles	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		4. Backfill waste dump sites	C3(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		5. Closure of storage sites	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		6. Decommissioning of water and electricity infrastructure	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		7. Overall land reclamation	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		8. Restoration of internal roads	B4 (-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)
		9. Revegetation and aftercare as may be required	A1(-)	A1(-)	B4 (-)	B2 (-)	B2 (-)	B2 (-)	B2 (-)

Table 2.4: Summary of the selected key potential environmental impacts likely to be associated with proposed Phases 1 and 2 mining, minerals processing, recovery and ongoing exploration operations in the ML 215.

ENVIRONMENTAL IMPACT OR ISSUE	SIGNIFICANCE RATING BEFORE & AFTER MITIGATION
1. Impacts on air quality: dust (PM_{10} & dust outfall including metals)	Medium (-) Low with mitigation
2. Impacts on soil / habitats/ ecosystem	Medium (-) Low with mitigation
3. Impacts on flora / habitats/ ecosystem	Low (-) Can be avoided
4. Impacts on invertebrates/ habitats/ ecosystem	Medium (-) Probably reducible
5. Impacts on reptiles/ habitats/ ecosystem	Medium (-) Probably reducible
6. Impacts on birds/ habitats/ ecosystem	Medium (-) Low with mitigation
7. Impacts on mammals/ habitats/ ecosystem	Medium (-) Low with mitigation
8. Impact on groundwater levels / resource	Low (-)
9. Impacts on groundwater quality (offices, ablutions, waste, refuelling)	Medium (-) Low if mitigated
10. Impacts on groundwater quality (from tailings)	Medium (-) Low if mitigated
11. Impacts on groundwater quality (from rock waste drainage)	Medium (-) Low if mitigated
12. Impacts on volumes of surface runoff	Low (-)
13. Impacts on surface water quality	Medium (-) Low if mitigated
14. Impacts of solid and liquid waste	Medium (-) Low if fully compliant
15. Electricity demand	Low (-) but may be further reduced
16. Impacts of power line	Low (-) but may be further reduced
17. Visual impacts and lighting	Medium (-) Low with mitigation
18. Impacts of water demand	Medium (-)
19. Impacts of water supply pipeline	Low (-) but may be further reduced
20. Road traffic and Lüderitz Town and Port	Low (-)
21. Mine rehabilitation, closure and aftercare	Medium (+) Must be a condition of approval
22. Local positive socioeconomic including benefits of direct employment	High (+) Medium term
23. Regional (//Karas region) and National (Namibia) overall positive socioeconomic benefits	High (+) Medium term
24. Impacts related to other land users / conflict / coexistence	Medium (-) Reducible to Low
25. Negative Socioeconomic and HIV/AIDS	Low (-)
26. Occupational Health and Safety	Low (-)
27. Emergency Response Plan	Low (-)

3. PRECONSTRUCTION EMP

3.1 Introduction

This section contains the Environmental Management Plan (EMP) for the preconstruction activities. The main activities of the preconstruction stage will be the bush clearing, upgrading and/or construction, including rehabilitation, of access road(s) to and from the proposed mine development areas as well as other mine supporting infrastructures. Table 3.1 outlines the EMP framework for the preconstruction activities of the proposed development summarised as follows:

(i) General site clearing of the pit area, administration block, waste rock, tailings, supporting infrastructure (water and electricity etc.);

(ii) Access roads clearing;

(iii) Top soil removal and storage;

(iv) Development of the temporary construction camp;

(v) Installation of campsites, offices, workshops, storage facilities.

3.2 Roles and Responsibilities

3.2.1 Employer's Representative (ER) / Project Manager

Gazania Investment 242 (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- Act as the Employer's (Gazania Investment 242 (Pty) Ltd) on-site project manager and implementing agent;
- Appoint the Environmental Control Officer (ECO);
- Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP for the preconstruction stage);
- Ensure that all the necessary environmental authorizations and permits have been obtained;
- Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO);
- Should the ER be of the opinion that a serious threat to, or impact on the environment may be caused by the construction operations, he/she may stop work; the Employer must be informed of the reasons for the stoppage as soon as possible;
- The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP;

- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;

- ❖ Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor);

- ❖ Maintain open and direct lines of communication between the Employer, ECO, Contractor and Interested and Affected Parties (I&APs) with regards to environmental matters, and;

- ❖ Attend regular site meetings and inspections.

3.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- ❖ Assist the ER in ensuring that the necessary environmental authorizations and permits have been obtained;

- ❖ Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise;

- ❖ Conduct environmental monitoring as per EMP requirements;

- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER;

- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP;

- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP; report any non-compliance(s) to the ER as soon as possible;

- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the construction period; audit reports to be submitted to the ER;

- ❖ Organize for an independent post-construction environmental audit to be carried out;

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document;

- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;

- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic record of the preconstruction and environmental control and rehabilitation process, and a register of all major incidents, and;

- ❖ Attend regular site meetings.

3.2.3 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** include:

- Comply with the relevant legislation and the EMP for the preconstruction activities;
- Preparation and submission to Gazania Investment 242 (Pty) Ltd of the following Management Plans:
    - Environmental Awareness Training and Inductions;
    - Emergency Preparedness and Response
    - Waste Management, and;
    - Health and Safety.
- Ensure adequate environmental awareness training for senior site personnel;
- Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
    - The importance of complying with the relevant Namibian, International and Best Practice Legislation;
    - Roles and Responsibilities, including emergency preparedness;
    - Basic Rules of Conduct (Do's and Don'ts);
    - EMP: aspects, impacts and mitigation;
    - Fines for Failure to Adhere to the EMP, and;
    - Health and Safety Requirements.
- Record keeping of all environmental awareness training and induction presentations, and;
- Attend regular site meetings and environmental inspections.

Table 3.1: Preconstruction EMP.

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
1) Management and Monitoring	• Social and Environmental Performance	• Ensure that all aspects related to the EMP are implemented during the upgrade/construction and rehabilitation of access road(s). • Hold regular site meetings/inspections. Make provision in the minutes of the meetings for reporting on all aspects of the EMP related to the upgrade/construction and rehabilitation of the access road(s); • Adhere to the regulations, rules, procedures, current and future land use of the surrounding area.	• ER / ECO / Contractor	• Ongoing
2) Consultation and Disclosure	• Social and Environmental Performance	• Maintain open and direct lines of communication between the Employer, ECO, Contractor and I&APs with regards to environmental matters. • Consult with project affected communities in a structured and culturally appropriate manner throughout the project process. Consultation should be "free" (*of external manipulation, interference or coercion, and intimidation*), "prior" (*timely disclosure of information*) and "informed" (*relevant, understandable and accessible information*). • Adequately incorporate project affected communities' concerns.	• ER • Gazania Investment 242 (Pty) Ltd / ER	• Ongoing • Ongoing
3) Grievance Mechanism	• Social and Environmental Performance	• Implement a grievance mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance throughout the project life cycle. • Inform the affected communities about the mechanism in the course of the community engagement process; it must be readily accessible to all segments of the affected communities. • Address concerns promptly and transparently and in a culturally appropriate manner.	• Gazania Investment 242 (Pty) Ltd / ER	• Ongoing
4) Training including awareness and inductions	• Social and Environmental Performance	• Train employees, contractors and Subcontractors in matters related to the project's social and environmental performance, Namibia's regulatory requirements • Ensure adequate environmental awareness training for all senior site personnel. • Give environmental induction presentations to all site personnel prior to work commencement.	• Gazania Investment 242 (Pty) Ltd • Contractor	• Ongoing • Pre- and during road upgrade/construction and rehabilitation

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
5) Labour and Working Conditions	• Social and Environmental Performance	• Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed. • Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour. • Promote safe and healthy working conditions and the protection and promotion of worker health. • Prepare a Human Resources Policy and document and communicate the Working Conditions and Terms of Employment. • Respect Collective Agreements and the right of workers to organize and bargain collectively. • Prepare a Retrenchment Plan. • Implement a Grievance Mechanism.	• Gazania Investment 242 (Pty) Ltd	• Ongoing
6) Occupational Health and Safety	• Social and Environmental Performance	• Prepare and submit an Emergency Preparedness and Response Plan. • Adhere to all Namibian Health and Safety Regulations under the Labour Act and Mines Safety Regulations. • Occupational Health and Safety Training to be provided to all employees. • Ensure that qualified first aid can be provided at all times. • Provide and ensure the active use of Personal Protective Equipment (PPE).	• Contractor	• Pre- road upgrade/construction • Ongoing
7) Community Health and Safety	• Social and Environmental Performance	• Prevent communicable disease (e.g sexually transmitted diseases (STDs) such as HIV/AIDS transmission): provide awareness, surveillance and active screening and treatment of employees; prevent illness among employees in local communities (through health awareness and education initiatives); ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers; and promote immunization.	• Gazania Investment 242 (Pty) Ltd / Contractor	• Ongoing

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
8) Construction camp assumed to be a (tented) temporary camp and other supporting infrastructure. Adhere to the regulations, rules, procedures, current and future land use plans of the local area.	• Disturbance of fauna and flora and habitat alteration	• The planning and design to ensure minimum impact to the environment. • No trees or natural vegetation may be removed for the making of fires. • No animal may be injured, fed, trapped, hunted or harmed in any way. • No off-road driving will be allowed • Speed limit of not more than 60 km / h. • No trespassing on adjoining properties is allowed and no livestock, game or vegetation are to be interfered with.	• Gazania Investment 242 (Pty) Ltd / ER • Contractor	• Pre-construction • Ongoing
	• Pollution of biophysical environment (air, soil and water)	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Vehicle maintenance/servicing/washing not to be allowed anywhere on site/at the camp. • Portable toilets to be provided and used at the camp. • Sanitary wastewater to be released into a French drain system. • Use bio-degradable detergents on site. • Enforce proper waste (hazardous and non-hazardous) management practices (as per Waste Management Plan) – waste and litter to be disposed of in scavenger and weatherproof bins and the refuse to be collected by the contractor and disposed off an approved waste disposal site at least once a week or as may be required.	• Contractor	• Ongoing
	• Occupational Health and Safety	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Ensure that employees are trained in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times. • Comply with all electricity safety, generation and supply regulations. • Supply potable water for human consumption and other domestic uses; conduct chemical testing of water samples on a monthly basis (if applicable). • Make suitable arrangements, as far as practicable, for the maintenance of health, the prevention and overcoming of outbreaks of disease and of adequate first aid services. • Ensure that security arrangements are in place at all times.	• Contractor	• Ongoing

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
9) Clearing of areas for road upgrade /construction and always adhere to the regulations, rules, procedures, current and future land use plans of the local area.	• Disturbance of fauna and flora and habitat alteration	• Restrict activities to previously demarcated areas (borrow pits, haul and access roads (20 m from the centre line of the road), construction camp / supporting infrastructure, etc.); all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land. • Minimize the removal of native plant species; no vegetation may be removed/damaged without direct instructions. • No off-road driving will be allowed. • No animal may be injured, fed, trapped, hunted or harmed in any way.	• Contractor	• Pre- and during road upgrade/construction • Ongoing
	• Soil erosion	• Sediment mobilization and transport: reduce or prevent soil erosion (schedule activities to avoid heavy rainfall / strong winds periods; contour and minimize length and steepness of slopes; mulching to stabilize exposed areas; re-vegetate areas promptly; and design channels and ditches for post-construction flow). • Road design: limit access road gradients to reduce run-off induced erosion; provide adequate road drainage based on road width, surface material, compaction and maintenance. • Structural (slope) stability: provide effective short-term measures for slope stabilization, sediment and subsidence control until long-term measures (during operations) can be implemented; provide adequate drainage systems to minimize and control infiltration.	• Engineer / Contractor	• Pre- and during road upgrade/construction and rehabilitation
	• Possible loss of the seed bank in the topsoil	• The upper layer of soil (10-20 cm), where alluvial, to be stripped and stockpiled separately (1-2 m high piles to allow for proper aeration). Install drainage to protect the topsoil pile from (water) erosion and cover it to protect it from (wind) erosion.	• Contractor	• Pre- and during road upgrade/construction
10) Construction material borrow pit siting.	• Visual, pollution (traffic, noise and air), and land use	• Consider, in addition to material quality and quantity, the visual impact, potential traffic, noise and air pollution, and the potential loss of arable land when borrow pits are sited. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Engineer / Contractor	• Pre- and during road upgrade/construction

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
11) Borrow pit management	• Disturbance of fauna and flora and habitat alteration	• Limit the number of borrow pits as far as possible. • The progression of stripping and excavation to allow for rehabilitation once the areas have been fully utilized.	• Engineer / Contractor	• Pre- and during road upgrade/construction
	• Possible loss of the seed bank in the topsoil	• The upper layer of soil (10-20 cm), where alluvial, to be stripped and stockpiled separately (1-2 m high piles to allow for proper aeration). Install drainage to protect the topsoil pile from (water) erosion and cover it to protect it from (wind) erosion.	• Contractor	• Pre- and during road upgrade/construction
	• Occupational and Community Safety	• Cut slopes not to be steeper than 30 degrees. • No under-cutting of the sides to be allowed. • Undertake excavations in a safe manner and in compliance with the relevant safety regulations (Labour Act and Mine Safety Regulations).	• Contractor	• Pre- and during road upgrade/construction
	• Social and Environmental Performance	• Cut slopes not to be steeper than 30 degrees. • Use excess rock spoil to fill borrow pits; material to be neatly shaped and no loose material to be left inside the borrow pits. • No waste are allowed to be dumped in borrow pits. • Evenly spread top soil over the entire area to allow for the re-growth of vegetation. • Replant previously removed native plant species in disturbed areas.	• Contractor	• During road upgrade/construction and rehabilitation
12) Increased traffic, presence and movement of machinery, and the establishment of soil stockpiles.	• Air quality (dust or Particulate Matter (PM) pollution)	• Minimize the area in which the movement of construction machines will take place to reduce the effects of dust pollution / generation. • Minimize dust from material handling sources (e.g. conveyors and bins) by using covers and/or control equipment (e.g. water suppression). • Minimize dust from open area sources, including storage piles, by using control measures (install enclosures and covers, and increase the moisture content). • Avoid the excavation, handling and transport of erodible materials under high wind conditions or when a visible dust plume is present.	• Contractor	• During road upgrade/construction and rehabilitation
13) Increased traffic/vehicle movement.	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).	• Contractor	• Ongoing

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
14) Increased traffic, presence and movement of machinery (exhaust from diesel engines).	• Air quality & Occupational and Community Health and Safety	• Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).	• Contractor	• During road upgrade/construction and rehabilitation
15) Presence of machinery, construction workers, and associated equipment.	• Visual and noise	• Avoid critical habitats (for access roads) through using existing access roads where possible.	• Engineer / Contractor	• Pre- and during construction
16) Increased traffic, movement of machinery.	• Occupational and Community Safety	• Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers; improve driving skills and require licensing of drivers; adopt limits for trip duration; avoid dangerous routes and times of day; and use speed control devices. • Regularly maintain vehicles and use manufacturer approved parts. • Use locally sourced materials (where possible) to minimize transport distances. • Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.	• Contractor	• Pre- and during road upgrade/construction and rehabilitation
17) Use of a Troxler (soil density gauge containing a radioactive source).	• Occupational Health and Safety	• Register the Troxler and apply for a permit from the Ministry of Health & Social Services. • Implement controls and monitoring requirements as per those prescribed by the Ministry of Health & Social Services for the safe handling, transportation and storage of the device.	• Contractor	• Pre- and during road construction
18) Water Management	• Resource use / depletion of natural resources	• Implement a water conservation program, promoting the continuous reduction in water consumption and achieving savings in water pumping, treatment and disposal costs, commensurate with the magnitude and cost of water use.	• ER / Contractor	• Pre- and during road upgrade/construction and rehabilitation

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
19) Hazardous materials management.	• Social and Environmental Performance	• Establish hazardous materials management priorities (based on hazard analysis of risky operations based on Material Safety Data Sheets (MSDS). • Avoid, or minimize the use of hazardous materials. • Prevent uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that may result in fire or explosion. • Make us of engineering controls (containment, automatic alarms and shut-off systems); implement management controls (procedures, inspections and training, communication and drills) to address residual risks not prevented or controlled through engineering controls.	• Contractor	• During road upgrade/construction and rehabilitation
20) Hazardous materials management	• Pollution of biophysical environment (soil and water)	• Implement prevention and control measures for the use, handling and storage of hazardous materials: o Materials transfer: regularly inspect, maintain and repair fittings/pipes/hoses; make use of drip trays/other drip containment measures at connection/possible overflow points; o Overfill protection: use trained filling operators; install gauges on tanks to measure the volume inside; make use of dripless hose connections (vehicle tanks) and fixed connections (storage tanks); use a catch basin/drip tray around the fill pipe to collect spills; o Reaction, fire, and explosion prevention: hazardous materials to be stored in marked containers and separate (from non-hazardous materials); incompatible hazardous materials (acids, bases, flammables, oxidizers, reactive chemicals) to be stored in separate areas and with containment facilities separating material storage; smoking or working with open flames not to be permitted in the presence of these substances; limit access to hazardous waste storage areas and clearly label and demarcate the area; conduct regular inspections of the areas and document the findings; prepare and implement spill response and emergency plans; train employees in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times.	• Contractor	• During road upgrade/construction and rehabilitation

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
Hazardous materials management ***(Cont.)***	•	○ Secondary containment: use bunding (made of impervious, chemically resistant material) that can contain the larger of 110% of the largest tank or 25% of the combined tank volumes for above-ground tanks with a total storage volume equal or greater than 1,000 liters. • Train workers on the correct transfer and handling of fuels and chemicals and the response to spills. • Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills; in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.	• Contractor	• During road upgrade/construction and rehabilitation
21) Hazardous materials management.	• Occupational Health and Safety	• Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these. • Provide and ensure the active use of Personal Protective Equipment (PPE).	• Contractor	• During road upgrade/construction and rehabilitation
22) Waste management: solid.	• Air quality	• Avoid the open burning of waste (whether hazardous, or non-hazardous).	• Contractor	• Pre- and during road upgrade/construction and rehabilitation
23) Waste management: non-hazardous and hazardous.	• Pollution of biophysical environment	• Prepare and submit a Waste Management Plan before construction commences. The generation of waste should be avoided or minimized as far as practicable; where it cannot be avoided, but has been minimized, waste should be recovered and reused; where waste cannot be recovered/reused, it should be treated, destroyed and disposed of in an environmentally sound manner. • Institute and maintain good housekeeping and operating practices; littering is not allowed. • Non-hazardous and hazardous waste to be collected and stored separately: • Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect and recycle batteries and print cartridges. The remainder to be transported to a recognized hazardous waste disposal site, with prior permission from the operator / owner.	• Contractor	• Pre- road upgrade/construction

Table 3.1: *Cont.*

ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
24) Waste management: sanitary.	• Pollution of biophysical environment	• Portable toilets (1 toilet per 30 employees; preferred 1:15) to be provided and transported along the route; contents to be collected by an approved contractor and disposed of at an approved sewage site. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Contractor	• During road upgrade/construction and rehabilitation
25) Waste water management - waste water treatment.	• Pollution of biophysical environment	• Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or storm water to land conform to the regulatory requirements. Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Contractor / ER	• Pre- and during road upgrade/construction and rehabilitation
26) Waste water management - storm water management	• Soil erosion	• Regular inspection and maintenance of permanent erosion and runoff control features.	• Contractor / ER / ECO	• Ongoing
27) Rehabilitation.	• Social and Environmental Performance	• Remove all equipment, waste, temporary structures, etc. from the camp and work sites. • Reshape all disturbed areas (including stockpiles, borrow pits, and temporary detours and turnouts) to their original contours. • Cover disturbed areas with previously collected topsoil and spread evenly. • Manually rip disturbed areas, where compaction has taken place, and cover the areas with previously collected topsoil. • Replant any previously removed native plant species in disturbed areas. • Adhere to the regulations, rules, procedures, current and future regional and local use plans.	• Contractor	• Rehabilitation

4. CONSTRUCTION STAGE

4.1 Introduction

The construction stage of the proposed mine will cover all the activities associated with the mine infrastructures and mine workings as outlined in Table 4.1. The EMP makes provisions for management of a wider array of activities that will be associated with the construction activities of all the required infrastructures for the proposed mine. Table 4.2 outlines the EMP framework for the construction stage of the proposed development. Always, adhere to the regulations, rules, procedures, current and future regional and local land use plans.

Table 4.1: Summary of the construction activities covering mine infrastructures and mine workings.

CONSTRUCTION	MINE SUPPORTING INFRASTRUCTURE	1. Transportation facilities, including access roads to the site and on-site roads
		2. Production plant and ore handling infrastructure including foundation and the entire structures
		3. Tailing disposal facilities
		4. Waste rock stockpiles
		5. Water supply systems
		6. Power infrastructure, including powerline and distribution systems
		7. Administration blocks and warehouses
		8. Fuel supply and storage
		9. Workshop and equipment maintenance facilities
		10. Explosives storage facility / bunker
		11. Wastewater treatment systems
		12. Solid waste disposal storage / transfer facility
		13. Storm water management around the plant, waste rock and tailings
		14. Testing the ore handling and processing facilities
	MINE WORKINGS	1. Excavation, drilling and blasting as maybe required to create direct access to the ore body
		2. Actual pit / shaft excavation and stripping of the overburden to create direct access to the ore body
		3. Ore production for test mining operations
		4. Test mining and commissioning

4.2 Roles and Responsibilities

4.2.1 Employer's Representative (ER

Gazania Investment 242 (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- Act as the Employer's (Gazania Investment 242 (Pty) Ltd on-site project manager and implementing agent;
- Appoint the Environmental Control Officer (ECO);
- Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP for the construction stage;
- Ensure that all the necessary environmental authorizations and permits have been obtained;

- ❖ Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO);
- ❖ Should the ER be of the opinion that a serious threat to, or impact on the environment may be caused by the construction operations, he/she may stop work; the Employer must be informed of the reasons for the stoppage as soon as possible;
- ❖ The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP;
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;
- ❖ Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor);
- ❖ Maintain open and direct lines of communication between the Employer, ECO, Contractor and I&APs with regards to environmental matters, and;
- ❖ Attend regular site meetings and inspections.

4.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- ❖ Assist the ER in ensuring that the necessary environmental authorizations and permits have been obtained;
- ❖ Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise;
- ❖ Conduct environmental monitoring as per EMP requirements;
- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER;
- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP;
- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP; report any non-compliance(s) to the ER as soon as possible;
- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the construction period; audit reports to be submitted to the ER;
- ❖ Organize for an independent post-construction environmental audit to be carried out before operations commence;

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document;
- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;
- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic record of the construction and environmental control and rehabilitation process, and a register of all major incidents, and;
- ❖ Attend regular site meetings.

4.2.3 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** include:

- ❖ Comply with the relevant legislation and the EMP for the Construction Phase of the proposed mine;
- ❖ Preparation and submission to Gazania Investment 242 (Pty) Ltd of the following Management Plans:
    - o Environmental Awareness Training and Inductions;
    - o Emergency Preparedness and Response;
    - o Waste Management;
    - o Health and Safety, and;
    - o Electric and Magnetic Fields (EMF) Safety.
- ❖ Ensure adequate environmental awareness training for senior site personnel;
- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:
    - o The importance of complying with the relevant Namibian, International and Best Practice Legislation;
    - o Roles and Responsibilities, including emergency preparedness;
    - o Basic Rules of Conduct (Do's and Don'ts);
    - o EMP: aspects, impacts and mitigation;
    - o Fines for Failure to Adhere to the EMP, and;
    - o Health and Safety Requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations, and;

- ❖ Attend regular site meetings and environmental inspections.

4.3 Construction Supporting Teams

The construction of the mine infrastructures and mine workings with activities as outlined in Table 4.1 will require an array of specialist teams working very closely with their suppliers and core Gazania Investment 242 (Pty) Ltd onsite operations team. The following is a summary of some of the specialists that will be required during the construction phase as part of the team of contractors and Subcontractors:

- ❖ Mining, Structural, Civil and Mechanical Engineers and Crane Contractors, Electrical Contractors and other specialist teams, each with their respective Sub-contractors and suppliers, would report directly to the Employer's Representative (ER), acting as the onsite Project Manager.

Table 4.2: Environmental Management Plan for construction activities covering mine infrastructures and mine workings.

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
1) All activities	• Management and Monitoring	• Social and Environmental Performance	• Ensure that all aspects related to the EMP are implemented during the construction phase. • Hold regular site meetings/inspections. Make provision in the minutes of the meetings for reporting on all aspects of the EMP related to the construction activities.	• ER / ECO / Contractor	Ongoing throughout the Construction Phase
2) All activities	• Consultation and Disclosure	• Social and Environmental Performance	• Maintain open and direct lines of communication between the Employer (Gazania Investment 242 (Pty) Ltd, ECO, Contractor and I&APs with regards to environmental matters. • Consult with project affected communities in a structured and culturally appropriate manner. Consultation should be "free" (*of external manipulation, interference or coercion, and intimidation*), "prior" (*timely disclosure of information*) and "informed" (*relevant, understandable and accessible information*). • Adequately incorporate project affected communities' concerns.	• ER • Gazania Investment 242 (Pty) Ltd / ER	
3) All activities	• Grievance Mechanism	• Social and Environmental Performance	• Ensure a mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance during the construction phase. • Address concerns promptly and transparently and in a culturally appropriate manner.	• Gazania Investment 242 (Pty) Ltd / ER	
4) All activities	• Training including awareness and inductions	• Social and Environmental Performance	• Train employees and contractors in matters related to the project's social and environmental performance, Namibia's regulatory requirements. • Ensure adequate environmental awareness training for all senior site personnel. • Give environmental induction presentations to all site personnel prior to work commencement.	• Gazania Investment 242 (Pty) Ltd • Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
5) All activities	• Labour and Working Conditions	• Social and Environmental Performance	• Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed. • Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour. • Promote safe and healthy working conditions and the protection and promotion of worker health. • Prepare a Human Resources Policy and document and communicate the Working Conditions and Terms of Employment. • Respect Collective Agreements and the right of workers to organize and bargain collectively. • Prepare a Retrenchment Plan. • Implement a Grievance Mechanism.	• Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Construction Phase
6) All activities	• Employment and procurement opportunities	• Socio-economic	• Ensure local recruitment (of registered contractors or qualified and certified personnel, registered and certified with the appropriate statutory authority) and procurement to maximize benefit to region.	• Gazania Investment 242 (Pty) Ltd	
7) All activities	• Occupational Health and Safety	• Social and Environmental Performance	• Prepare and submit an Emergency Preparedness and Response Plan. • Adhere to all Namibian Health and Safety Regulations. • Occupational Health and Safety Training to be provided to all employees. • Ensure that qualified first aid can be provided at all times. • Provide and ensure the active use of Personal Protective Equipment (PPE).	• Contractor	
8) All activities	• Community Health and Safety	• Social and Environmental Performance	• Prevent communicable disease (e.g sexually transmitted diseases (STDs) such as HIV/AIDS transmission): provide surveillance and active screening and treatment of employees; prevent illness among employees in local communities (through health awareness and education initiatives); ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers; and promote immunization.	• Gazania Investment 242 (Pty) Ltd / Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
9) All activities	• Unauthorized public access	• Community Safety	• Use gates on the access road(s) and the entire mine site must be fenced off. • Mine site should not be accessible to anyone from the public. • Notice or information boards relating public safety hazards and emergency contact details should be put up at the gate(s) and at the mine site. • Create a viewpoint area, possibly including an information centre, for the public/tourists as part of the early stages of the Closure Plan provisions.	• Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Construction Phase
10) All activities	• Construction	• Change in land.	• Restrict construction activities to demarcated / disturbed areas; all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land; • Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Contractor	
11) Mine Infrastructures and Mine Workings layout planning	• Mine Infrastructures and Mine Workings Layout	• Visual	• Minimize the presence of secondary structures: minimize number of access roads, and bury intra-project power lines. • Adhere to the regulations, rules, procedures, current and future regional and local land use plans for the area.	• Gazania Investment 242 (Pty) Ltd / Engineer	
12) Mine Infrastructures and Mine Workings design specifications	• Mine Infrastructures and Mine Workings appearance	• Visual	• Structural height and colour must be kept uniform; • Mine infrastructures and mine workings installation must be painted with a non-reflective coating to avoid high reflections; • Avoid using graphics or lettering on the mine infrastructures and mine workings	• Gazania Investment 242 (Pty) Ltd / Engineer	
13) All activities	• Construction Activities	• Disturbance of fauna and flora and habitat alteration	• The planning and design to ensure minimum impact to the environment. • No trees or natural vegetation may be removed from the ML area for the making of fires or sale. • No animal may be injured, fed, trapped, hunted or harmed in any way. • No off-road driving will be allowed. • No trespassing on adjoining properties is allowed and no livestock, game or vegetation are to be interfered with.	• Gazania Investment 242 (Pty) Ltd / ER • Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
All activities (13) *Cont*.		• Pollution of biophysical environment (air, soil and water)	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Vehicle maintenance/servicing/washing not to be allowed anywhere on site/at the camp. • Portable toilets to be provided and used at the camp. • Sanitary wastewater to be released into a French drain System. • Use bio-degradable detergents on site. • Enforce proper waste (hazardous and non-hazardous) management practices (as per Waste Management Plan) – waste and litter to be disposed of in scavenger and weatherproof bins and the refuse to be collected by the contractor and disposed of at least once a week.	• Contractor	Ongoing throughout the Construction Phase
		• Occupational Health and Safety	• No fires will be allowed, unless a specific area has been identified and set aside by the ER for the cooking of food. • Ensure that employees are trained in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times. • Comply with all safety regulations regarding electricity supply. • Supply potable water for human consumption and other domestic uses; conduct chemical testing of water samples on a monthly basis (if applicable). • Make suitable arrangements, as far as practicable, for the maintenance of health, the prevention and overcoming of outbreaks of disease and of adequate first aid services. • Ensure that security arrangements are in place.	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
14) Site preparation (Continue from Preconstruction)	• Clearing of areas for construction	• Disturbance of fauna and flora and habitat alteration	• Restrict construction activities to previously demarcated areas; all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land. • Minimize the removal of native plant species; no vegetation may be removed/damaged without direct instruction. • No off-road driving will be allowed. • No animal may be injured, fed, trapped, hunted or harmed in any way.	• Contractor	Ongoing throughout the Construction Phase
		• Soil erosion	• Sediment mobilization and transport: reduce or prevent soil erosion (schedule activities to avoid heavy rainfall periods; contour and minimize length and steepness of slopes; mulching to stabilize exposed areas; re-vegetate areas promptly; and design channels and ditches for post-construction flow). • Structural (slope) stability: provide effective short-term measures for slope stabilization, sediment and subsidence control until long-term measures (during operations) can be implemented; provide adequate drainage systems to minimize and control infiltration.	• Engineer / Contractor • Engineer / Contractor	
		• Possible loss of the seed bank in the topsoil	• The upper layer of soil (10-20 cm), where alluvial, to be stripped and stockpiled separately (1-2 m high piles to allow for proper aeration). Install drainage to protect the topsoil pile from (water) erosion and cover it to protect it from (wind) erosion.	• Contractor	
15) Infrastructure construction	• Increased traffic, presence and movement of machinery, and the establishment of soil stockpiles	• Air quality (dust or Particulate Matter (PM) pollution)	• Minimize the area in which the movement of construction machines will take place to reduce the effects of dust pollution. • Minimize dust from material handling sources (e.g. conveyors and bins) by using covers and/or control equipment (e.g. water suppression). • Minimize dust from open area sources, including storage piles, by using control measures (install enclosures and covers, and increase the moisture content). • Avoid the excavation, handling and transport of erodible materials under high wind conditions or when a visible dust plume is present.	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
Infrastructure construction (15) *cont.*	• Increased traffic/vehicle movement	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).	• Contractor	Ongoing throughout the construction Phase
	• Increased traffic, presence and movement of machinery (exhaust from diesel engines)	• Air quality & Occupational and Community Health and Safety	• Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).	• Contractor	
	• Presence of machinery, construction workers, infrastructure and associated equipment	• Visual and noise	• Avoid critical habitats (for site transmission and distribution rights of way, lines, towers and substations) through using existing utility and transport corridors (transmission and distribution) where possible.	• Engineer / • Contractor	
	• Increased traffic, movement of machinery	• Occupational and Community Safety	• Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers; improve driving skills and require licensing of drivers; adopt limits for trip duration; avoid dangerous routes and times of day; and use speed control devices. • Regularly maintain vehicles and use manufacturer approved parts. • Use locally sourced materials (where possible) to minimize transport distances. • Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.	• Contractor	
	• Mine Infrastructures and Mine Workings foundations	• Occupational Safety	• Ensure that all excavations are properly performed and in accordance with Occupational, Health and Safety (OH&S) regulations. • Ensure that the handling of concrete follow health and safety precautions (as per Material Safety Data Sheets (MSDS)).	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
16) Mine Infrastructures and Mine Workings Components Height installations	• Working at heights	• Occupational Safety	• Test integrity of structure(s) before work commences. • Implement a fall protection program (including training in climbing techniques and the use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers). • Establish criteria for use of 100% fall protection (the system should be fitting for the mine infrastructures and mine workings structure and movements (ascent, descent, and moving from point to point)). • Install fixtures on high components to facilitate the use of fall protection systems. • Provide an adequate work-positioning device system to workers (with connectors on positioning systems compatible with the mine infrastructures and mine workings components to which they are attached). • Ensure proper rating and maintenance of hoisting equipment and training of hoist operators. • Use safety belts of not less than 15.8 mm two in one nylon or material of equivalent strength; replace rope safety belts before signs of aging or fraying of fibres become evident. • Workers to use a second (backup) safety strap when operating power tools at height. • Remove signs/other obstructions from poles/structures before work commences. • Use approved tool bags for lowering/raising tools/materials to workers on elevated mine infrastructures and mine workings structures. • Avoid conducting mine infrastructures and mine workings installation during poor weather conditions (especially where there is a risk lightning strikes or strong winds).	• Contractor	Ongoing throughout the construction Phase

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
17) Power transmission and distribution	• Above Ground and Underground cables to transformer station; transmission lines)	• Habitat alteration & Occupational and Community Health	• Restrict excavation activities to previously demarcated areas; all other areas will be regarded as "no go" zones in order to minimize the impact on the surrounding land. • Ensure that all excavations are properly performed and in accordance with Occupational, Health and Safety (OH&S) regulations. • Restrict trench excavation to a pace that matches cable installation and backfill. No more than 300 m of open trench to exist at any time.	• Gazania Investment 242 (Pty) Ltd / Engineer	Ongoing throughout the construction Phase
18) Power transmission and distribution	• Habitat alteration	• Bird and bat collisions and electrocutions	• Align transmission corridors to avoid critical habitats. • Maintain 1.5 m spacing between, or cover energized components and grounded hardware. • Consider the installation of underground transmission and distribution lines (sensitive areas). • Install visibility enhancement object (marker balls, bird deterrents, or diverters).	• Gazania Investment 242 (Pty) Ltd / Engineer	
19) Power transmission and distribution	• Electric and Magnetic Fields (EMF)	• Occupational and Community Health	• Ensure that average and peak exposure levels remain below the reference levels developed by the Commission of Non-Ionizing Radiation Protection (ICNIRP). • Reduce the EMF (from power lines, substations, or transformers) by applying engineering techniques (if levels are expected or confirmed above the recommended levels): shielding with specific metal alloys; burying transmission lines; increasing the height of the transmission towers; or modifications to size, spacing and configuration of conductors.	• Gazania Investment 242 (Pty) Ltd / Engineer	
20) Power transmission and distribution	• Hazardous materials management	• Pollution of biophysical environment (soil and water)	• Minimize the use of SF6 (greenhouse gas). • The use of PCBs has largely been discontinued (see *IFC EHS Guidelines for Electric Power Transmission and Distribution* for the management of PCBs should it be used). • All activities, Hazardous materials management. • Wood preservatives? Needed?	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
21) Power transmission and distribution	• Live power lines	• Occupational Health and Safety	• Allow only trained/certified employees to install, maintain, and repair electrical equipment. • Deactivate and properly ground live power distribution lines before work is conducted on, or close to, distribution lines. • Ensure that live-wire work is conducted by qualified workers and in accordance to the specific safety and insulation standards. • Do not approach an exposed energized or conductive part (even if the worker is trained) unless: the person is properly insulated from the energized part (e.g. gloves) and *vice versa*; the worker is properly isolated and insulated from any other conductive part (live-line work). • Implement a Health and Safety Plan, detailing specific training, safety measures, personal safety devices and other precautions, where maintenance and operation is required within minimum setback distances.	• Gazania Investment 242 (Pty) Ltd / Contractor	Ongoing throughout the construction Phase
22) Power transmission and distribution	• Working at heights on poles/structures	• Occupational Health and Safety	• See mine infrastructures and mine workings components, working at heights.	• Contractor	
23) Power transmission and distribution	• EMF	• Occupational Health and Safety	• Prepare and implement an EMF Safety Program containing information on: potential exposure levels in the workplace and the use of personal monitors; training of workers to identify EMF levels and hazards; the identification and establishment of safety zones (areas acceptable for public exposure vs. those with expected elevated EMF levels and that only properly trained workers may access); action plans dealing with potential or confirmed exposure of levels that exceed those developed by the ICNIRP and Institute of Electrical and Electronics Engineers (IEEE).	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
24) Power transmission and distribution	• Electrocution	• Community Health and Safety	• Use signs, barriers, and education to prevent public contact with potentially dangerous equipment. • Ground conducting objects installed near power lines.	• Gazania Investment 242 (Pty) Ltd	Ongoing throughout the construction Phase
25) All activities	• Water Management	• Resource use / depletion of natural resources	• Implement a water conservation program, promoting the continuous reduction in water consumption and achieving savings in water pumping, treatment and disposal costs, commensurate with the magnitude and cost of water use.	• ER / Contractor	
26) All activities	• Hazardous materials management • Maybe this can come out; important, but more to do with overall hazardous materials management	• Social and Environmental Performance	• Establish hazardous materials management priorities (based on hazard analysis of risky operations). • Avoid, or minimize the use of hazardous materials. • Prevent uncontrolled releases of hazardous materials to the environment or uncontrolled reactions that may result in fire or explosion. • Make us of engineering controls (containment, automatic alarms and shut-off systems); implement management controls (procedures, inspections and training, communication and drills) to address residual risks not prevented or controlled through engineering controls.	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
27) All activities	• Hazardous materials management (of mainly fuels and lubricating and hydraulic oils for construction and operating vehicles and equipment; substation transformer insulating oil; other chemicals used during mine construction, including concrete admixture chemicals such as surface active agents, plasticizers and form release oil (mineral); equipment coolants and maintenance chemicals such as solvent cleaners and paints)	• Pollution of biophysical environment (soil and water)	• Implement prevention and control measures for the use, handling and storage of hazardous materials: o Materials transfer: regularly inspect, maintain and repair fittings/pipes/hoses; make use of drip trays/other drip containment measures at connection/possible overflow points; o Overfill protection: use trained filling operators; install gauges on tanks to measure the volume inside; make use of dripless hose connections (vehicle tanks) and fixed connections (storage tanks); use a catch basin/drip tray around the fill pipe to collect spills; o Reaction, fire, and explosion prevention: hazardous materials to be stored in marked containers and separate (from non-hazardous materials); incompatible hazardous materials (acids, bases, flammables, oxidizers, reactive chemicals) to be stored in separate areas and with containment facilities separating material storage; smoking or working with open flames not to be permitted in the presence of these substances; limit access to hazardous waste storage areas and clearly label and demarcate the area; conduct regular inspections of the areas and document the findings; prepare and implement spill response and emergency plans; train employees in the use of appropriate firefighting equipment and ensure that such equipment is on hand at all times. • Train workers on the correct transfer and handling of fuels and chemicals and the response to spills. • Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills; in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.	• Contractor	Ongoing throughout the construction Phase

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
28) All activities	• Hazardous materials management	• Occupational Health and Safety	• Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these. • Provide and ensure the active use of Personal Protective Equipment (PPE).	• Contractor	Ongoing throughout the construction Phase
29) All activities	• Waste management: solid	• Air quality	• Avoid the open burning of waste (whether hazardous, or non-hazardous).	• Contractor	
30) All activities	• Waste management: non-hazardous and hazardous	• Pollution of biophysical environment	• Prepare and submit a Waste Management Plan before construction commences. The generation of waste should be avoided or minimized as far as practicable; where it cannot be avoided, but has been minimized, waste should be recovered and reused; where waste cannot be recovered/reused, it should be treated, destroyed and disposed of in an environmentally sound manner. • Institute and maintain good housekeeping and operating practices; littering is not allowed. • Non-hazardous and hazardous waste to be collected and stored separately: • Non-hazardous waste to be transported to and disposed at an approved waste disposal site. • Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect and recycle batteries and print cartridges. The remainder to be transported to a recognized hazardous waste disposal site.	• Contractor	
31) All activities	• Waste management: sanitary	• Pollution of biophysical environment	• Portable toilets (1 toilet per 30 employees; preferred 1:15) to be provided on the site; contents to be collected by an approved contractor and disposed of at an approved sewage site.	• Contractor	

Table 4.2: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
32) All activities	• Waste water management - waste water treatment	• Pollution of biophysical environment	• Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or storm water to land conform to the regulatory requirements. • No discharge to Public Streams.	• Contractor / ER	Ongoing throughout the construction Phase
33) All activities	• Waste water management - storm water management	• Soil erosion	• Regular inspection and maintenance of permanent erosion and runoff control features.	• Contractor / ER / ECO	
34) Rehabilitation	• Rehabilitation	• Social and Environmental Performance	• Remove all equipment, waste, temporary structures, etc. from the camp and work sites. • Reshape all disturbed areas to their original contours. • Cover disturbed areas with previously collected topsoil and spread evenly. • Manually rip disturbed areas, where compaction has taken place, and cover the areas with previously collected topsoil. • Replant any previously removed native plant species in disturbed areas; • Adhere to the regulations, rules, procedures, current and future regional and local land use plans.	• Gazania Investment 242 (Pty) Ltd	Ongoing Rehabilitation throughout the Construction Phase

5. OPERATIONAL STAGE

5.1 Introduction

Once the construction of the mine infrastructures and mine workings and mine testing has been completed, the proposed mine development will move into the operational phase in order to produce the copper concentrate. Gazania Investment 242 (Pty) Ltd will be responsible for fulfilling the requirements in the Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the operational stage of the proposed mine. A Project / Site / Health Safety and Environmental (HSE) Manager / Engineer shall be appointed by Gazania Investment 242 (Pty) Ltd to oversee all the site operation as well as management of all the mine operational activities summarised as follows:

(i) Mining operations (actual mining operations including excavation, drilling, blasting as maybe required);

(ii) Transportation of the mined materials from pit to the processing plant for sorting, two (2) stage crushing, screening and stockpile of concentrate;

(iii) Storage and transportation of recovered minerals for export through the Port of Lüderitz;

(iv) Old and new tailings and waste rock (Phases 1 and 2);

(v) Ongoing exploration support;

(vi) Ongoing rehabilitation and maintenance;

(vii) Waste water and sludge disposal;

(viii) Mining, processing and minerals recovery impacts on water, and;

(ix) Mining, processing and minerals recovery impacts on the overall receiving environment (water, air, quality, flora, fauna and archaeology).

Table 5.1 outlines the Environmental Management Plan for the operational stage of the proposed mine. Adherence to the regulations, rules, procedures, current and future regional and local land use plans must be observed at all time by the operational staff.

5.2 Roles and Responsibilities

The following is the summary of the role and responsibilities of Project / Site / Health Safety and Environmental (HSE) Manager / Engineer during the operational stage of the proposed project:

- Act as the Employer's (Gazania Investment 242 (Pty) Ltd) on-site project and HSE manager;

- Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation (current and future Namibian legislation that may come into force, as well as International Standards) and the EMP for the Operations Stage of the proposed mine;

- ❖ Training of operations and maintenance staff to raise environmental awareness so that the day-to-day operations are carried out in an environmentally responsible manner, thereby preventing or minimizing the negative effects and maximizing the positive effects of the proposed operational project-related activities;

- ❖ Conduct regular (monthly) internal compliance audits; independent audits to be conducted bi-annually, and;

- ❖ Report to the Employer on the implementation of the EMP on site.

5.3 Other Supporting Teams

Project / Site / Health Safety and Environmental (HSE) Manager / Engineer will require a supporting team responsible for running various mine operational activities on the ground. The following is summary of the supporting teams that may be recruited during the operational stage of the proposed mine:

- ❖ Mining and ongoing exploration;

- ❖ Engineering;

- ❖ Maintenance;

- ❖ Electrical and electronic;

- ❖ Health Safety and Environmental (HSE), and;

- ❖ Others such as external consultants as may be required.

Table 5.1: Environmental Management Plan for the Operations Stage.

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
1) All activities	• Management and Monitoring	• Social and Environmental Performance	• Ensure that all aspects related to the EMP are implemented during the operations phase. • Adhere to the regulations, rules, and procedures as well as current and future regional and local and use plans.	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
2) All activities	• Consultation and Disclosure	• Social and Environmental Performance	• Consult with project affected communities in a structured and culturally appropriate manner throughout the operations phase. Consultation should be "free" (*of external manipulation, interference or coercion, and intimidation*), "prior" (*timely disclosure of information*) and "informed" (*relevant, understandable and accessible information*). • Adequately incorporate project affected communities' concerns.		
3) All activities	• Grievance Mechanism (EP 6)	• Social and Environmental Performance	• Ensure a mechanism for receiving and resolving any concerns and grievances related to the project's social and environmental performance during the operations phase. • Address concerns promptly and transparently and in a culturally appropriate manner.		
4) All activities	• Training including awareness and inductions	• Social and Environmental Performance	• Train employees and contractors in matters related to the project's social and environmental performance, Namibia's regulatory requirements, and the requirements of the EMP Performance Standards. • Ensure adequate environmental awareness training for all personnel. • Give environmental induction presentations to all new personnel prior to work commencement.		
5) All activities	• Labour and Working Conditions	• Social and Environmental Performance	• Establish, maintain and improve the worker-management relationship. Base the employment relationship on equal opportunity and fair treatment and no discrimination to be allowed. • Comply with Namibia's labour and employment laws and prevent unacceptable forms of labour, i.e. harmful child and forced labour. • Promote safe and healthy working conditions and the protection and promotion of worker health. • Document and communicate the Working Conditions and Terms of Employment. • Respect Collective Agreements and the right of workers to organize and bargain collectively.		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
6) All activities	• Employment and procurement opportunities	• Socio-economic	• Ensure local recruitment (of registered contractors or qualified and certified personnel, registered and certified with the appropriate statutory authorities and procurement to maximize benefit to region.	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
7) All activities	• Occupational Health and Safety	• Social and Environmental Performance	• Adhere to all Namibian Health and Safety Regulations as prescribed in the Labour Act and Mines Safety Policy / Regulations. • Occupational Health and Safety Training to be provided to all employees. • Ensure that qualified first aid can be provided at all times. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
8) All activities	• Community Health and Safety	• Social and Environmental Performance	• Prevent communicable disease (e.g sexually transmitted diseases (STDs) such as HIV/AIDS transmission): provide surveillance and active screening and treatment of employees; prevent illness among employees in local communities (through health awareness and education initiatives); ensure ready access to medical treatment, confidentiality and appropriate care, particularly with respect to migrant workers; and promote immunization.		
9) All activities	• Unauthorized public access	• Community Safety	• Use gates on the access road(s) and the entire site must be fenced off. • Mine site should not be accessible to anyone from the public. • Notice or information boards relating public safety hazards and emergency contact details should be put up at the gate(s) and at the mine site. • Create a viewpoint area, possibly including an information centre, for the public/tourists as part of the ongoing rehabilitation for mine closure and aftercare land use options as possible tourism product in the general area.		
10) All activities	• Increased traffic/vehicle movement	• Air quality (dust or Particulate Matter (PM) pollution)	• Maintain the road surface to preserve surface characteristics (e.g. texture and roughness). • Use dust control/suppression methods, such as applying water or non-toxic chemicals to minimize dust (oil and oil by-products is not a recommended measure to control road dust).		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
11) All activities	• Increased traffic/vehicle movement (exhaust from diesel engines)	• Air quality & Occupational and Community Health and Safety	• Fleet owners/operators to implement manufacturer recommended engine maintenance programs (to control vehicle emissions: Carbon Monoxide (CO), Nitrogen Oxide (NO_x), Sulphur Dioxide (SO_2), Particulate Matter (PM) and Volatile Organic Compounds (VOCs)).	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
12) All activities	• Increased traffic/vehicle movement	• Occupational and Community Safety	• Adopt best transport safety practices by implementing the following measures: emphasize safety aspects among drivers; improve driving skills and require licensing of drivers; adopt limits for trip duration; avoid dangerous routes and times of day; and use speed control devices. • Regularly maintain vehicles and use manufacturer approved parts. • Use locally sourced materials (where possible) to minimize transport distances. • Employ safe traffic control measures, including the use of traffic and safety warning signs and flag persons to warn of dangerous conditions.		
13) All activities	• Storm water management	• Attraction of species (birds and bats) to the area due to open water and subsequent injury, disturbance, or mortality of species	• Implement appropriate storm water management measures so as to avoid the presence of open water in the area. • Storm water around the mine site shall not be discharged into the Ephemeral Rivers / any public stream		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
14) Mine Operations	• Mine Operations components	• Species injury, disturbance (and potential alteration of behaviour), or mortality	• Implement monitoring programmes to study the potential impact(s) of the mine site operations on birds and bats.	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
	• Hazardous waste management	• Pollution of biophysical environment (soil and water)	• Mine site to be equipped with oil absorption and collection systems.		
15) General mine operational maintenance	• Cleaning and maintenance of mine site	• Resource use / depletion of natural resources	• Ensure all wash water is recycled. Ensure there are no leaks from all taps, pipes and fittings.		
	• Periodic painting of mine structures	• Pollution of biophysical environment (soil and water)	• Conform to ISO 12944:1998 Paints and varnishes - Corrosion protection of steel structures by protective paint systems- Part 4: Types of surface and surface preparation.		
	• Working at heights	• Occupational Safety	• Test integrity of structure(s) before work commences. • Implement a fall protection program (including training in climbing techniques and the use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers). • Establish criteria for use of 100% fall protection (the system should be fitting for the tower structure and movements (ascent, descent, and moving from point to point)). • Install fixtures on tower components to facilitate the use of fall protection systems. • Provide an adequate work-positioning device system to workers (with connectors on positioning systems compatible with the tower components to which they are attached). • Ensure proper rating and maintenance of hoisting equipment and training of hoist operators. • Use safety belts of not less than 15.8 mm two in one nylon or		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
General mine operational maintenance (15) *Cont.*			• Material of equivalent strength; replace rope safety belts before signs of aging or fraying of fibres become evident. • Workers to use a second (backup) safety strap when operating power tools at height. • Remove signs/other obstructions from poles/structures before work commences. • Use approved tool bags for lowering/ raising tools/materials to workers on elevated structures. • Avoid conducting maintenance during poor weather conditions (especially where there is a risk lightning strikes or strong winds).	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
16) Power transmission and distribution	• Electric and Magnetic Fields (EMF)	• Occupational and Community Health	• Ensure that average and peak exposure levels remain below the reference levels developed by the Commission of Non-Ionizing Radiation Protection (ICNIRP). • Reduce the EMF (from power lines, substations, or transformers) by applying engineering techniques (if levels are expected or confirmed above the recommended levels): shielding with specific metal alloys; burying transmission lines; increasing the height of the transmission towers; or modifications to size, spacing and configuration of conductors.		
17) Power transmission and distribution	• Hazardous materials management (insulating oils / gases (Polychlorinated Biphenyls (PCB) and sulphur hexafluoride (SF6)) and fuels)	• Pollution of biophysical environment (soil and water)	• Minimize the use of Greenhouse gas. • The use of Polychlorinated Biphenyls (PCBs) has largely been discontinued (see International Finance Corporation (*IFC) Environment, Health and Safety (EHS) Guidelines for Electric Power Transmission and Distribution* for the management of PCBs should it be used). • All activities, Hazardous materials management. • Wood preservatives? Needed?		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
18) Power transmission and distribution	• Live power lines	• Occupational Health and Safety	• Allow only trained/certified employees to install, maintain, and repair electrical equipment. • Deactivate and properly ground live power distribution lines before work is conducted on, or close to, distribution lines. • Ensure that live-wire work is conducted by qualified workers and in accordance to the specific safety and insulation standards. • Do not approach an exposed energized or conductive part (even if the worker is trained) unless: the person is properly insulated from the energized part (e.g. gloves) and *vice versa*; the worker is properly isolated and insulated from any other conductive part (live-line work). • Implement a Health and Safety Plan, detailing specific training, safety measures , personal safety devices and other precautions, where maintenance and operation is required within minimum setback distances	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
19) Power transmission and distribution	• Working at heights on poles/structures	• Occupational Health and Safety	• See General mine infrastructures and mine workings maintenance, working at heights.		
20) Power transmission and distribution	• EMF	• Occupational Health and Safety	• Prepare and implement an EMF Safety Program containing information on: potential exposure levels in the workplace and the use of personal monitors; training of workers to identify EMF levels and hazards; the identification and establishment of safety zones (areas acceptable for public exposure vs. those with expected elevated EMF levels and that only properly trained workers may access); action plans dealing with potential or confirmed exposure of levels that exceed those developed by the ICNIRP and Institute of Electrical and Electronics Engineers (IEEE).		
21) Power transmission and distribution	• Electrocution	• Community Health and Safety	• Use signs, barriers, and education to prevent public contact with potentially dangerous equipment. • Ground conducting objects installed near power lines.		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
22) All activities	• Water Management	• Resource use / depletion of natural resources	• Implement a water conservation program, promoting the continuous reduction in water consumption and achieving savings in water pumping, treatment and disposal costs, commensurate with the magnitude and cost of water use.	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
23) All activities	• Hazardous materials management	• Pollution of biophysical environment (soil and water)	• Implement prevention and control measures for the use, handling and storage of hazardous materials. • Train workers on the correct transfer and handling of fuels and chemicals and the response to spills. • Immediately report and clean up any accidental hydrocarbon spill: Spill-Sorb, Drizzat Pads, Enretech Powder or Peat Moss can be used to clean up small spills; in case of larger spills, the spill together with the polluted soil should be removed and disposed of at e.g. a biological remediation site.		
		• Occupational Health and Safety	• Implement hazard communication and training programs (including information on Material Safety Data Sheets (MSDS)) to make employees aware of workplace chemical hazards and how to respond to these. • Provide and ensure the active use of Personal Protective Equipment (PPE).		
24) All activities	• Waste management: solid	• Air quality	• Avoid the open burning of waste (whether hazardous, or non-hazardous).		

Table 5.1: *Cont.*

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
25) All activities	• Waste management: non-hazardous and hazardous	• Pollution of biophysical environment	• As per Waste Management Plan. • Institute and maintain good housekeeping and operating practices; littering is not allowed. • Non-hazardous and hazardous waste to be collected and stored separately: • Non-hazardous waste to be transported to and disposed off at an approved waste disposal site. • Hazardous waste: recycle petroleum (fuels and lubricants) waste products and collect and recycle batteries and print cartridges. The remainder to be transported to a recognized hazardous waste disposal site, with prior permission from the site operator / owner.	Gazania Investment 242 (Pty) Ltd	Ongoing throughout the Operational Phase
26) All activities	• Waste management: sanitary	• Pollution of biophysical environment	• Toilets and Shower Blocks to be provided on the site as prat of the administration and supporting infrastructure; contents to be collected by an approved contractor and disposed of at an approved sewage site. Unless there will be a sewage plant?		
27) All activities	• Waste water management	• Pollution of biophysical environment	• Ensure that the discharge of process wastewater and/or sanitary wastewater and/or wastewater from utility operations and/or storm water to land conform to the regulatory requirements. • Discharge to any public stream is prohibited		

6. CLOSURE AND AFTERCARE STAGES

6.1 Introduction

The proposed mine closure and aftercare stages of the proposed mine will cover all the activities that are aim at restoring the proposed mine site to safe state. The closure and aftercare stages will be an ongoing process during the proposed mine operations stage with the final closure and aftercare stages implemented once the proposed mine has reached its useful lifespan. The closure stage will cover the restoration of the open pits, tailings, waste rock, removal of all structures such as the foundation, steel works and concrete casted to hold all structures that were constructed to support the proposed mine. The aftercare will cover the long-term stability and environmental sustainability maintenance of all the remaining supporting infrastructures such tailings dump, pits and waste rock. The following is summary of the activities that will be undertaken as part of the final closure and aftercare stages of the proposed mine:

(i) Implementation of sustainable socioeconomic plan;

(ii) Closure of open pits / shafts;

(iii) Closure of solid waste piles;

(iv) Backfill waste dump sites;

(v) Closure of storage sites;

(vi) Decommissioning of water and electricity infrastructure;

(vii) Overall land reclamation;

(viii) Restoration of internal roads, and;

(ix) Revegetation and aftercare as may be required.

This EMP Vol. 2 of 2 Report makes provisions for management of a wider array of activities that will be associated with the proposed mine closure and aftercare stages. Table 6.1 outlines the EMP framework for the closure and aftercare stages of the proposed mine. Table 6.2 summarise key mine components to be addressed in the ongoing and final mine Closure Plan.

6.2 Roles and Responsibilities

6.2.1 Employer's Representative (ER

As part of the mine closure and aftercare stages, Gazania Investment 242 (Pty) Ltd is to appoint an **Employer's Representative (ER)** with the following responsibilities:

- Act as the Employer's (Gazania Investment 242 (Pty) Ltd on-site project manager and implementing agent;
- Appoint the Environmental Control Officer (ECO);

- ❖ Ensure that the Employer's responsibilities are executed in compliance with the relevant legislation and the EMP for the closure and aftercare stages;
- ❖ Ensure that all the necessary environmental authorizations and permits have been obtained for the mine closure and aftercare stages;
- ❖ Assist the Contractor in finding environmentally responsible solutions to challenges that may arise (with input from the ECO);
- ❖ Should the ER be of the opinion that a serious threat to, or impact on the environment may be caused by the closure and aftercare stages, he/she may stop work; the Employer must be informed of the reasons for the stoppage as soon as possible;
- ❖ The ER has the authority to issue fines for transgressions of basic conduct rules and/or contravention of the EMP;
- ❖ Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the ER can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied;
- ❖ Report to the Employer on the implementation of this EMP on site (with input from the ECO and/or independent environmental auditor);
- ❖ Maintain open and direct lines of communication between the Employer, ECO, Contractor and I&APs with regards to environmental matters, and;
- ❖ Attend regular site meetings and inspections on the progress of the mine closure and aftercare stages process.

6.2.2 Environmental Control Officer (ECO)

The **Environmental Control Officer (ECO)** has the following responsibilities:

- ❖ Assist the ER in ensuring that the necessary environmental authorizations and permits have been obtained for the mine closure and aftercare stages;
- ❖ Assist the ER and Contractor in finding environmentally responsible solutions to challenges that may arise;
- ❖ Conduct environmental monitoring as per EMP requirements;
- ❖ Recommend on the issuing of fines for transgressions of basic conduct rules and/or contraventions of the EMP to the ER;
- ❖ Advise the ER on the removal of person(s) and/or equipment not complying with the specifications of the EMP;
- ❖ Carry out regular site inspections (on average once per week) of all construction areas with regards to compliance with the EMP; report any non-compliance(s) to the ER as soon as possible;

- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through the mine closure and aftercare stages; audit reports to be submitted to the ER;

- ❖ Organize for an independent post mine closure and aftercare stages environmental audit to be carried out before certificates are issued by the relevant authorities;

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document;

- ❖ Monitor the Contractor's environmental awareness training for all new personnel coming onto site;

- ❖ Keep records of all activities related to environmental control and monitoring; the latter to include a photographic record of the mine closure and aftercare stages as well as environmental control and rehabilitation process, and a register of all major incidents, and;

- ❖ Attend regular site meetings as part of the mine closure and aftercare stages.

6.2.3 Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** include:

- ❖ Comply with the relevant national legislation and the EMP for the mine closure and aftercare stages;

- ❖ Preparation and submission (to Gazania Investment 242 (Pty) Ltd) of the following Management Plans:

    - o Environmental Awareness Training and Inductions;

    - o Emergency Preparedness and Response;

    - o Waste Management;

    - o Health and Safety, and;

    - o Electric and Magnetic Fields (EMF) Safety.

- ❖ Ensure adequate environmental awareness training for senior site personnel;

- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to the mine closure and aftercare stages work commencement; the ECO is to provide the course content and the following topics, at least but not limited to, should be covered:

    - o The importance of complying with the relevant Namibian, International and Best Practice Legislation;

    - o Roles and Responsibilities, including emergency preparedness;

    - o Basic Rules of Conduct (Do's and Don'ts);

- EMP: aspects, impacts and mitigation;
- Fines for Failure to Adhere to the EMP, and;
- Health and Safety Requirements.

❖ Record keeping of all environmental awareness training and induction presentations, and;

❖ Attend regular site meetings and environmental inspections.

6.3 Closure and Aftercare Stages Supporting Teams

The closure and closure activities of the proposed mine will require an array of specialist teams working very closely with their suppliers and core Gazania Investment 242 (Pty) Ltd site operations team. The following is a summary of some of the specialists that will be required during the mine closure and aftercare stages as part of the team of contractors / subcontractor:

❖ Care taker, Mechanical and Crane Contractors, Electrical Contractors and Civil/Structural Contractors, each with their respective Sub-contractors and Suppliers, would report directly to the Employer's Representative (ER), acting as the onsite Project Manager.

Table 6.1: Environmental Management Plan for the mine ongoing and final closure and aftercare stages.

ACTIVITY/PROCESS	ASPECT	IMPACT	MANAGEMENT ACTIONS	RESPONSIBLE PERSON(S)	TARGET DATE
1) Mine closure and aftercare stages	• Ongoing and Final closure and aftercare stages	• Social and Environmental Performance & Visual	• Isolate (electrically) the mine site from the substation. • Disassemble the steel works and cut off at the top of the foundation concrete; rehabilitate the hardstand area. • Remove all above-ground substation infrastructure and re-use, recycle or dispose of it. • Conduct a site contamination assessment; remove any contaminated material and dispose of at an appropriate disposal facility. • Break up foundations all the mine site and remove for disposal. • Dig up below-ground substation infrastructure and remove. • Conduct a validation survey to ensure that all contaminated material at the substation has been removed; remove any contaminated material and dispose of at an appropriate disposal facility. • Rehabilitate access tracks not required for ongoing land use activities. • Remove all other equipment, waste, etc. from the area. • Reshape tailings, waste and all disturbed areas to the surrounding contours. • Secure pit and other area with previously collected topsoil and spread evenly. • Manually rip disturbed areas, where compaction has taken place, and cover the areas with previously collected topsoil. • Replant any previously removed native plant species in disturbed areas.	• Gazania Investment 242 (Pty) Ltd / Contractor	• During Closure and Aftercare Stages
2) Closure	• Loss of jobs and income	• Socio-economic	• Implement a skills training programme during the operations phase.	• Gazania Investment 242 (Pty) Ltd Energy (PTY) LTD	• Ongoing throughout the Operational Phase

Table 6.2: Mine components to be addressed in the ongoing and final mine Closure Plan.

Components	Aspects to be Addressed
Open Pit Mines	○ Slope and bench stability ○ Groundwater and rainwater management ○ Security and unauthorized access ○ Wildlife entrapment ○ Effects of drainage into and from the pit
Ore Processing Facilities	○ Removal of buildings and foundations ○ Clean-up of workshops, fuel and reagent ○ Disposal of scrap and waste materials ○ Re-profiling and revegetation of site
Waste Rock Piles	○ Slope stability ○ Effects of leaching and seepage on surface and groundwater ○ Dust generation ○ Visual impact ○ Special considerations for some types of mines such as uranium mines
Tailings Management Facilities	○ Dam stability ○ Changes in tailings geochemistry ○ Effects of seepage past the dam and from the base of the facility ○ Surface water management and discharge ○ Dust generation ○ Access and security ○ Wildlife entrapment ○ Special considerations for some types of mines such as uranium mines
Water Management Facilities	○ Restoration or removal of dams, reservoirs, settling ponds, culverts, pipelines, spillways or culverts which are no longer needed ○ Surface drainage of the site and discharge of drainage waters ○ Maintenance of water management facilities
Landfill / Waste Disposal Facilities	○ Disposal or removal from site of hazardous wastes ○ Disposal and stability of treatment sludge ○ Removal of sewage treatment plant ○ Prevention of groundwater contamination ○ Prevention of illegal dumping ○ Security and unauthorized access
Infrastructure	○ Removal of power and water supply ○ Removal of haul and access roads ○ Reuse of transportation and supply depots

7. ENVIRONMENTAL PERFORMANCE MONITORING

7.1 Overview

The environmental monitoring process of the EMP performances for the proposed remediation and processing of the historic waste dumps (Phase 1) and the development of the in-situ mining operations (Phase 2) as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215 is divided into two parts and these are:

(i) Monitoring activities and effects to be undertaken by the Environmental Control Officer (ECO);

(ii) Preparation of an Environmental Monitoring Report covering all activities related to the Environmental Management Plan throughout the life cycle of the proposed mine to be undertaken by the Environmental Control Officer (ECO).

As part of the provisions of this EMP and the conditions of the Environmental Clearance Certificate (ECC) that will be issued by the Office of the Environmental Commissioner (OEC) in the Ministry of Environment and Tourism, continuous environmental monitoring and reporting must be undertaken as required. The reporting process will form part of the ongoing environmental monitoring programme.

Environmental monitoring programme is part of this EMP performances assessments and will need to be compiled and submitted as determined by the regulator (OEC). The process of undertaking appropriate monitoring as per specific topic and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Environmental Control Officer (ECO) / External Consultant / Suitable qualified in-house resource person. Tables 7.1 – 7.9 outline the type of information that shall need to be recorded on a regular by the Environmental Control Officer (ECO) as part of the monitoring process of the activities and the effects.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to effectiveness of the EMP at the end of the proposed mine life to be undertaken by the Environmental Control Officer (ECO). The types of the data sets to be used in the preparation of such a report are outlined in Tables 7.1 - 7.9. The objective will be to ensure that corrective actions are reviewed and steps are taken to ensure compliance for future EIA and EMP implementation. The report shall outline the status of the environment and any likely environmental liability after completion of the proposed project. The report shall be submitted to the OEC in the Ministry of Environment and Tourism.

Table 7.1: Monitoring of environmental performance implementation / environmental awareness training.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there an Environmental awareness training programme?					
How many people have been given environmental awareness training?					
Is a copy of the EMP on site?					
How effective is the awareness training? Do people understand the contents of the EMP? Where are the weaknesses? Ask 3 people at random various questions about the EMP.					

Table 7.2: Monitoring of environmental performance for the temporal and permanent structures.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are the temporal and permanent structures positioned to avoid sensitive zones, ephemeral river channels and potential sensitive sites?					
Has new infrastructure been created? If so, what, and how well planned / built with respect to environment?					
Have toilets and showers been provided? Where are they situated?					
Do receptacles for waste have scavenging animal proof lids?					
What litter is there – who is littering?					
Are there facilities for the disposal of oils / etc and how often is it removed to an approved disposal site?					
Is there evidence of oil / diesel spills? Bunding or not?					
What fuel source is being provided for cooking?					
Housekeeping					

Table 7.3: Environmental data collection.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are records being kept?					
Birds' mortality records as result of collision with the mine associated infrastructure?					
Birds nesting activities around the mine site?					
Noise level?					
Air Quality?					
Have archaeological sites been found / disturbed / described?					
Other key environmental data sets?					

Table 7.4: Health, Safety and ENvionment (HSE).

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Is there First Aid Kit containing anti-histamines etc?					
Are dangerous areas clearly marked off?					
Do vehicles appear to maintain the recommended speed limits?					
Do vehicles drive with headlights on along the gravel roads at all times?					

Table 7.5: Recruitment of labour.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
What labour source is used?					
How has the recruitment practice been done?					

Table 7.6: Management of the natural habitat and surficial materials management.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Has there been any development done on or very close sensitive areas?					
Has anyone been caught with plants or animals in their possession?					
Has there been wilful or malicious damage to the environment?					
Has topsoil / seed bank layer been removed from demarcated development areas and appropriately stored?					

Table 7.7: Tracks and off-road driving.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Are existing tracks used and maintained?					
What new tracks have been developed and are they planned?					
What evidence is there of off-road driving? Who appears to be responsible?					
Are corners being cut, what type of turning circle are there? Three point turns vs. U turns?					
Have unnecessary tracks been rehabilitated and how well?					
Comments					

Table 7.8: Management of surface and groundwater.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
How is potable water supplied and how often? Position of tanks?					
Is water being wasted?					
Is there any leakage from pipes or taps?					
Were water samples taken regularly and measured?					

Table 7.9: Public relations.

Mitigation	Compliance	Follow-up Action Required	By Whom	By When	Completed
Have any complaints been made about the mine construction and or operational activities by the different I&APs? If so, what, and how was the issue resolved?					

8. ENVIRONMENTAL AWARENESS

8.1 Company / Proponent Environmental Policy

Table 8.2 summarises the environmental statement with respect to environmental commitment that the Proponent, Gazania Investment 242 (Pty) Ltd will implement as part of the company environmental policy.

Table 8.1: Environmental statement.

Gazania Investment 242 (Pty) Ltd Environmental Statement
Gazania Investment 242 (Pty) Ltd is Committed to: 1. Exercising appropriate environmental care in accordance with the provisions of the EMP as presented in Tables 3.1, 4.1, 5.1 and 6.1 from preconstruction to closure and aftercare stages. 2. Fully comply with all applicable environmental regulations in force in Namibia; 3. Delivery of significant socioeconomic benefits for through broad based equity participation in the Project Development and Operation. 4. The promotion the development of open and constructive partnerships with the all the relevant stakeholders to address environmental concerns and advance necessary protection measures. 5. The advancement of scientific knowledge to be applied to the identification and effective resolution of real environmental challenges associated with the proposed mine development. 6. Continuously encouraging Pollution Prevention (P2), Cleaner Production (CP), Waste Minimisation, Reuse and Recycling efforts. 7. Conducting regular internal and external audits of all our operations to ensure adherence to this policy and compliance to all relevant regulations throughout the life cycle of the proposed mine.

8.2 Environmental Awareness Guidance

(i) The Environmental Rules apply to EVERYBODY. This includes all permanent, contract, or temporary workers as well as any other person who visits the mine site. Any person who visits the mine site will be required to adhere to the company Environmental Code of Conduct;

(ii) The Site Manager will issue warnings and will discipline ANY PERSON who breaks anyone of the Environmental Rules and Procedures. Repeated and continued breaking of the Rules and Procedures will result in a disciplinary

hearing and which may result in that person being asked to leave the site permanently;

(iii) The ENVIRONMENT means the whole surroundings around us. The environment is made-up of the soil, water, air, plants and animals; and those characteristics of the soil, water, air, plant and animal life that influence human health and wellbeing;

(iv) If any member of the WORK FORCE does not understand, or does not know how to keep any of Environmental Rule or Procedure, that PERSON must seek advice from the ENVIRONMENTAL CONTROL OFFICER (ECO), SITE MANAGER or CONTRACTOR. The PERSON that does not understand must keep asking until she/he is able to keep to the all the Environmental Rules and Procedures.

8.3 Environmental Awareness Training Materials

8.3.1 Natural Environmental Management Guidance

- Never feed, tease or play with, hunt, kill, destroy or set devices to trap any wild animal (including birds, reptiles and mammals), livestock or pets. Do not bring any wild animal or pet to the mine site;
- Do not pick any plant or take any animal out of the mine site area EVER. You will be prosecuted and asked to leave the project area;
- Never leave rubbish and food scraps or bones where it will attract animals, birds or insects. Rubbish must be thrown into the correct rubbish bins or bags provided;
- Protect the surface material by not driving over it unnecessarily;
- Do not drive over, build upon, or camp on any sensitive habitats for plants and animals;
- Do not cut down any part of living trees / bushes for firewood;
- Do not destroy bird nest, dens, burrow pits, termite hills etc or any other natural objects in the area.

8.3.2 Vehicle Use and Access Guidance

- Never drive any vehicle without a valid licence for that particular vehicle and do not drive any vehicle that appears not to be road-worthy;
- Never drive any vehicle when under the influence of alcohol or drugs;
- DO NOT make any new roads without permission. Stay within demarcated areas;
- Avoid U-Turns and large turning circles. 3-point turns are encouraged. Do not ever drive on rocky slopes or vegetated dune areas;

- ❖ Stay on the road, do not make a second set of tracks and do not cut corners;
- ❖ DO NOT SPEED - keep to less than 60 km per hour on the tracks and site roads;
- ❖ No off-road driving is allowed;
- ❖ Vehicles may only drive on demarcated roads;
- ❖ Adhere to speed limits and drive with headlights switched on along any gravel road.

8.3.3 Air Emission and Dust Reduction

- ❖ Reduce speed for all trucks and vehicles on the mine and community roads to reduce dust emissions;
- ❖ Stock piles should be covered with dust biding chemical to reduce fugitive emissions;
- ❖ Chemical biding substance can be applied to road surfaces to supress dust particle and reduce emission within the mine which will reduce fugitive emissions in the community;
- ❖ Recycling water can be sprayed on roads, stockpiles and conveyors to suppress dust thus reducing dust emissions;
- ❖ Creating a buffer zone between the mine and the community – this can reduce noise and dust impact on the surrounding community by reducing the distance;
- ❖ Planting of trees in the buffer zones - this can further help to minimise the visual impact of mining operations on local communities. This also reduces the levels of noise and dust;
- ❖ Continuous weather monitoring on site and purchasing of quiet trucks and excavators and customised trucks with rubber matting to dampen sounds when they are being loaded.

8.3.4 Noise and Vibrations Emission Reduction

- ❖ Speed reduction can reduce noise associated with vehicles and trucks movements and ensure that vehicles are services regularly;
- ❖ Management to consider purchasing machineries that emit low levels of noise and ensure up-to-date maintenance of all equipment to reduce emission of noise from such machines;
- ❖ Careful selection of equipment and insulation and sound enclosures around machinery can control noise;
- ❖ Development of environmental noise management plan to keep any disturbance of the community to minimum levels – this can be done through: mine planning; plant and equipment design and selection; housing crushing and processing plant within buildings; enclosing conveyor systems; using terrain to acoustically shield the

operations and operational procedures like speed limits on roads around site which minimise dust emissions from trucks;

- ❖ Regular and extensive monitoring of noise impact associated with blasting as well as other mining operations;
- ❖ Restrictions of blasting time to midday can reduce the impact of noise and vibration;
- ❖ Designing detonation sequence with delays between holes so that blast waves from individual holes do not occur simultaneously at a neighbouring home or property.

8.3.5 Health and Safety Guidance

- ❖ Drink lots of water every day, but only from the fresh water supplies;
- ❖ Take the necessary precautions to avoid contracting the HIV/AIDS virus;
- ❖ Only enter or exit the mine at the demarcated gates / or road;
- ❖ Always keep the access area as you found them;
- ❖ Any damage to any existing infrastructure in the area must be report to the Environmental Control Officer / Project Manager who will then inform the owner of any damage with all the repairs done to the satisfaction of the owner or Environmental Control Officer;
- ❖ Never enter any area that is out of bounds, or demarcated as dangerous or wander off without informing or permission of team leader;
- ❖ Report to your Contractor or the Site Manager if you see a stranger or unauthorised person in the mine site;
- ❖ Do not remove any vehicle, machinery, equipment or any other object from the mine site without permission of your Contractor or the Site Manager;
- ❖ Wear protective clothing and equipment required and according to instructions from your Contractor or the Site Manager;
- ❖ Never enter or work in the mine when under the influence of alcohol or drugs.

8.3.6 Preventing Pollution and Dangerous Working Conditions Guidance

- ❖ Never throw any hazardous substance such as fuel, oil, solvents, etc. into streams or onto the ground;
- ❖ Never allow any hazardous substance to soak into the soil;
- ❖ Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled anywhere in the mine;
- ❖ Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip;

- ❖ Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities;

- ❖ Vehicles, equipment and machinery, containers and other surfaces shall be washed at areas designated by the Contractor or Environmental Control Officer/ Site Manager;

- ❖ If you are not sure how to transport, use, store or dispose any hazardous substance - ASK your Contractor or Environmental Control Officer / Site Manager for advice.

8.3.7 Saving Water Guidance

- ❖ Always use as little water as possible. Reduce, reuse and re-cycle water where possible;

- ❖ Report any dripping or leaking taps and pipes to your Contractor or Environmental Control Officer or Site Manager;

- ❖ Never leave taps running. Close taps after you have finished using them.

8.3.8 Disposal of Waste Guidance

- ❖ Learn to know the difference between the two main types of waste, namely:
    - o General Waste; and
    - o Hazardous Waste.

- ❖ Learn how to identify the containers, bins, drums or bags for the different types of wastes. Never dispose of hazardous waste in the bins or skips intended for general waste or construction rubble;

- ❖ Never burn or bury any waste within mining license area;

- ❖ Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full;

- ❖ Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping;

- ❖ Littering is prohibited.

8.3.9 Religious, Cultural, Historical and Archaeological Objects Guidance

- ❖ If you find any suspected religious, cultural, historical or archeologically object or site around the mine, you must immediately notify your Contractor or Environmental Control Officer **/** Site Manager;

- ❖ Never remove, destroy, interfere with or disturb any religious, cultural, historical or

archaeological object or site around the mine site.

8.3.10 Dealing with Environmental Complaints Guidance

- If you have any complaint about dangerous working conditions or potential pollution to the environment, immediately report this to your Contractor or the Environmental Control Officer ***/*** Site Manager;

- If any person complains to you about noise, lights, littering, pollution, or any other harmful or dangerous condition, immediately report this to your Contractor or the Environmental Control Officer / the Site Manager.

8.4 Environmental Personnel Register

Table 8.2 shows the Environmental Personnel Register to be signed by every person who receives or attends the Environmental Awareness Training or who has the training material explained to him or her or in possession of the training material.

Table 8.2: Environmental personnel register.

Date	Name	Company	Signature

9. CONCLUSION AND RECOMMENDATIONS

9.1 Summary of Conclusions

Mitigation measures for both positive and negative impacts have been proposed and management strategies are provided in this updated EMP for the following development stages:

(i) Preconstruction;

(ii) Construction;

(iii) Operation, ongoing exploration, monitoring and rehabilitation;

(iv) Decommissioning, closure and aftercare.

Based on the extent, duration, intensity and likely negative and positive impacts of the proposed development, this updated EMP incorporating all the relevant mitigation measures with respect to likely impacts and recommendations to be implemented by the developer / operator. This updated EMP implementation and monitoring activities covers all the stages of the proposed mine project life cycle and is inclusive of the preconstruction, construction, operation and ongoing rehabilitation and closure, final rehabilitation and aftercare stages.

9.2 Recommendations

It's hereby recommended that the Gazania Investment 242 (Pty) Ltd takes all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed mine project activities from construction to final closure and aftercare stages. The following are the recommended actions to be implemented by the proponent (Gazania Investment 242 (Pty) Ltd) as a part of the management of the impacts through implementations of this updated EMP Report:

(i) Contract an Environmental Control Officer / External Consultant / suitable in-house resources person to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project;

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned mine project life cycle;

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and subcontractors;

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identified and contract agreements need to be developed with costing provisions for environmental liabilities;

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer / External Consultant / suitable in-house resource person and to be submitted to the regulators and to end the proposed mine project;

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site.

All the responsibilities to ensure that the recommendations are executed accordingly, rest with the proponent (**Gazania Investment 242 (Pty) Ltd**). The proponent must provide all appropriate resource requirements for the implementation of this updated EMP as well as an independently managed (not directly controlled by the mining company) funding instrument for mine Closure and Aftercare environmental liabilities. It is the responsibility of the proponent to make sure that all members of the workforce including contractors and subcontractors are aware of this EMP provisions and its objectives.

It is hereby recommended that the proponent take all the necessary steps to implement all the recommendations of this updated EMP for the successful execution of the preconstruction, construction, operational, decommissioning, closure and aftercare activities of the proposed remediation and processing of the historic waste dumps (Phase 1) and the development of the in-situ mining operations (Phase 2) as well as all the supporting infrastructures such as roads, powerline and water supply within the ML 215.

END OF THE EMP