ENVIRONMENTAL MANAGEMENT & MONITORING PLAN (EMP)

PROPOSED EXPLORATION OF DIMENSION STONES, BASE AND RARE METALS, INDUSTRIAL AND PRECIOUS METALS ON EPL 8519 KARIBIB/OMARURU DISTRICT, ERONGO REGION

Prepared and Submitted By

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ABBREVIATIONS

BID	**Background Information Document**
CV	**Curriculum Vitae**
DEA	**Department of Environmental Affairs**
EA	**Environmental Assessment**
ECC	**Environmental Clearance Certificate**
EIA	**Environmental Impact Assessment**
EMP /S	**Environmental Management Plan / Statement**
GG	**Government Gazette**
GN	**Government Notice**
ha	**Hectare**
HIV	**Human Immunodeficiency Virus**
NMT	**non-motorised transport**
SMEs	**Small and Medium Scale Enterprises**

– **AM**	**Artisanal and mining**

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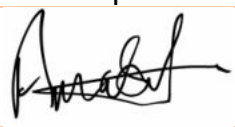
Signed	

1. EXECUTIVE SUMMARY

This document details the Environmental Management Plan (EMP) as informed by the Environmental & Social Impact Assessment (ESIA) conducted for the Proposed exploration of dimension stones, base and rare metals, industrial and precious metals on ELP 8519 Karibib/Omaruru district, Erongo region.

Namland Consultants will not be held responsible for any changes to the layout and any environmental impacts that may result as a consequence of such changes.

The EMP is intended to complement the project Environmental and Social Impact Assessment (ESIA) and is a companion document to the Environmental Management Act, 2007 (Act No.7 of 2007); Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878), and Minerals Policy, which was a milestone for the Ministry of Mines and Energy for the further development of the Namibian mining industry, as well as other legislations and policies as stipulated in the ESIA.

The presence of mining is quite often associated with major challenges, including safety and environmental management standards, spread of communicable diseases and challenging working conditions. The majority of the miners employ uncontrolled extraction techniques which damage crystals and mineral specimens, resulting in intermediate and high wastage at the extraction stage.

The Environmental Management Plan (EMP) involves multiple organizations and responsibilities shared between the Client and the Independent Environmental Monitoring Consultant. The community is also envisaged to play a pivotal role in the whole process as encompassed in the Human Rights Based Approach to Programming (HRBAP).

Environmental and social supervision shall be completed during project construction to ensure compliance of the construction contractor with EMP provisions and other Namibian regulatory requirements. Monitoring shall also be done during construction and operations to verify the success of mitigation measures and to conduct additional baseline sampling.

The EMP outlines reporting and communication procedures to ensure that EMP provisions are communicated and reported at all levels of the project, including local communities.

A key component of EMP success depends on effective capacity building and the training of staff and all others involved in the EMP. These efforts will also be assisted by the implementation of technical assistance by outside consultants.

The EMP shall be considered a controlled document and should be updated annually (or whenever possible), following a reportable incident or plan update. Considering the magnitude and nature of the project, there are no recommendations for additional studies, complementary to the EMP.

The information contained in this section is based to a large extent on the Minerals Policy guidelines.

An EMP is one of the most important products of an Environmental Assessment (EA) process. It synthesises all recommended mitigation and monitoring measures, laid out according to the various stages of a project life cycle, with clearly defined follow-up actions and responsibility assigned to specific actors. This EMP is a legally binding document and has been drafted in accordance with the Namibian Environmental Management Act (No. 7 of 2007) and it's Environmental Impact Assessment Regulations (2012) as well as the Minerals Policy. This plan describes the mitigation and monitoring measures to be implemented during the following phases of these developments:

- **Planning and Design** – the period, prior to the drafting of mining tender documents, during which preliminary legislative and administrative arrangements, necessary before any activity takes place and detailed designs/drawings are carried out;
- **Mining Tender Preparation** – the period during which the Client, having secured the necessary legislative and administrative arrangements, prepare mining tender documents for the development of services infrastructure to do the mining activities as well as any other mining process(s) within the development areas;
- **Mining** – the period during which the extraction activities will resume; and
- **Operation and Maintenance** – the period during which the infrastructure will be fully functional and maintained by the Client / Proponent.

Decommissioning and rehabilitation is envisaged for these developments. However, decommissioning and rehabilitation mitigation measures have been provided (see Table 6).

The commitments described here form part of the Environmental Clearance Certificate (ECC) between the Client and the state, as represented by the Ministry of Environment and Tourism (MET). Non-compliance is considered illegal and may have legal consequences. The amendment, transfer or renewal of the ECC should be communicated to the Environmental Commissioner as stipulated in the Environmental Management Act (EMA) of 2007 (S 39-42) and its EIA Regulations (S 19-20) and the Minerals Policy. Any changes to this EMP will require an amendment to the ECC for these developments.

2. INTRODUCTION

2.1. Background

This Environmental Management Plan (EMP) identifies the principles, approach, procedures and methods that will be used to control and minimize the environmental and social impacts of all mining and operational activities associated with project. It is intended to complement the project Environmental and Social Impact Assessment (ESIA) and ensure that commitments made by the project Proponent, and other sub-contractors to minimize project related environmental and social impacts are upheld throughout all project phases.

The EMP is also a companion document to the prevailing Namibian legal regulations which aims to mitigate environmental impacts and avoid or minimize social impacts arising from the project.

As part of their ongoing commitment to excellence in environmental and social performance for mining, the client will ensure the following:

- Fulfil all environmental and social conditions associated with project approvals;
- Develop, promote and foster a shared sense of responsibility for environmental and social performance of the project;
- Promote environmental awareness and understanding among employees and contractors through training, identification of roles and responsibilities towards environmental and social management and linking project performance to overall environmental performance;
- Encourage an understanding of social and cultural sensitivities in local communities and the importance of minimizing project impacts on local lifestyles and culture;
- Monitor environmental and social performance throughout the project and implement an adaptive management approach to continuous improvement;
- Work with local communities and project affected stakeholders to ensure that they benefit as a result of project development; and
- Maintain an ongoing commitment to informing, engaging and involving local stakeholders throughout all phases of the project.

2.2. EMP Structure and Organization

This EMP is designed as an overriding document in a hierarchy of control plans, and sets out the overarching framework of environmental management principles that will be applied to the project. It is directly related to the accompanying Environmental and Social Impact Assessment (ESIA) Report for the mining of dimension stones, base and rare metals, industrial and precious metals on ELP 8519 karibib/Omaruru district, Erongo region.

The EMP contains guiding environmental principles and procedures for communication, reporting, training, monitoring and plan review to which all construction staff, contractors and subcontractors are required to comply with throughout the preconstruction, construction and operation phases.
The EMP should be also be considered as an overall framework document that establishes the terms of reference for all project environmental and social sub-plans that will be completed.

3. RESPONSIBILITIES

The responsibility for the implementation of the EMP ultimately lies with the Miner / Proponent, who is also responsible for the eventual operation of these developments. The implementation of this EMP requires the involvement of several key individuals, each fulfilling a different but vital role to ensure sound environmental management during each phase of these developments.

The Miner should appoint an Employer's Representative (ER) to oversee all aspects of these developments for all development phases (including all contracts for work outsourced). The Developer may decide to assign this role to one person for the full duration of these developments, or may assign an ER to each of the development phases – i.e. one for the Planning and Design Phase, one for the Construction / Mining Phase and one for the Operational and Maintenance Phase.

The ER will in turn appoint an Environmental Control Officer (ECO) to oversee the implementation of the whole EMP during the Construction / Mining and Operation and Maintenance Phases. Again, the ER (and/or the Developer) may decide to assign this role to one person for both phases, or may assign a different ECO for each phase – i.e. one for the Construction Phase and another for the Operation and Maintenance Phase.

The following positions and their respective responsibilities are outlined below:
- Employer's Representative;
- Environmental Control Officer; and
- Contractor (Construction and Operations and Maintenance).

3.1 Employer's Representative

The ER is appointed by the Developer to manage all contracts for work/services that are outsourced during all development phases. Any official communication regarding work agreements is delivered through this person. The ER should with the commencement of the project, appoint a competent ECO who will represent the Miner / Proponent on-site.

During the Planning and Design and Construction/Mining Tender Preparation Phase, the ER will have the following responsibilities regarding the implementation of this EMP:

- Ensuring that the necessary legal authorisations have been obtained (see Table 1);
- Developing, managing implementation of and maintaining all Development Guidelines
- Ensure that the management requirements included in Table 3 inform the planning and design of the relevant infrastructure developments (i.e. that these requirements are considered during the Planning and Design Phase not as an afterthought); and
- Ensure that the management requirements included in Table 4 inform the preparation of tender documents for the construction of the relevant infrastructure developments.

During the Construction/Mining, Operation and Maintenance Phases the ER shall assist the ECO where necessary and will have the following responsibilities regarding the implementation of this EMP:

- Ensuring that the necessary legal authorisations and permits (see Table 1) have been obtained by the Contractor;
- Assisting the Contractor in finding environmentally responsible solutions to problems with input from the ECO where necessary;
- Ordering the removal of individuals and/or equipment not complying with the EMP;
- Issuing fines for transgression of site rules and penalties for contravention of the EMP; and
- Providing input into the ECO's ongoing internal review of the EMP. This review report should be submitted on a monthly basis to the Developer.

3.2 Environmental Control Officer (ECO)

The ECO should be a competent person appointed by the ER. The ECO is the Miner's on-site representative primarily responsible for the monitoring and review of on-site environmental management and implementation of the EMP by the Contractor. If no ECO is appointed the duties of the ECO fall upon the ER. During the Construction Phase and Operation and Maintenance Phase the ECO's duties include the following:

- Assisting the ER in ensuring that the necessary legal authorisations have been obtained;
- Maintaining open and direct lines of communication between the ER, Developer, the Construction and/or Operations and Maintenance Contractor, and Interested and Affected Parties (I&APs) with regard to this EMP and matters incidental thereto;
- Monthly site inspection of all construction and/or infrastructure maintenance areas with regard to compliance with this EMP;
- Monitor and verify adherence to the EMP (audit the implementation of the EMP) and verify that environmental impacts are kept to a minimum;
- Taking appropriate action if the specifications of the EMP are not adhered to;
- Assisting the Contractor in finding environmentally responsible solutions to problems;
- Advising on the removal of person(s) and/or equipment not complying with the specifications of the EMP in consultation with the ER;

- Recommending the issuing of fines for transgressions of site rules and penalties for contraventions of the EMP; and
- Undertaking an annual review of the EMP and recommending additions and/or changes to the document.

3.3 Contractor

The Contractor/Miner is responsible for the implementation of the EMP, on-site monitoring and evaluation of the EMP. It is envisaged that various contractors might be appointed at various periods for various tasks throughout the life cycle (construction through to decommissioning phase) of this project. These can be broadly grouped into Construction / Mine Contractors and Operations and Maintenance Contractors. In order to ensure sound environmental management, the relevant sections of this EMP should be included in all contracts of work outsourced thus legally binding all appointed contractors and sub-contractors. All contractors (miners) shall ensure that adequate environmental awareness training (see Section E) of senior site personnel takes place and that all construction workers and newcomers receive an induction presentation on the importance and implications of the EMP. The presentation shall be conducted, as far as is possible, in the employees' language of choice.

The Contractor / Miner should keep records of all environmental training sessions, including names, dates and the information presented.

4. MANAGEMENT REQUIREMENTS

This EMP has been structured so as to provide its various intended recipients (Developer, ER, consulting engineers and contractors) with mitigation measures immediately applicable to their respective scopes of work. The management requirements for the various recipients carrying out work for this project are divided according to the main project phases:

- Permit and relevant legal requirements (Table 1);
- Development Guidelines (Table 2);
- Planning and Design Phase requirements (Table 3);
- Construction/ Blasting / Mining Tender Preparation Phase requirements (Table 4);
- Construction / Blasting Phase mitigation requirements (Table 5); and
- Operation and Maintenance Phase mitigation requirements (Table 6).

Table 1: Relevant Namibian Guidelines and Legislated Permit Requirements

THEME	LEGISLATION INSTRUMENT	MANAGEMENT REQUIREMENTS	CONTACT PERSON
Environmental	– Environmental Management Act (EMA) 7 of 2007 – EIA Regulations (EIAR) (GN) No. 28/2007 (GG No. 4878)	The amendment, transfer or renewal of the Environmental Clearance Certificate (ECC) (EMA S39-42; EIAR S19 & 20). Amendments to this EMP will require an amendment of the ECC for these developments.	Ms Saima Angula Tel: 061 284 2751
	"List of activities that may not be undertaken without ECC" GG No. 4878 GN No. 29	Any activities listed in this listing notice require an ECC and hence an Environmental Assessment.	
Explosives and Blasting	Mine Health and Safety Regulations, Regulations made under the Section 138A of the Minerals (Prospecting & Mining) Act, 33 of 1992 as amended	Adhere to the Act requirements: – Accidents, dangerous occurrences and diseases – Mine workings – Outlets, travelling ways and ladder ways – Ventilation. Gases and dust – Explosives and blasting – Lighting – Winding – Machinery – Pressure vessels, compressors and refrigeration plants – Electricity – Protective equipment, clothing and devices – Mine fires – First Aid – Miscellaneous	Mines Inspector Erongo Region
Labour	Labour Act 11 of 2007 Health and Safety Regulations (HSR) GN 156/1997 (GG 1617).	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations.	Labour Law Advice: Tel: 061 309 957
Roads	Roads Ordinance 17	– Width of proclaimed roads and road reserve boundaries (S3.1)	Mr. E. de Paauw Tel: (061) 284 7027

		– Control of traffic on urban trunk and main roads (S27.1) – Rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads (S36.1) – Infringements and obstructions on and interference with proclaimed roads. (S37.1) – Distance from proclaimed roads at which fences are erected (S38).	
Water	Water Act 54 of 1956	Section 21 details provisions relating to effluent discharge permits.	Mr. Witbooi (MWAF): Tel: (061) 208 7226
	Water Quality Guidelines for Drinking Water and Waste Water Treatment	Details specific quantities in terms of water quality determinants, which waste water, should be treated to before being discharged into the environment	
Mining	The Minerals (Prospecting and Mining) Act of 1992 and the Minerals Policy (2003)	Make provision for the registration of different types of mineral license and mining claims. The Minerals Policy in particular, as it also provides the basis for the registration of mining claims	Ministry of Mines and Energy, Windhoek

5. PLANNING AND DESIGN PHASE

The management requirements detailed in the table below need to be carried out before any tender documents are drafted for the construction of services infrastructure while necessary preliminary legislative and administrative arrangements are made in preparation for the sale of gemstones / semi-precious minerals. These management requirements are also applicable for the period during which engineering designs/drawings are carried out.

Table 2: Management Requirements for the Planning and Design Phase

ASPECT	MANAGEMENT REQUIREMENT
Solid Waste Management	A suitable solid waste disposal site should be identified and a separate EA should be conducted for that site. This EA should consider as a minimum the following: – The Minimum Requirements for Waste Disposal by Landfill should be adhered to – Mine closure should not pose a threat to groundwater resources (as well as water and sewerage reticulation systems). – Given the prevailing wind direction of south-west it is recommended that the sites be located to the north of the mine. – The new solid waste facilities should incorporate recycling into their waste management system. – In the event that the mine is closed before a suitable location for a new solid waste disposal site is found, a health inspector from the Ministry of Health and Social Services (or private health assessment professional) should determine a minimum safe residential distance from the waste site. The existing solid waste disposal sites should be rehabilitated according to the Minimum Requirements for Waste Disposal by Landfill.
Blasting / Explosives Management	A Blasting / Explosive Management Plan should be developed for all planned developments. The mine will employ explosives as the primary means of breaking rocks, and the Plan should outline management practices to be employed at the Mine that are aimed at minimizing the safety and environmental risks of handling nitrates, which are present in blasting agents. Specifically, methods used to minimize nitrate losses to the environment will be explained. in addition, the following design and loading practices should be put in place to minimize ammonia / nitrate losses to the environment: - **Design considerations:** blasts are designed to maximize efficiency of blasting agents. - **Blast hole liners**: liners are used even when minimal amounts of water are present. If there is excessive water, blasters will use emulsion instead. - **Minimize sleep time:** holes are not loaded with blasting agents until necessary in order to reduce the time elapsed between loading and detonation. - **Waste disposal**: Disposal of blasting reagent packaging and related waste is done so in accordance with the Disposal Guidance document
Sewage Reticulation	– The construction / mining activities will have to adhere to and comply with the South African Bureau of Standards 1200 for sewer pipe designs.
Stormwater Infrastructure	A Stormwater Management Plan should be developed for all planned developments and should address as a minimum the following: – Cumulative stormwater issues: Existing stormwater drainage bottlenecks

	– Previously established residential areas with no formalized stormwater drainage – Ensure that the stormwater system is separate from the sewerage system. – Canalizing of run-off with concrete should be avoided as far as possible and natural run-off surfaces utilized or enhanced. – Storm water channels should be accommodated next to roads in the reserve. – Where practical/feasible consider soft/permeable road shoulder options – minimise paved or impermeable areas. – Run-off from areas where surface water might become contaminated should be captured, detained and treated to sewage effluent standards.
Borrow Pits	Existing borrow pits should each have their own ECC. Currently this is not the case and as such an EA should be conducted for each of these borrow pits.
Biodiversity and Aesthetics	All trees (a "tree" is defined as an *"indigenous woody perennial plant with a trunk diameter ≥150 mm")* that occur within the site and immediate environment, which have not been officially surveyed by a registered land surveyor, should be surveyed and incorporated into the Geographic Information System (GIS). In this way, these trees will form part of the Town Planning Scheme and their preservation can thus receive legal force.
Road Infrastructure	The following should be adhered to with respect to any development near Roads Authority declared roads: – There is a 45 metre building restriction applicable along Trunk Road 0701, measured from the centerline of the road. – The road reserve width is 60 metres (measured 30 metres to each side of the centerline of the trunk road). – The 15 metre wide area between the road reserve line and the site boundaries restriction line needs to be declared as public open space.
Maintenance of Services Infrastructure	Ensure that a sufficient number of qualitied staff are appointed to cater for increased demand for infrastructure maintenance (particularly stormwater, wastewater and potable water reticulation) upon completion of construction of such services.
EMP Implementation	The Contractor / Miner needs to appoint an Employer's Representative (ER) (or assign the role to an existing staff member) that will act as the on-site implementing agent. This person should be responsible to ensure that the contractor's responsibilities are executed in compliance with relevant legislation and this EMP.

6. CONSTRUCTION / BLASTING / MINING TENDER PREPARATION PHASE

The management requirements described below should be consulted and carried out when the construction tender documents for the services infrastructure are prepared.

Table 3: Construction / Mining Tender Preparation Phase Management Requirements

ASPECT	MANAGEMENT REQUIREMENTS
EMP implementation	Relevant sections of this EMP should be included in the tender documents for all development so that tenderers can make provision for the implementation of the EMP: – Construction of services infrastructure (**Table 5**) – Maintenance of services infrastructure (**Table 6**)
Financial provision	– Financial provision for the compilation of a Waste Management Plan should be included as a cost item within tenders concerning the construction / mining and/or maintenance of services infrastructure. – Financial provision for topsoil management and the rehabilitation of exhausted borrow pits should be included as a cost item within construction tender documents. – Financial provision for the co-opting of a health officer from the Ministry of Health and Social Services to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase should be included as a cost item within construction tender documents. – Financial provision for the facilitation of an induction programme for senior and temporary construction personnel as well as subcontractors and associated personnel should be included as a cost item within tenders concerning the construction and/or maintenance of services infrastructure. – Financial provision for the compilation of a Tree Management Plan should be included as a cost item within construction tender documents. – Financial provision for the drafting of a Communication Plan should be included as a cost item within construction tender documents.

Recruitment	– Provisions designed to maximize the use of local labour should be included within tender documents concerning the construction and/or maintenance of services infrastructure. – A provision stating that all unskilled labour should be sourced from local communities should be included within tenders concerning the construction and/or maintenance of services infrastructure. – Specific recruitment procedures ensuring qualified local companies enjoy preference during tender adjudication should be included within tenders concerning the construction and/or maintenance of services infrastructure. – Provisions promoting gender equality pertaining to recruitment should be included within tender documents concerning the construction and/or maintenance of services infrastructure. – Women should be given preference for certain unskilled jobs (e.g. flag bearers).

7. CONSTRUCTION / BLASTING / MINING MITIGATION DETAILS

The following table provides a large scale overview of all the major environmental management themes pertaining to both generic and site specific construction mitigation details. This table serves to act as quick reference, for the detailed mitigation details that follow below, for the implementation of the construction / blasting / mining component of this EMP. This chapter may be used as a guide when developing EMPs for other construction activities within the development areas in question.

Table 4: Generic and Site-Specific Environmental Management Actions for the Construction / Blasting / Mining Phase

MITIGATION ISSUE	OBJECTIVE TO BE ATTAINED	GENERIC MITIGATION DEATILS
– **Waste Management**	Avoid and where not possible minimise all pollution associated with construction / mining.	**Section 1**
– **Borrow Pits (if any)**	Ensure topsoil protection and post-blasting / construction / mining rehabilitation.	**Section 2**

MITIGATION ISSUE	OBJECTIVE TO BE ATTAINED	GENERIC MITIGATION DEATILS
– **Health and Safety**	Safeguard health and safety of labourers and general public.	**Section 3**
– **Dust and Noise**	Avoid and where not possible minimize dust and noise associated with blasting / construction / mining.	**Section 4**
– **Environmental Awareness and Training**	Awareness creation regarding the provisions of the EMP as well as importance of safeguarding environmental resources.	**Section 5**
– **Employment Creation and Recruitment**	Minimise negative conflict through legal and fair recruitment practices (affirmative Repositioning)	**Section 6**
– **Stakeholder Communication**	Provide a platform for stakeholders to raise grievances and receive feedback and hence inimize negative conflict	**Section 7**
– **Socio-Economic and Miscellaneous**	Ensure due consideration is given to matters regarding the cultural and general wellbeing of the affected community and matters incidental thereto.	**Section 8**
– **Blasting / Explosives Management**	Minimizing the safety and environmental risks of handling nitrates, which are present in blasting agents. Specifically, methods used to minimize nitrate losses to the environment will monitored.	**Section 9**

7.1 SECTION 1: WASTE MANAGEMENT

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Waste management plan	The Contractor / Miner should compile a Waste Management Plan which should address as a minimum the mitigation measures included below.
Hazardous waste	– All heavy construction / mining vehicles and equipment on site should be provided with a drip tray (though this is very unlikely considering the nature of the developments).

	– Drip trays are to be transported with vehicles wherever they go. – Drip trays should be cleaned daily and spillage handled, stored and disposed of as hazardous waste. – All heavy construction / mining – vehicles should be maintained regularly to prevent oil leakages. – Maintenance and washing of construction / mining vehicles and equipment should be take place only at a designated workshop area. – The temporary workshop areas should be lined with concrete and sloped so as to collect and detain all run-off. – The workshops should have an oil-water separator for collected run-off from washing. – Spilled cement and/or concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers. – All hazardous substances (e.g. fuel etc.) or chemicals should be stored in a specific location on an impermeable surface that is bunded.
Sewage and Grey Water	– Sewage should not be discharged directly onto open soil. – All sewage must be removed regularly and disposed of at a recognized (municipal) sewage treatment facility. – The water collected from wash basins and showers (grey water), should not be left standing for long periods of time as this promotes parasite and bacterial proliferation. Grey water should be recycled: o Used for dust suppression; o Used to water a vegetable garden, or to support a small nursery; o Used to clean equipment. – Grey water that is not recycled should be removed along with sewage on a regular basis.
General Waste	– The construction / mining sites should be kept tidy at all times. All domestic and general construction waste produced on a daily basis should be cleaned and contained daily. – No waste may be buried or burned. – Waste containers (bins) should be emptied regularly and removed from site to a recognized (municipal) waste

	disposal site. All recyclable waste needs to be taken to the nearest recycling depot. – A sufficient number of separate bins for hazardous and domestic/general waste must be provided on sites. These should be clearly marked as such. – Construction / mining labourers should be sensitized to dispose of waste in a responsible manner and not to litter. – No waste may remain on site after the completion of the project

7.2 SECTION 2: BORROW PITS (IF ANY) & EXCAVATION / MINING / BLASTING

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Topsoil	– When excavating, topsoil should be stockpiled in a demarcated area. – Stockpiled topsoil should be used to rehabilitate the nearest borrow area (existing borrow pits), if such an area is located less than 20 km from the stockpile.
Mining	– The Contractor should closely work with the Mining and Construction companies that will do the mining on the Claims. – Well serviced / maintained Machinery (with Service History) to be used include: o MAN Tipper Truck o CAT Loader o Atlas Copco Air Compressors o Bakkies – Anfax and fuses will be used for the blasting purposes
Rehabilitation	– Upon completion of the construction / mining phase consultations should be held with the local community/property owner(s) regarding the post-mining use of exhausted pits. – In the event that no post- construction uses are requested, all exhausted borrow pits and excavated areas need to be rehabilitated as follows: ▪ Borrow pits and excavated areas may only be backfilled with clean or inert fill. No material of hazardous nature (e.g. sand removed with an oil spill) may be dumped as backfill.

	▪ Rehabilitated borrow pits and excavated areas need to match the contours of the existing landscape. ▪ The rehabilitated area should not be higher (or lower) than nearby drainage channels. This ensures the efficiency of re-vegetation and reduces the chances of potential erosion. ▪ Topsoil is to be spread across borrow pit and excavated areas evenly. ▪ Deep ripping is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall. ▪ Ripping should be done along slopes, not up and down a slope which could lead to enhanced erosion. ▪ Rehabilitated borrow pits need to remain fenced-off after the decommissioning of the project to prevent livestock from denuding the newly established vegetation on the area.

7.3 SECTION 3: HEALTH AND SAFETY

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
HIV/AIDS and TB training	The Contractor/ Miner should approach the Ministry of Health and Social Services (Usako Health Centre) to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction/mining phase.
Road Safety	– Demarcate roads clearly. – All vehicles that transport materials to and from the site must be roadworthy. – Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. – Loads upon vehicles should be properly secured to avoid items falling off the vehicle.
Safety Around Excavated and Work Areas	– Excavations should be left open for shortest time possible. – Excavate short lengths of trenches and box areas for services or foundations in such a way that the trench will not be left unattended for more than 24 hours. – The following areas should be demarcated with danger tape: o All excavation works;

	○ Soil and other building material stockpiles; and ○ Temporary waste stockpiles. – Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active. – Borrow pits are to be fenced-off with steel wire fencing. – Work areas must be set out and isolated with danger tape on a daily basis. – All building materials and equipment are to be stored only within set out and demarcated work areas. – Only construction/mining personnel will be allowed within these work areas. – 2 fire extinguishers should be available at fuel storage areas. – Comply with all mitigation measures laid out in **Section 1** (Waste Management Mitigation details)
Ablution Facilities	– Separate toilets should be available for men and women and should clearly be indicated as such (if applicable). – Portable toilets (i.e. easily transportable) should be available at every construction site: ○ 1 toilet for every 25 females. ○ 1 toilet for every 50 males. – Sewage needs to be removed on a regular basis to an approved (municipal) sewage disposal site. Alternatively, sewage may be pumped into sealable containers and stored until it can be removed. – Workers responsible for cleaning the toilets should be provided with latex gloves and musks.
General Precautions	– Dust protection masks should be provided to workers at all the time despite worker's resistance to use them. – Sufficient potable water reserves should be available to workers at all times. – No person should be allowed to smoke close to fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable). – No workers should be allowed to drink alcohol during work hours. – No workers should be allowed on site if under the influence of alcohol.

7.4 SECTION 4: DUST AND NOISE

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Dust	A watering truck should be used on gravel roads and the site especially during dry and windy conditions. However, due consideration should be given to water restrictions during times of drought.
Noise	Work hours should be restricted to between 08h00 and 17h00 where construction / mining involving the use of heavy equipment, power tools and the movement of heavy vehicles is less than 500 m from residential areas. If an exception to this provision is required, all residents within the 500 m radius should be given 1 week's written notice.

7.5 SECTION 5: ENVIRONMENTAL AWARENESS AND TRAINING

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Environmental Induction (Training)	All construction / mining workers are to undergo environmental induction (training) which should include as a minimum the following: – Explanation of the importance of complying with the EMP. – Discussion of the potential environmental impacts of construction / mining activities. – Employees' roles and responsibilities, including emergency preparedness. – Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. – Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions.

7.6 SECTION 6: EMPLOYMENT CREATION AND RECRUITMENT

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Legislation	Adhere to the legal provisions in the Labour Act (see **Table 1**) for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract.

Recruitment	The Contractor / Miner should compile a formal recruitment process including the following provisions as a minimum: – Recruitment should not take place at the mine – Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. – Contractors / Miners should give preference in terms of recruitment of sub-contractors and individual labourers to those who are qualified and from the project area and only then look to surrounding towns. – Clearly explain to all job-seekers the terms and conditions of their respective employment contracts (e.g. period of employment etc.) – make use of interpreters where necessary.

7.7 SECTION 7: STAKEHOLDER COMMUNICATION

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Communication plan	The Contractor/Miner should draft a Communication Plan, which should outline as a minimum the following: – How Interested and Affected Parties (I&APs), who require ongoing communication for the duration of the construction period, will be identified and recorded and who will manage and update these records; – How these I&APs will be consulted on an ongoing basis; – Make provision for grievance mechanisms – i.e. how concerns can be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event that feedback is deemed unsatisfactory.
General communication matters	– The ER must appoint an ECO to liaise between the Contractor / Miner, I&Aps and consultants. – The Miner shall at every monthly site meeting report on the status of the implementation of all provisions of the EMP. – The Miner should implement the environmental awareness training as stipulated in **Section 5** (see above). – The Miner must list the I&APs of the project and their contact details with whom ongoing communication would be required for duration of the contract. This list, together with

	the Communication Plan must be agreed upon and given to the ER before construction commences. – The Communication Plan, once agreed upon by the Miner, shall be legally binding. – All communication with the I&APs must take place through the ECO. – A copy of the EMP must be available at the Mine Site Office and should be accessible to all I&APs – Key representatives from the above mentioned list need to be invited to attend monthly site meetings to raise any concerns and issues regarding project progress. – The Contractor should liaise with the Developer regarding all issues related to community consultation and negotiation before construction commences. – A procedure should be put in place to ensure that concerns raised have been followed-up and addressed. – All people on the I&APs list should be informed about the availability of the complaints register and associated grievance mechanisms in writing by the ER prior to the commencement of construction activities.

7.8 SECTION 8: SOCIO-ECONOMIC AND MISCELLANEOUS

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Archaeology	– Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a "chance find" procedure should be applied in the order they appear below: o If operating machinery or equipment stop work; o Demarcate the site with danger tape; o Determine GPS position if possible; o Report findings to the construction foreman; o Report findings, site location and actions taken to superintendent; o Cease any works in immediate vicinity; o Visit site and determine whether work can proceed without damage to findings; o Determine and demarcate exclusion boundary;

	○ Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; ○ Inspect site and confirm addition to project GIS; ○ Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and ○ Recovery, packaging and labeling of findings for transfer to National Museum. – Should human remains be found, the following actions will be required: ○ Apply the chance find procedure as described above; ○ Schedule a field inspection with an archaeologist to confirm that remains are human; ○ Advise and liaise with the NHC and Police; and ○ Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.

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7.9 SECTION 9: BLASTING / EXPLOSIVES MANAGEMENT

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
Blasting / Explosives management plan	The Contractor / Miner should compile a Blasting / Explosives Management Plan which should aim at minimizing the safety and environmental risks of handling nitrates, which are present in blasting agents. Specifically, methods used to minimize nitrate losses to the environment will be explained in the Plan.
Best Practice Management Practices	The Miner should work closely with both AEL Blasting Services who will be directly responsible for transporting of explosives as well as do the actual blasting – Holes to be drilled by Air Jackhammers – The CAT Backholder to be used to clean – All holes to be cleaned with Air Compressors This will help ensure that Blasting activities are conducted with minimal environmental and health/safety risk. Since both safety and environmental risks are related (risks are increased from deficient handling practices), standard operating procedures (SOPs) should be developed which address both issues jointly.

	– The first means of addressing explosive reagent safety and best practices related to environmental management is awareness. – Blast crews and engineering staff should be aware that nitrates and ammonia are generally the compounds of greatest concern for water quality

8. OPERATION AND MAINTENANCE PHASE

The following mitigation measures should be complied with and carried out during any maintenance works associated with the services infrastructure within the planned development areas.

Table 5: Operation and Maintenance Phase Mitigation Measures

MITIGATION ASPECT	PROPOSED MITIGATION ACTION
EMP Implementation	– If any mining / blasting is to be conducted as part of maintenance works for the services infrastructure within the project area please refer to the construction / mining mitigation measures of this EMP (**Chapter 7**).
Post-Construction / Mining Usage of Borrow Pits	– Borrow / pits to be rehabilitated during the post-construction / mining phase - adhere to the same topsoil and rehabilitation measures outlined within construction mitigation measures of this EMP (**Chapter 7**) above.
Post-Construction / Mining Environmental Training and Awareness	– All contractors appointed for maintenance work on the respective services infrastructure must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.

9. DECOMMISSIONING

In the event that the mines are decommissioned the following mitigation measures should be adhered to.

Table 6: Decommissioning Phase Mitigation Measures

ASPECT	MITIGATION MEASURE
Construction Related Activities	– Many of the mitigation measures prescribed for mining activity for these developments (Chapter 7 above) would be applicable to some of the decommissioning activities. These should be adhered to where applicable.
Rehabilitation	– In the event that decommissioning is deemed necessary, excavations need to be rehabilitated according to Section B of Chapter 7 (see above).