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Draft Environmental Management Plan (EMP) for the:

Proposed Exploration and Quarrying of Dimension Stone on Mining Claim 68945, Daures Constituency, Erongo Region, Namibia

MEFT APPLICATION NO.:	**APP- 003576**
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CC:	Close Corporation
CFP	Chance Finds Procedure
DEAF	Department of Environmental Affairs and Forestry
DTH:	Down-The-Hole drilling
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMA	Environmental Management Act
ECC	Environmental Clearance Certificate
I&APs	Interested and Affected Parties
MC	Mining Claim
MAWLR	Ministry of Agriculture, Water & Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NHC	National Heritage Council of Namibia

1 INTRODUCTION

1.1 Brief Project Background and Location

Mr. Jacobus Zandberg (hereinafter referred to as the Proponent), is the sole holder of Mining Claim 68945 and intends to undertake prospecting and eventual mining or quarrying of dimension stones (dolerites, red granites and marbles) on a small to medium scale. The Mining Claim (MC) 68945 is located about 80 km northeast of Swakopmund, 50 km southeast of Henties Bay, approximately 65 km northwest of Arandis **(**Error! Reference source not found.). It lies on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency, and about 20 km northwest of the Trekkopje Mine as seen in Error! Reference source not found..

The GPS coordinates of the mining claim is presented in **Table 1-1**.

Table 1-1: Approximate GPS Coordinates of Mining Claim 68945.

Mining Claim	**Latitude**	**Longitude**
68945	-22.022863°	14.717340°
	-22.018967°	14.722520°
	-22.020849°	14.724181°
	-22.024582°	14.720124°

The mining claim is on the part of the constituency which has no human occupation. The closest community is in Marenica, located about 20 km to the east, and the Farms Hakskeen, Sukses and Trekkopje all in excess of 20 km as seen in **Figure 1 3.** The area is under the leadership of the Oe#Gan Traditional Authority.

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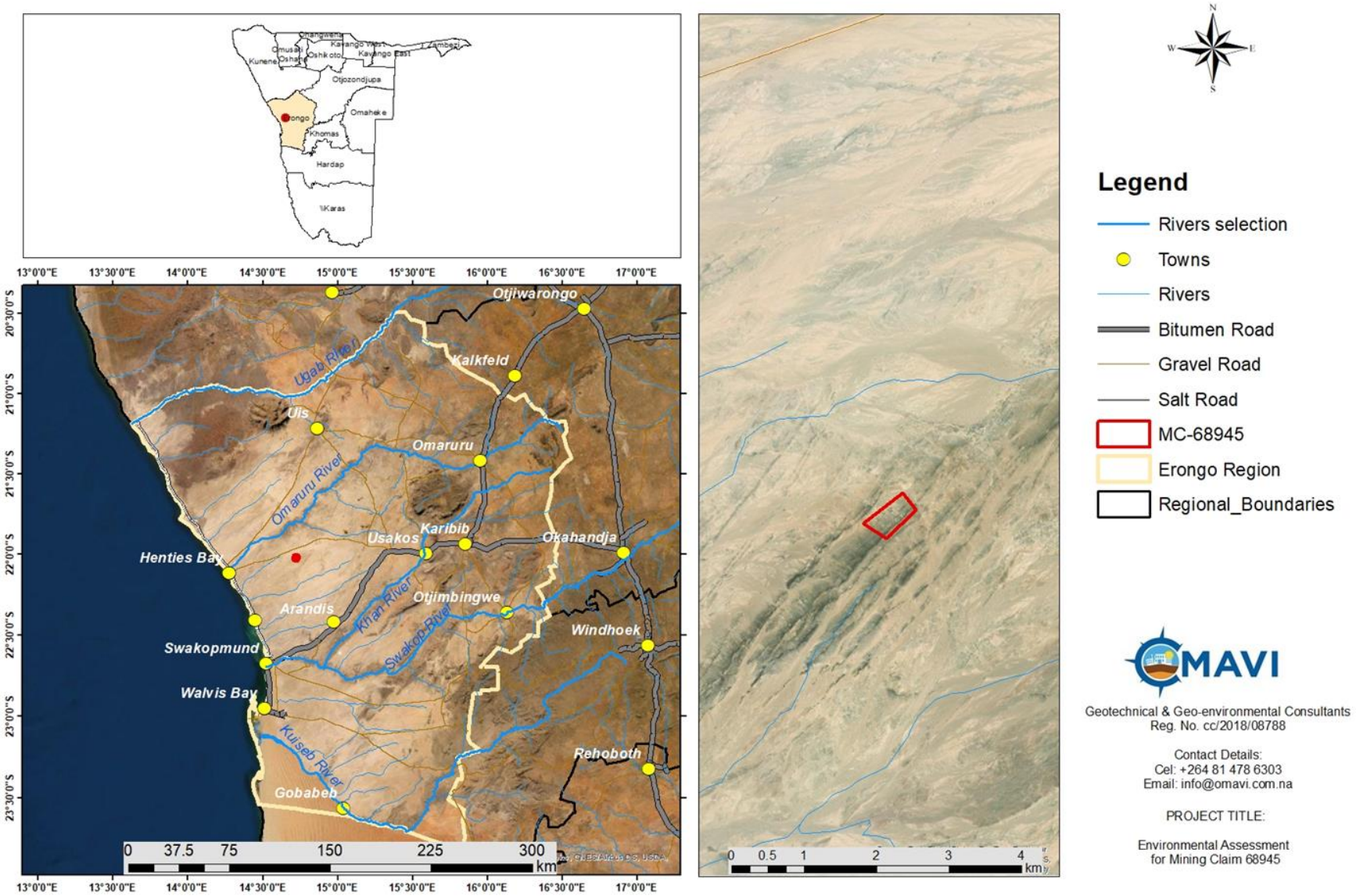

Figure 1-1: The location of Mining Claim 68945, relative to neighbouring major towns of Swakopmund, Henties Bay, and Arandis in the Erongo Region.

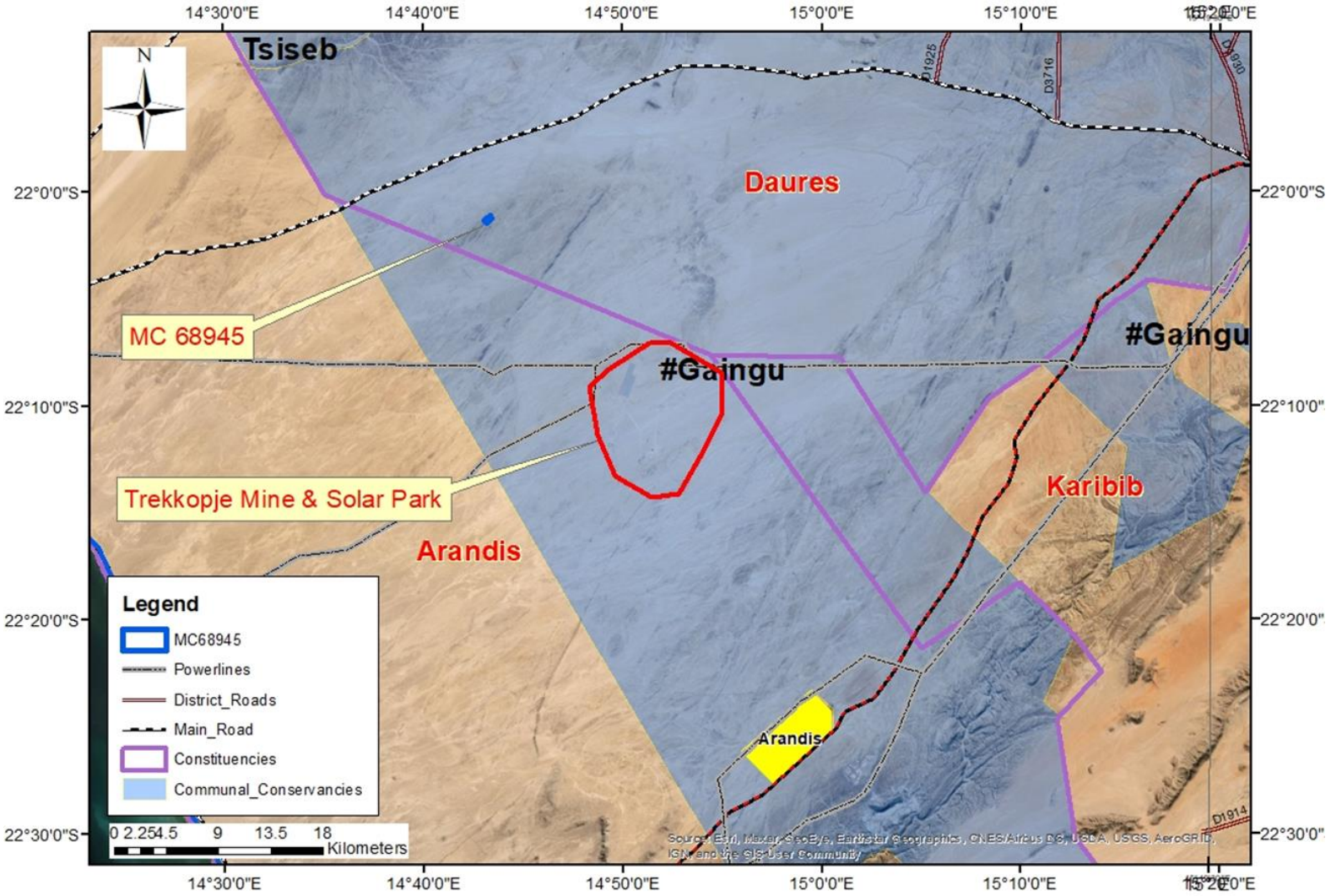

Figure 1-2: The location of MC 68945 on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency, about 20 km northwest of the Trekkopje Mine and Solar Farm.

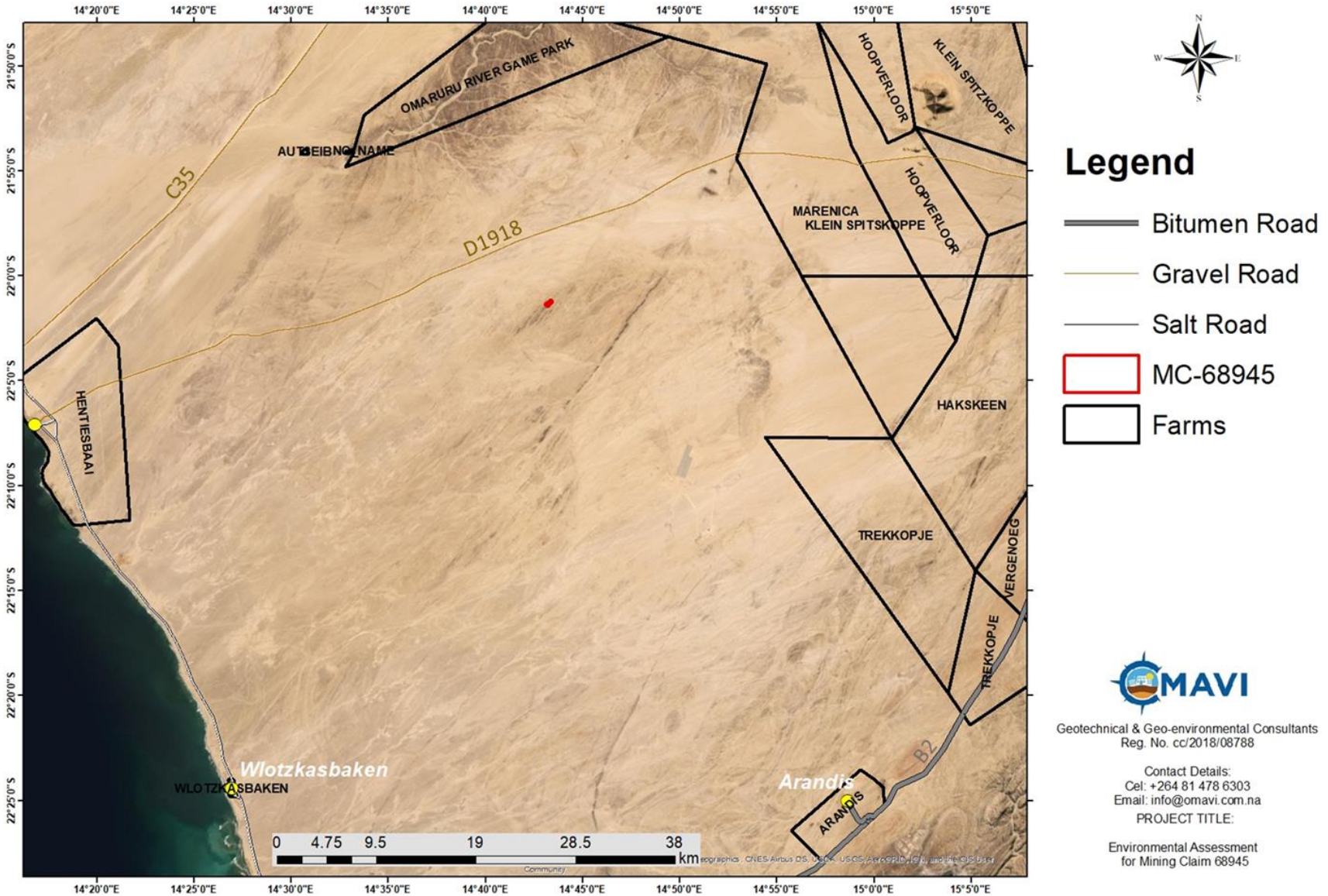

Figure 1-3 The location of MC-68945 relative to the closest farms and communities.

1.2 The Mining Claims Ownership

The Mining Claim (MC) 68945 on which the exploration and quarrying activities are proposed to be undertaken is solely owned by Mr. Jacobus Zandberg, who holds several other prospecting and mining rights and has vast experience in the prospecting and quarrying of dimension stone.

The licence was granted by the Ministry of Mines and Energy (MME) for the exploration of dimension stones in 2013, however, no intrusive work was done on this mining claim due to low market demands for the target commodities until the tenure ran out in 2016. Therefore, the current status of this licence is pending renewal, which is subject to the issuance of an environmental clearance certificate (ECC) by the Ministry of Environment, Forestry and Tourism (MEFT), hence the need for an environmental scoping assessment and the present EMP.

The status of Mining Claim (MC) 68945 is shown in Error! Reference source not found. below as accessed on 23 June 2022 on the Namibia Mining Cadastral Portal (upon searching) on this link https://portals.landfolio.com/namibia/.

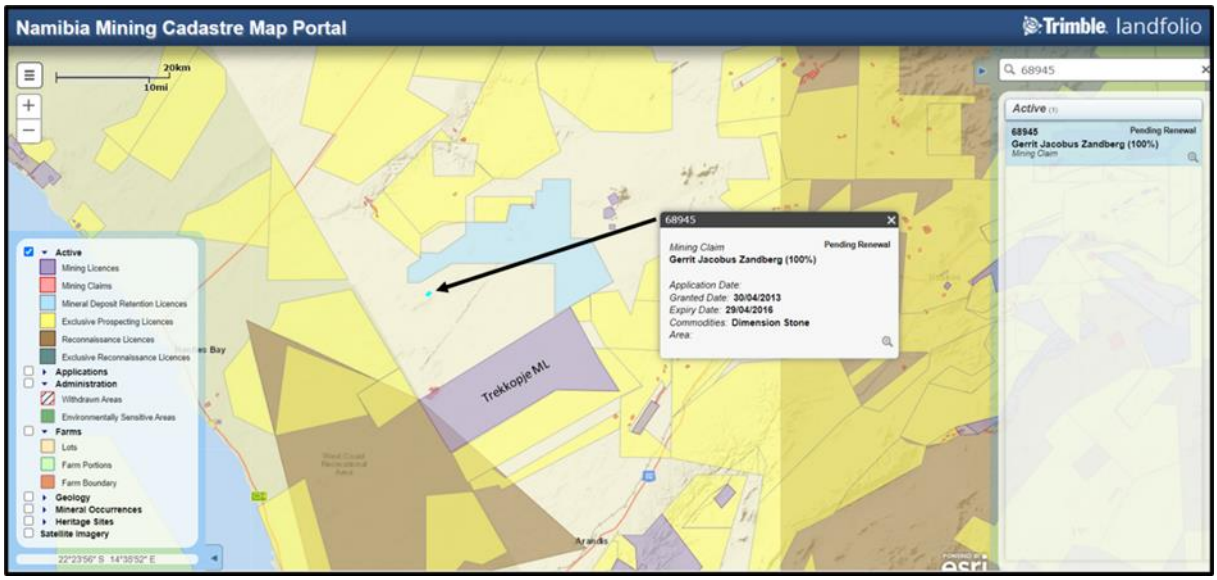

Figure 1-4: Details of Mining Claim (MC) 68945 as displayed on the Namibia Mining Portal (As accessed on 03 June 2022 via: https://portals.landfolio.com/namibia/). The location of Trekkopje Mine has been added for orientation.

1.3 Purpose of the Environmental Management Plan (EMP)

Regulation 8 of the Environmental Management Act's (EMA) (7 of 2007) Environmental Impact Assessment Regulations (2012) requires that a draft Environmental Management Plan (EMP) be included as part of the scoping Environmental Assessment (EA) process. A 'management plan' is defined as:

"*…a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored.*"

An EMP is one of the most important outputs of the EA process as it synthesises all the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the environmental assessment process and the required environmental management on the ground during project implementation and subsequent operations. **It is important to note that an EMP is a legally binding document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and should be amended to adapt to project changes and/or environmental conditions and feedback from compliance monitoring.**

The purpose of this document is therefore to guide environmental management throughout the following life-cycle stages of the proposed phases. The project phases are addressed in this EMP are as follows:

- **Planning** - the period during which preliminary legislative and administrative arrangements are carried out in preparation of exploration activities and mining activities. The components that form part of this phase include obtaining land access agreements (consents) from landowners/occupiers, the preparation of sites to be explored, setting up project infrastructure
- **Exploration** – during this phase, evaluation will be carried out by a competent and qualified geologist, to locate suitable outcrops in the field and subsequently delineating sites that potentially have good quality dimension stones (dolerites, granites and marbles). Sample blocks will also be extracted for property testing during test quarrying.
- **Mining/quarrying phase** - the period during which the verified sites on the mining claim will be prepared for mining. Blocks of dimension stone will be extracted from the verified and a quarry will be developed. This is also the phase during which the worksites, project infrastructure, vehicles, equipment, and machinery will be maintained by the Proponent, as deemed necessary.
- **Decommissioning and rehabilitation** – once mining is completed, following the depletion of the quality dolerite and granite deposit, or should mining works be ceased. Rehabilitation will be done on explored and mined-out areas, to compliment the progressive rehabilitation that was taking place concurrently with exploration and mining, as an attempt to restore the environment. This will also entail the dismantling and removal of campsites, and associated structures from the project sites and area.

1.4 The Environmental Consultant

In accordance with the Environmental Management Act (2007) of Namibia and its Regulations of 2012, Mr. Jacobus Zandberg, (the proponent) appointed OMAVI Geo-technical & Geo-Environmental consultants cc (hereinafter referred to as OMAVI or OMAVI Consultants) as an independent environmental consultant to conduct an Environmental Scoping Assessment and submit the required documents as part of an application for an Environmental Clearance Certificate (ECC) to the Environmental Commissioner. This EMP is one of the required documentations to the ECC application.

1.5 Limitations of the Draft Environmental Management Plan (EMP)

The following assumptions apply to this EMP:

- This EMP has been compiled based on the scoping assessment for which an Archaeological Impact Assessment has been undertaken. No other specialist studies were done as part of the scoping assessment and development of this EMP. With regards to cumulative impacts identified for the project activities, OMAVI consultants provided mitigation measures that will be implemented by the proponent to reduce the impacts' significance of their activities, thus improving on / not adding onto the existing/cumulative impacts. The project specific information used in this document is as provided by the Proponent, site observations, OMAVI Consultants experience and relevant literature.
- OMAVI Consultants assumes that all the project technical information and data provided by the Proponent is correct and accurate, and that all necessary information has been disclosed which led to the development of this EMP.
- It is also assumed that the relevant information obtained from different literature consulted is accurate; and
- This EMP has been compiled on an assumption that there will be no significant changes to the proposed project activities or the affected biophysical and social environment between the time of compiling this EMP and implementation of the proposed project that could substantially influence findings of this document; and
- It is also assumed that there will be no significant changes to the project activities that could substantially influence the plan actions provided herein that are aimed at the management and protection of the biophysical and social environment.

2 BRIEF PROJECT DESCRIPTION, ACTIVITIES AND PROCESSES

As part of exploration, works on MC 68945 will adopt a systematic prospecting approach in search for dimension stones, particularly dolerites, red granites and marbles. This section discusses the activities to be undertaken for both exploration and mining stages as well as the required and associated infrastructure. It must be noted that these proposed activities are only to be undertaken once the ECC has been granted by the Environmental Commissioner.

2.1 Resource Inputs and associated infrastructure (Exploration and Mining)

2.1.1 Temporary shelter / accommodation

The exploration team will comprise about ten (10) people, including skilled, semi-skilled and unskilled, personnel, and this number is expected to increase in the mining phase to about twenty (20) people. Priority for employment will be given to the locals and only specialized skills will be imported.

At both exploration and mining, temporary camps will be set up to accommodate the team onsite. It will primarily be an erection of tented facilities or prefabricated structures, with an option to lease farm infrastructure. Other temporary structures would be for office and storage space. All this will take place subject to approval by the farmer or landowners. **Therefore, the proponent and the landowners through their leadership (!Oe#Gan Traditional Authority) will need to have agreements in place prior to the commencement of the exploration project**.

2.1.2 Vehicles, Machinery and Equipment

Exploration and mining: These will include 4 x 4 bakkies, front-end loader pickup and dump trucks, Down-The-Hole (DTH) drill rig, air compressor machine, butterfly cutter, trucks, diamond wire-saw cutter and coring, excavator / front-end loader to scoop up sandy overburden, dozers (to clear land along planned drilling and mining site access roads).

Supporting equipment: Water tanker to cart water to site for exploration and mining works, diesel bowser / tank (bunded) of about 30 000 litres, diesel generator, camping tents, prefabricated office structures, shade structure for near working areas, two-way radios (for communication).

All equipment, machinery and vehicles will be stored at a designated area near the temporary accommodation on site.

2.1.3 Power Requirements (for vehicles, machinery and domestic use)

At exploration and mining stage: It is anticipated that onsite machinery will be diesel powered. A trailer mounted diesel tank of about 2500 to 3000 litres will be kept onsite during

exploration. During the quarrying phase, at least two (2) 10 000 litres fixed tanks will be installed on site near the workshop area as shown in **Figure 2-1** below. Such tanks shall be constructed or installed in accordance with the South African Bureau of Standards (SABS). This fuel/diesel will mainly be used in powering the compressors for surface cleaning, drilling and for cutting machinery as well as vehicles. A diesel bowser truck will be filling the onsite tank, as and when required.

Figure 2-1: An example of a fixed fuel storage tank, installed on paved ground to minimise the risk of pollution.

Power for domestic use will be sourced from photovoltaic rooftop solar panels provided by the proponent. Firewood may also be used, which will be provided by the proponent from an approved firewood supplier, therefore no firewood will be collected onsite or from nearby farms without landowners' or occupiers' permission. **Therefore, no connection will be made to the national power grid**.

2.1.4 Water supply

At exploration stage, a low water demand of about 10 000 litres per week will be required at drilling phase while 20 000 to 30 000 litres per week will be required during the test quarrying phase. This amount is anticipated to increase to about 50 000 to 60 000 litres per week at mining stage. This water will mainly be used support the exploration and mining processes such as down-the-hole drilling, butterfly cutting during exploration, diamond wire saw, cleaning and cooling off exploration and mining equipment.

As a first consideration, an attempt will be made to site and drill a borehole within the mining claim area to meet the water needs of the project. For this, a comprehensive groundwater study for the area will be conducted upon granting of the ECC and prior to the project commencement, to assess the aquifer potential and advise the siting of the borehole. Once drilled pump testing will be carried out to determine the yields and water quality. The

proponent will ensure that all necessary permitting (Groundwater Abstraction and Use Permit (GWAUP) by the Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR)) will be obtained prior to the use of such borehole. However, should poor water strikes be encountered (i.e. no borehole with reasonable yields of at least 2 to 3 m^3 per hour), then alternative water supply options will be considered. One of these options is the carting of water by means of water bowser, either from the Trekkopje Mine (subject to an agreement being reached with the mine operator), or from nearby towns of Arandis/ Usakos or Henties Bay (subject to consent from the relevant town council).

For both exploration and mining, water will be recycled and re-used as an attempt to conserve water. This approach might see a reduction in the amount of water requirements, which will mean lesser amounts to be abstracted or carted.

2.1.5 Roads

The project area (MC 68945) can be accessed from the B2 highway via the D1918 gravel road up to the Trekkopje Mine and thereafter by several small access roads. The project will utilize existing roads and where necessary, temporary informal access routes will be created to gain access to the actual targeted sites. The Proponent may need to do some upgrade on the access roads to ensure that it is fit to accommodate project related vehicles, such as heavy trucks and erect temporary road signs for the duration of the project.

2.1.6 Waste production and sanitation

Waste: Different waste containers will be provided onsite for waste sorting and safe disposal of waste generated onsite. These will be collected on a weekly basis and sent to nearest approved waste management facility in the area.

Sanitation: Movable ablution facilities with septic tanks will be put up for sanitation purposes for the exploration and mining teams and will be emptied in good time according to manufacturers' instructions.

2.1.7 Personnel and site safety

All workers will be equipped with adequate and appropriate personal protective equipment (PPE), that will be replaced or repaired to ensure that workers' occupational health and safety is not compromised. A minimum of two first aid kits will be readily available on site to attend to potential minor injuries.

For safety and security reasons, the localized high-risk working sites will be demarcated and temporarily fenced off. Project vehicles will also be equipped with fire extinguisher as well as at the working sites in case of fire outbreaks.

2.2 Planned Activities: Proposed Exploration Methods

The exploration techniques to be applied can be classified as invasive or non-invasive depending on the impact they can have on the environment. Exploration works will be undertaken as per the following phases:

2.2.1 Desktop Study

The exploration program will commence with a review of geological maps as well as historical drilling and / or quarrying data for the area. This is a non-invasive technique aimed at establishing an environmental baseline.

2.2.2 Field evaluation

Field evaluation will be carried out by a competent and qualified geologist, aimed at locating suitable outcrops in the field and subsequently delineating potential marble units. Marble bodies identified will be ranked in order of priority for follow up exploration based on various factors such as:

- Lateral extent of the marble outcrop and general soundness of the rock,
- Appearance - patterns and colour of the marble, and
- Presence of joints and other discontinuities and their spacing.

At this stage, small hand samples (of about 30 cm^3 in dimension) will be taken for cutting and polishing to provide insight on hardness of the stone and whether the stone can be polished to an acceptable finish. As a product, a geological map of the area will be produced to assist in target generation for subsequent detailed exploration such as drilling and possibly test quarrying.

2.2.3 Detailed exploration

At this stage, down the hole (DTH) drilling will be undertaken in predetermined areas to establish the following:

- Vertical extent of the marble formation.
- Color and texture.
- Joint spacing or
- Possible defects at depth.

This will aid delineation of major geological structures such as fault and shear zones, the extent of veins, frequencies of fracture/ discontinuity, thereby refining the produced geological map. The refined map will then be used to define targets for feasibility or test quarrying. It is anticipated that drilling activities will require a small (6m wide) tracked access roads to gain access to the actual drilling sites for the air compressor and water truck.

2.2.4 Feasibility study: Test Quarrying

Where drilling yields positive results, test quarrying by means of butterfly cutting will be conducted to fully evaluate the recovery of saleable blocks, and better optimize the extraction methods, production rates and operational costs. This test quarrying will only be carried out in selected areas and shall be performed on as small an area as possible to minimize environmental impacts. Topsoil will be stripped and stockpiled in designated fenced off areas for future restoration works.

It is important to note that the test quarrying referred to above is a component of exploration activities, to be done at a small-scale level on targeted sites of the Mining Claim. This will enable the Proponent to get sufficient and reliable data about the rocks. Areas found to comprise good quality rocks in economical volumes will then be delineated, and the proponent will prepare for mining, guided by the Environmental Management Plan (EMP). If no viable resource is found at exploration stage, works will proceed to rehabilitation and decommissioning phase discussed in Section 2.4 to reinstate disturbed sites.

2.3 Planned activities: Proposed Mining Technologies

According to Ashmole and Motloung (2008), dimension stone mining methods themselves generally have a low impact on the surrounding environment due to the need to carefully extract large blocks or slabs without damage to the stone. Recent advances in dimension stone mining technology have also had the effect of reducing environmental impacts.

2.3.1 Quarry development

It is envisaged that quarrying will be conducted using a combination of best practice non-explosive technologies encompassing Down-the-Hole (DTH) rotary air blast drilling, diamond wire-saw cutting and most likely plugs and feathers splitting. This generally will entail loosening of large volumes of the bedrock by means of primary cutting, and subsequent stepwise division into smaller pieces until blocks of a commercial size are obtained, stockpiling waste rock as the process is performed.

The quarry will be developed with a low point, to create a gradient for waterflow, so that water can pond at this low point to allow recycling and re-using of this precious resource.

2.3.2 Block mining and handling

For block recovery, diamond wire saw cutting will be employed. It involves drilling of two intersecting holes, and subsequent passing of the diamond wire through these holes. The diamond wire through the two holes is then joined to form a continuous loop, which is placed over the flywheel of the saw that rotates, driving the diamond wire through the stone. The saw moves backwards along a track to maintain sufficient tension in the wire. This cutting technology has the advantage that it is associated with low noise and dust generation (Chatterjee et al. 2005).

The mined blocks will be transported by flat deck interlink trucks to natural stone processing facilities either in Karibib or Walvis Bay for value addition. Therefore, no processing of the dimension stone blocks will be done onsite.

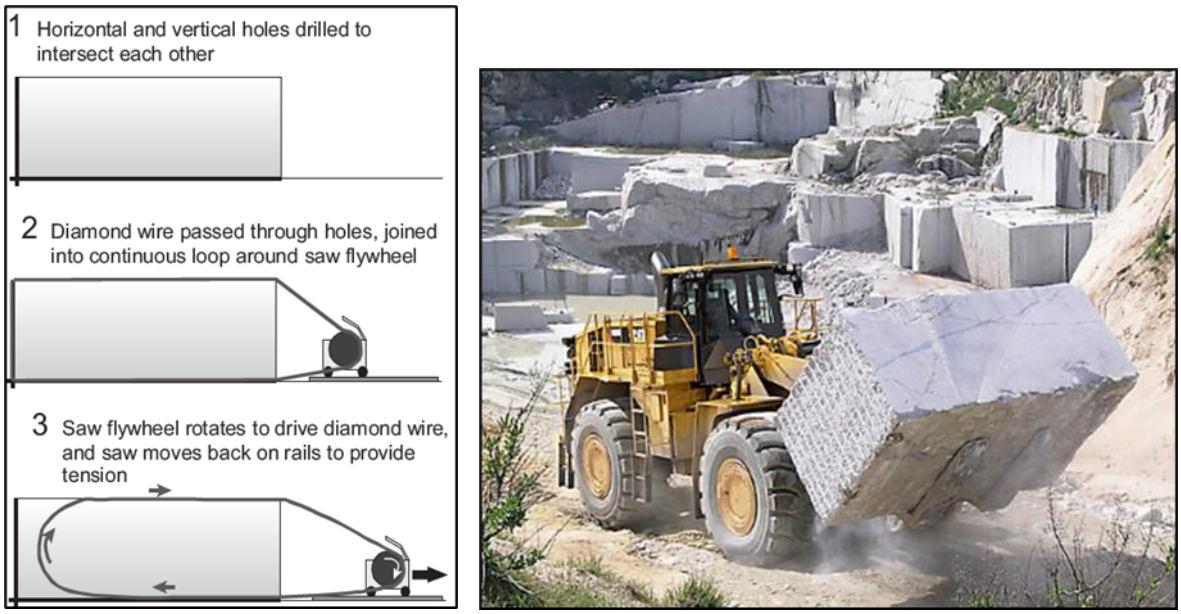

Figure 2-2: Typical mining and quarrying by diamond wire technology (Ashmole and Motloung, 2008).and an example of a front-end block loader.

The annual production figures cannot be established at this stage, only after exploration and deposit evaluation. However, once this information (deposit reserves, annual production planned for mining and ESA/EMP updates) becomes available, it will be communicated to all the registered interested and affected parties of this project. **It must also be noted that once the reserves have been confirmed, a review and update will be done on the current ESA Report and EMP.**

2.4 Rehabilitation and Decommissioning

The impact on the physical environment can be lessened by implementation of progressive / ongoing rehabilitation to be carried out by the Proponent. This will entail for instance rock shading, and partial backfilling with stockpiled topsoil, to ensure that the disturbed sites are reinstated and restored to their pre-exploration state.

Once mining is completed, following the depletion of the quality dolerite and granite deposit, the activities will be decommissioned, and the sites will be rehabilitated to their pre-mining activities as much as possible. This will also entail the dismantling and removal of campsites, and associated structures from the project sites and area.

3 EMP IMPLEMENTATION AND RESPONSIBILITIES

The EMP has identified the Exploration/Mining Manager, Safety, Health and Environment (SHE) Officer and Public Relation Officer (PRO) as important roles to guide the environmental management of the proposed exploration and subsequent mining activities. It should be noted that in practice, however, these roles may be assigned to and performed by one person, due to various foreseen and unforeseen circumstances.

A list of specific responsibilities and duties to be undertaken by each are provided below. It should also be noted that the above-mentioned roles are delegated roles and Mr. Jacobus Zandberg is ultimately responsible for the implementation of the EMP.

3.1 The Exploration and Mining Manager

This Manager (depending on the project phase) who may also be the Proponent, will be responsible for the following:

- Managing/overseeing the implementation of this EMP and updating and maintaining it when necessary.
- Issuing fines to individuals who contravene EMP provisions and if necessary, removing such individuals from site.
- Setting up and managing the schedule for the day-to-day activities.
- Liaison with all relevant interested and affected parties/stakeholders.
- Ensuring all incidents are recorded and documented.
- Undertaking an annual review of the EMP and amending the document when necessary.

3.2 Safety, Health and Environmental (SHE) Officer

The SHE Officer will be responsible for the following activities:

- Planning and carrying out site inductions to the workers on-site and visitors to the worksite(s).
- Ensure that the requirements of the EMP are carried out during applicable activities throughout the project life span.
- Monitor the overall implementation of the EMP.

3.3 Public Relation Officer (PRO)

The Public Relation Officer will be responsible for the following tasks:

- Liaising between the affected farmers (property owners) and/or occupiers of land and Mr. Jacobus Zandberg.
- Ensure effective communication with stakeholders (affected farmers or landowners or occupiers of land), media (if necessary) and the public.
- Managing public relations issues.

- Preparing and submitting public relations reports, if required.
- Collaborating with personnel and maintaining project-related open communication among personnel.

3.4 Environmental Inspectors

Environmental Inspectors from the Office of the Environmental Commissioner will be responsible for enforcing the proposed impact management measures in order to ensure compliance.

3.5 The Conservancy's Leadership and the Traditional Authority

The Conservancy Leadership and Traditional Authorities will represent their communities in the following roles:

- Ensure effective communication with the proponent and deliver on their representation of their respective communities.
- Ensure on behalf of the community that all necessary agreements with land owners and occupiers of land are in place prior to the commencement of the project.
- Ensure that all agreements are honoured by all involved parties, including implementation of the EMP, for the protection of the conservancy and its inhabitants.
- Launch complaints with the proponent on behalf of the community.

3.6 Archaeology: Chance Finds Procedure Implementation Roles

The following personnel have been assigned responsibilities as per the Chance Finds Procedure (**Appendix 1**) provided in the Archaeological Assessment conducted for the proposed activities:

3.6.1 Operator

To exercise due caution if archaeological remains are found

3.6.2 Foreman

To secure site and advise management timeously

3.6.3 Superintendent

To determine safe working boundary and request inspection

3.6.4 Archaeologist

To inspect, identify, advise management, and recover remains.

The Proponent should assess these commitments in detail and should acknowledge their obligation to the specific management actions detailed in the Tables of the following sections.

4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ACTIONS

This chapter presents the environmental and social mitigations measures (management plan actions) and the list of legal requirements in terms of permitting and licensing for certain project activities.

The aim of the management plan actions laid provided in Tables below is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

These management plan actions are a ''translation'' of mitigation measures recommended to manage the potential impacts identified in the project's Environmental Scoping Report.

Apart from the applicable authorizations (licenses and permits) Table, the management plan actions for the planning, exploration and quarry development and mining phase will be presented under one Table with clear indications of phases, if deem necessary. This is done to avoid repletion of information, especially for the exploration and mining where potential impacts may be similar, hence similar management plan actions.

4.1 Applicable Legislation: Authorisation (Permits and Licenses)

This section covers information on the legal obligations (legislations, policies, and guidelines) that governs certain project activities, where permitting and/or licensing may be required from different applicable regulatory authorities - Please refer to **Table 2** below. The full list and description of the legal framework (where permits are required or not) is presented in the Scoping Report.

Table 4-1: Applicable legislations in terms of permits or licenses for the proposed exploration and mining activities

Legislation	Provisions	Contact Details
Environmental Management Act 2007 Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an Environmental Clearance Certificate (ECC). The amendment, transfer, or renewal of the ECC (EMA S39-42; EIAR Regs19 & 20). Amendments to this EMP will require an amendment of the ECC. **The ECC needs to be renewed every 3 years.**	**Mr Damian Nchindo (Ministry of Environment, Forestry and Tourism's Department of Environmental Affairs and Forestry (DEAF) – Chief Conservation Scientist)** **Tel: (061) 284 2701**
The Water Act 54 of 1956 The Water Resources Management Act No. 11 of 2013 (unpromulgated)	The Water Act 54 of 1956 was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas.	**Mr Franciskus Witbooi (Deputy Director: Water Policy and Water Law Administration.** **Tel: (061) 208 7158**

Legislation	Provisions	Contact Details
	Provision for a Groundwater abstraction and use permit for commercial use to be applied for and obtained from the Department of Water Affairs (DWA): Directorate of Water Resources Management. When issued, Proponent, the permit should be renewed as required (as stipulated in therein).	
Mineral Prospecting & Mining Act (Act No. 33 of 1992)	Section 38 (1): Applications for renewal of registration of mining claims The Proponent should ensure that all the necessary permits/authorisation for small/ medium-scale mining such as mining claim renewals are obtained from the Ministry of Mines & Energy (MME)'s Mine Directorate. Section 54(2): details provisions pertaining to the decommissioning or abandonment of a mine	**Mr Erasmus Shivolo (Mining Commissioner)** **Tel: 061 284 8167**
	Under this Act (Section 51 (1a)), holder of a mineral license cannot exercise any rights on a private land until the holder has entered into an agreement with the owner regarding payment of compensation	**The Proponent should enter into and sign access and land use agreement with respective affected farm owners as listed in the Stakeholders' (Interested and Affected Parties) list. Additionally, any of the planned activities may only commence once the mining claims have been renewed.**
Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations	Provides for the control of traffic on public roads and the regulations pertaining to road transport, including the licensing of vehicles and drivers. **A site access road permit from the main road (B2) should be applied for and obtained from the Roads Authority and conditions set therein to be compiled with**	**Mr Eugene de Paauw (Roads Authority – Specialist Road Legislation)** **Tel.: (061) 284 7027**
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	**Carlo Mcleod (Ministry of Mines and Energy: Acting Director – Petroleum Affairs** **Tel.: (061) 284 8291**
Forestry Act (No. 12 of 2001)	Permits are required for the removal of protected plants species.	**The nearest Forestry Office (Ministry of Agriculture Water and Land Reform)** **Mr Johnson Ndokosho (Director: Forestry), Tel: (061) 208 7663**
Nature Conservation Ordinance No. 4 of 1975 (as amended)	Permits are required for the removal of protected plants species.	
National Heritage Act (Act No. 27 of 2004)	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for	**Ms. Erica Ndalikokule (Head: Heritage Management) – National Heritage Council of Namibia** **Tel: (06) 301 903** **OR**

Legislation	Provisions	Contact Details
	application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Section 51 (3) sets out the requirements for impact assessment. Should any objects of heritage significance be identified during the exploration or mining phase, the work must cease immediately in the affected sites and **the necessary steps taken to seek authorisation from the Council**.	**Mr Manfred Gaeb (Regional Heritage Officer) – National Heritage Council of Namibia** **Tel:(061) 301 903**
Labour Act 11 of 2007Health and Safety Regulations (HSR) GN 156/1997 (GG 1617).	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations.	**No permit is required, but adherence to the Act's Relevant Regulations is highly recommended.**

4.2 Planning, Exploration, Quarry Development, Mining and Decommissioning Phases

The management plan actions for the planning, exploration, quarry development, mining and decommissioning phases are presented under **Table 3** below. The Table contains the environmental aspect for which the management actions are required, mitigation measures, key performance indicators, responsible person(s), resources or proof and the timeline of such management actions.

Table 4-2: Management Plan Actions for the Planning, Exploration, Quarry Development and Mining Phases for MC 68945.

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
PLANNING PHASE						
EMP implementation and training	Lack of EMP awareness and implications thereof	A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to respective works on sites. An EMP non-compliance penalty system should be implemented on site. The Proponent should appoint an SHE Officer to be responsible for managing the EMP implementation and monitoring	All required Plans and systems are compiled and in place Safety, Health and Environmental (SHE) Officer is appointed	Proponent	Records of EMP implementation Plans and Systems	Pre-exploration and mining phases (project activities)
Authorizations	Lack of Agreements, Permits/ Licenses	All the required agreements and licenses or permits should be applied for and signed, respectively before commencement of work on the mining claims, or as required The permits, agreements referred to herein include land access & use (by land/farm or property owners) for exploration and subsequent mining activities, borehole siting and drilling permits by both the DWA and property owners, as well as road access and petroleum storage permits	Applicable permits and licenses to obtained from relevant authorities and kept on site for records keeping and future inspections Agreements signed and obtained from landowners or occupiers of land	Proponent and or Exploration/Mining Manager	Permits and License such as road access permit Signed Land Access and Use Agreements	Prior to exploration, quarry development and mining
Communication between the Proponent and landowners or	Lack of and untimely communication (proper liaison) between farmers	The Proponent should appoint a Public Relation Officer (PRO) to liaise with the farmers/landowners. The PRO should be introduced to the farm owners and his or her contact details	A PRO is appointed	PRO	Complaints logbook PRO contact details to be provided to the affected farmers/landowners	PRO appointment (Prior to project activities) and their responsibilities

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
occupiers of land	and Proponent with regards to land use	provided to them prior to undertaking activities for easy communication during the exploration and eventual mining activities. A clear communication procedure/plan which should include a grievance mechanism should be compiled				throughout the project activities
Employment	Creation of employment opportunities	Non-skilled labour should be sourced from the locally affected area, in accordance with procedures approved by the relevant authorities. Equal opportunity should be provided for both men and women.	Number of locals employed for exploration and mining activities	Exploration/Mining Manager	Record of employees	Pre-project activities and when necessary, throughout
Specialised procurement of services	Lack of local procurement of exploration and mining contractors and services	All services related to exploration, quarry development and mining activities such as blasting that the Proponent may need, preference should be given to local providers of such services. If not available locally, the services search should be extended to a Regional level (Erongo Region) and lastly, nationally, or international, if all efforts lead to no success.	Number of hired local contractors	Exploration/Mining Manager	Record of hired or contracted companies or services providers	Pre-project activities and when necessary, throughout
EXPLORATION, QUARRY DEVELOPMENT AND MINING PHASES						
EMP implementation and training	Lack of EMP awareness and implications thereof	EMP trainings should be provided to all new workers on site and to old workers (as a refresher) every 6 months. All site personnel should be aware of necessary health, safety, and environmental	Compliance monitoring conducted monthly for the exploration phase and annually for the mining phase and recorded	SHE Officer	Monitoring reports ECC renewed on time Records of EMP training conducted	Throughout the exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		considerations applicable to their respective work The implementation of this EMP should be monitored. The site should be inspected, and a compliance audit done throughout **the project activities, monthly during the exploration phase** and **annually for the mining phase**. An EMP non-compliance penalty system should be implemented on site.	EMP Refresher training for employees/workers every 6 6 months in both phases Timely renewal of the Environmental Clearance Certificate (ECC) every 3 years			
Communication between the Proponent and landowners or occupiers of land	Lack of communication (proper liaison) between farmers and Proponent with regards to land use	The PRO should be introduced to the farm owners and his or her contact details provided to them prior to undertaking activities for easy communication during the exploration activities and eventual mining. The Proponent should compile a clear communication procedure/plan which should include a grievance and response mechanism. The Proponent should enter into a written agreement with landowners before carrying out exploration and mining activities on their land.	PRO is part of the project personnel	PRO	Complaints logbook PRO contact details to be provided to the affected farmers/landowners	Throughout the project activities
Water Resources Use	Over-abstraction (water demand and availability)	**The Proponent should ensure that a thorough groundwater study is undertaken by an experienced Hydrogeologist prior to the**	The Permit is applied for and obtained from the Authority Compliance with the Permit conditions,	Exploration/Mining Manager	Records of Permit issuance and renewals	Pre-mining phase Throughout the mining phase

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		siting and drilling of any boreholes in the area. **After siting, drilling and installation, a sustainable yield must be determined during the aquifer test (pumping test) by a qualified and experienced Hydrogeologist. Based on this, the Hydrogeologist must recommend a safe (sustainable) abstraction rate for the site to the Proponent to ensure that the local aquifers are not stressed, i.e. not negatively impacted by this local abstraction.** **The proponent must obtain a Groundwater Abstraction and Use Permit (GWAUP) should be applied for and obtained from the national Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR). The Proponent must enforce compliance and adherence to the conditions set out in this Permit including the set objectives (abstraction targets), annual abstraction thresholds and monitoring requirements.**	including timely renewals. Annual submission of water returns to the DWA. Permit to drill a new borehole is obtained and proof kept on site Proof/ recording/ quantification of water saving efforts.		Groundwater Monitoring efforts	

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		However, should it come to light that the drilled borehole cannot supply the minimum water volumes required, then the Proponent will cart water to site for use throughout the life of the project (at both exploration and mining phases). This water will either come from the Trekkopje Mine or from nearby towns of Arandis/ Usakos or Henties Bay. Necessary permissions should be obtained from the mine operator and the relevant town councils respectively. Water should be efficiently used by implementing water saving measures such as recycle and re-use where necessary and possible. This includes using water for cooling exploration and mining equipment for the cleaning of project equipment. Water to be pumped from the borehole on certain days of the week only (not every day) and store the required water in industry standard water tanks on site. This is to avoid abstracting water from the borehole daily (which would stress the aquifers further) and allow the borehole water level some time to recover from the pumping. The site borehole water should be used efficiently, i.e. by limiting water use to the intended project activities only. Water conservation awareness and saving measures training should be provided to all				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		the project workers in both phases so that they understand the importance of conserving water and become accountable. Groundwater Monitoring should be undertaken for the mining phase.				
Soils	Physical soil/land disturbance and loss of topsoil	Overburden should be handled more efficiently during both exploration and mining operations to avoid erosion when subjected erosional processes Prevent creation of huge piles of waste rocks by performing sequential backfilling. Soils that are not within the intended ad targeted footprints of the site should be left undisturbed and soil conservation implemented as far as possible. Project vehicles and machinery should stick to access roads provide and or meant for the project operations but not to unnecessarily create further tracks on site by driving everywhere resulting in soil compaction.	No proliferation of informal vehicle tracks. No new erosion gullies.	SHE Officer	Complaints logbook	Throughout the exploration and mining phases
Soils and water resources	Soils and water resources pollution	Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching groundwater bodies. Some of the soil control preventive measures are:	No complaints of pollutants on the soils and eventually in the water due to exploration and mining activities	SHE Officer	Complaints logbook Waste containers Non-permeable material to cover the ground surface at areas where hydrocarbons and	Throughout exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		-Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites. -Vehicles, machinery, equipment, and fuel storage tanks should be maintained to ensure that they are in good condition thus preventing leaks and spills. -The oil storage and use locations should be visually inspected for container or tank condition and spills. -Maintain a fully provisioned, easily accessed spill kit. Spill kits should be located throughout the active project sites contain the floor dry absorbent material and absorbent booms, pads, mats. These would be suitable for ground surface areas that are covered mainly by hard rocks. -All project employees should be made aware of the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures. -The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible. -Ensure employees receive basic Spill Prevention, Control, and Countermeasure	No visible oil spills on the ground or contaminated/polluted spots.		potential pollutants are utilized.	

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		(SPCC) Plan training and mentor new workers as they get hired in each phase of the project. Exploration and mining site areas where hydrocarbons will be utilized, the surface should be covered with an impermeable plastic liner (e.g. an HDPE liner), carefully placed so as to minimize risk of puncturing, to prevent any spillages from getting into direct contact with the soils and prevent eventual infiltration into the ground. Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated during exploration and mining works. All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites in accordance with MAWLR's Water Environment Division standards on waste discharge into the environment. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the groundwater quality. In cases of accidental fuel or oil spills on the soils from site vehicles, machinery and equipment, the polluted soil should be removed immediately and put in a designate waste type container for later				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		disposal as per the preceding bullet point. The removed polluted soil should either be completely disposed of or cleaned and returned to where it was taken from on site or can be replaced with a cleaner soil. This is to ensure that the pollutants contained int the soil does not infiltrate into the site soils and eventually reach to groundwater. During the mining phase whereby fuel (diesel) storage tanks are fixed in one place, the containment (wall) of same or larger volume as the fuel tanks must be bunded around the tank. This is aimed at preventing accidental fuel spills or leaks from spreading to the soil and eventually to groundwater Although fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer, drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills along the tank trailer path/route around the exploration sites are cleaned on time (soon after the spill has happened).. The fuel storage tank should be placed on a bunded and impervious surface. Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility. Washing of equipment contaminated hydrocarbons, as well as the washing and				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources. Toilet water should be treated using one of the following methods: -discharged into chemical toilets and periodically emptied out before reaching capacity and transported to a wastewater treatment facility. -type of pit latrine (where excreta in the pit is treated to prevent the waste from being a water pollution risk).				
Biodiversity	Loss of Fauna and Flora	**Flora:** The Proponent should avoid unnecessary removal of vegetation, thus promoting a balance between biodiversity and their operations. Vegetation found on the site, but not in the targeted mining areas should not be removed but left to preserve biodiversity on the site. Movement of vehicle and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to the vegetation. No onsite vegetation should cut or used for firewood related to the project's operations. The Proponent should provide firwood for his	No disturbance to unmarked areas. No complaints of livestock theft, snaring or killing related to the project personnel.	SHE Officer	Barricading tape (to indicate working areas) Complaint logbook	Throughout the exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		onsite camping workers from authorized firewood producer or seller. The proponent must explore the possibility of transplanting or relocating vegetation found on the targeted rock units. Even if a certain shrub or tree is found along exploration and mining sites, this does not mean that it should be removed. Therefore, care should be taken when exploring and mining without destroying the site vegetation. **Fauna** Workers should refrain from killing species (big or small and all types) that may be found on and around the site. Workers should refrain from disturbing, killing or stealing locals' animals and killing small soil and rock outcrops' species found on sites. Noise levels should be kept at minimum in order to reduce interfere with the normal survival of wildlife especially those that use sound to navigate, to find food, mate or avoid predators. Environmental awareness on the importance of biodiversity preservation should be provided to the workers.				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
Illegal hunting	Illegal hunting of wildlife	For future provision, should the wildlife re-appear in the area during good rainy seasons, no hunting by exploration and mining personnel on-site is allowed. Site personnel should refrain from killing/poaching or snaring or intentionally disturbing local animals that may be found on and around the exploration and mining sites. Personnel are not allowed to kill or in any way disturb local livestock.	Incident reports of illegal hunting of wildlife by the crew.	SHE Officer	Complaints logbook	During site set up, and throughout exploration and mining phases
Aesthetics of the area	Visual impact	Implementation of continuous rehabilitation programme, by using overburden waste rock dumps should be considered. Utilize waste rubble to rock blind exposed rock faces and stockpiled topsoil to partially back fill to promote progressive rehabilitation of explored and mined-out sites. Carrying out of progressive working and restoration/rehabilitation over the shortest timescale possible, to avoid excessive areas of disturbance. Consider the phased exploration and mining and direct placement of overburden (topsoil and waste rocks) and other site-derived materials to allow progressive restoration around the margins of the explored and mined out site areas.	No further major contribution to the visual impact in the area. No complaints from the locals regarding major eyesore due to unmanaged site restoration	Exploration/Mining Manager	Complaints logbook Record of progressive backfilling done to reduce landscape contrast	Throughout the exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		Implementation of other suitable best international practice visual mitigation measures				
Health and safety	General health and safety associated with project activities in both phases	The Labour Act's Health and Safety Regulations should be complied with. As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs. When working on site, employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible. Drilled boreholes that will no longer be in use or to be used later after being drilled should be properly marked for visibility and capped/closed off. Ensure that after completion of exploration holes, drill cuttings are put back into the hole and the holes filled and levelled.	Comprehensive health and safety plan for all exploration and mining activities compiled.	Exploration/Mining Manager	Time, printing resources.	Prior to site setup activities and throughout the phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		An emergency preparedness plan should be compiled, and all personnel appropriately trained. Workers should not be allowed to drink alcohol prior to and during working hours as this may lead to mishandling of equipment which results into injuries and other health and safety risks. Workers should not be allowed on site if under the influence of alcohol. The site to be equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site. Temporary enclosed boundaries should be erected around high-risk area sites for the duration of project activities at that specific site area. This is done to control access to the site, in such a way that the public, especially children do not access the site and play with equipment and machinery on days when no work is done. A security guard or guards should be part of the team so that they can look after the project equipment and vehicles that would be left on site in weekends or public holidays (when no work is done) to ensure that no unauthorized person enters the area. To discourage the unsuspecting and uniformed local community from eyeing the empty hazardous containers, the site workers should if possible, drill holes in these				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		containers while kept on site (before transporting the containers to the waste site). All employees and contractors (personnel) to be trained on environmental awareness, the Proponent's internal Environmental Health and Safety Policy, Environmental Management Plan, and engagement with key stakeholders, specifically the key government ministries and farmers				
Health and safety	Accidental fire outbreak	Portable fire extinguishers should be provided on site. No open fires to be created by exploration and mining personnel. Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage.	No wildfires recorded (due to presence of workers)	SHE Officer	Fire extinguishers (1 per vehicle) and 1 per working site	Throughout exploration and mining phase
Archaeology and heritage	Accidental disturbance and destruction of archaeological or heritage objects and sites	Caution should be exercised when carrying out excavations associated with the exploration activities if archaeological/heritage remains are discovered Objects identified on the site to be of archaeological significance should not be disturbed but are to be reported to the project Environmental/Safety officer or National Heritage Council offices for further instructions and actions.	Preservation of all artefacts that are discovered around project area	SHE Officer Operator Foreman Superintended Archaeologist	Salvage equipment Flag tapes GPS (site marking)	As and when required, prior to site setup activities and upon encounter

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		Workers should be educated to not destroy or throw away but report (to the environmental/Safety officer) of any unknown object found/discovered on site. The worksite manager should familiarise themselves with the National Heritage Council's Chance Find Procedure (please refer to **Appendix 1 of this document**) and if uncertain about the procedure should receive training by a suitably qualified archaeologist with respect to the identification of archaeological/heritage remains and the procedures to follow in the event that such remains are discovered throughout the project activities' duration. **Once finalized and become available, the layout of access tracks (roads), waste rock dumps, field camps and other related infrastructure should be submitted to the NHC to verify the possible presence of archaeological objects or sites near these infrastructures**.				
Littering and waste management (general waste and sanitation)	Environmental Pollution	Project workers should be sensitized to dispose of waste in a responsible manner and not to litter. After each daily works, there should not be waste left scattered on site, but rather be disposed of in allocated site waste containers.	No visible litter around the project area	SHE Officer	Waste storage containers	Throughout exploration and mining phases.

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		No waste may be buried or burned on site or anywhere else throughout the project lifecycle. All domestic and general waste produced daily should be contained until such that time it will be transported to designated waste sites on a weekly basis. The sites should be equipped with separate waste bins for hazardous and general waste/domestic. Hazardous waste, including emptied chemical containers should be safely stored on site where they cannot be accessed and used by uniformed locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e. unapproved waste sites. As an emphasis on the preceding point, empty hazardous substance containers should not be disposed of anywhere on the project site or its surrounding, but instead they should be kept at a designated storing place on site until such time that they can be safely taken to the nearest approved hazardous waste sites. A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
	Wastewater generated by exploration and mining workers living on-site.	Provision of toilet facilities for exploration and mining workers (type of pit latrine or chemical toilet). Emptying of chemical toilets according to the manufacturer's specifications. Treating latrine waste to render non-polluting.	Adequate toilet facilities on site.	SHE Officer	Chemical toilets or excavator (pit creation), waste treatment agents/chemicals	At site setup and throughout exploration and mining phases
Vehicular Traffic	Traffic safety	The transportation of exploration and mining materials, equipment and machinery should be limited to once or twice a week only, and not every day. The heavy truck loads should comply with the maximum allowed limit while transporting materials and equipment/machinery on the public and access roads. The carted water into the area from Walvis Bay or other source of water supply should be done once or twice a week in container that can supply and store water for most of the week, thus reducing the number of trucks on the road on a daily basis. The site access road(s) should be upgraded to an unacceptable standard to be able to accommodate project related vehicles and access permits obtained from the Roads Authority. The site access road(s) should be provided for in such ways that they do not interfere	No complaints from members of the public regarding vehicular traffic issues related to the project All personnel operating the project vehicles and machinery are appropriately licensed and possession of valid driving licenses. Demarcated areas for parking, offloading, and loading zones are on sites Ste access road permits obtained, and requirements fulfilled	SHE Officer	None	Throughout exploration and mining phases. Site access permit (s) to be applied for and obtained prior to commencement of exploration works

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		with other traffic movement and/or compromise traffic safety on the host farms. Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses. Vehicle drivers should adhere to the road safety rules. Drivers should drive slowly (40km/hour or less), and on the lookout for livestock and wildlife. Ensure that the site access roads are well upgraded and in good condition to cater for vehicles travelling to and from site throughout the project's life cycle Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents due to mechanical faults of vehicles. Vehicle drivers should only make use of designated site access roads provided. Vehicles drivers should not be allowed to operate vehicles while under the influence of alcohol. Sufficient parking area for all project vehicles should be provided for and clearly demarcated son sites. The Proponent should make provision for safe materials and equipment offloading and loading areas on sites.				

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		No heavy trucks or project related vehicles should be parked outside the project site boundary or demarcated areas for such purpose. Truck movements, frequency, times, and routes should be carefully planned and scheduled – please refer to the next point. To control traffic movement on site, deliveries from and to site should be carefully scheduled. This should optimally be during weekdays and between the hours of 8am and 5pm. Site access roads should be provided for in such ways that they do not interfere with other traffic movement and/or compromise traffic safety on the host farms				
Air Quality	Dust generation	Drill and excavating/blasting equipment should be regularly maintained to ensure drilling and excavation efficiency and so reduce dust generation. Dust masks, eye protective glasses and other respiratory personal protective equipment PPE) accessories should be provided to the workers on site, specifically the ones exposed to dusty site area and activities. The impact mitigation measures should be covered in the relevant farm access agreement as required by law on commercial farms. This should also be considered for resettled farms.	No complaints from the public about vehicle emissions and dust generation. Visible efforts to curb dust	SHE Officer	Complaints logbook Vehicle and machinery mechanic	Throughout exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		The Proponent should ensure that the project activities schedules are limited to the given number of days of the week, but not every day. This will keep the vehicle-related dust level minimal in the area. Since the project site is in an area where due to little vegetation cover, soils are exposed, it is highly probable that more dust will be generated from excavation and drilling works and heavy vehicle movements on bare dry soils. It is therefore advised that in extremely windy days, a reasonable amount of water should be used to supress the dust that may be emanating from certain exploration and mining areas at the sites. In other words, Dry dust suppression methods such as reasonable amount of water should be employed to minimise dust generation. The transportation of exploration and mining materials, equipment and machinery should be limited to certain days of the week only as so to reduce dust generated by heavy vehicles in the area.				
Noise	Nuisance	The transportation of exploration and mining materials, equipment and machinery should be limited to once or twice a week only, but not every day. Noise from project vehicles and equipment on site should be reduced to acceptable levels.	Complaints from residents about excessive noise.	SHE Officer	Complaints logbook	At site set up and throughout exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		The exploration and mining times should be set such that, no such activities are carried out during the night or very early in the mornings (to be limited between 8am and 5pm on weekdays). Project (exploration and mining) hours should be restricted to between 8am and 5pm to avoid noise generated by project equipment and the movement of vehicles before or after hours. When operating the blasting and drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure. Target exploration and mining sites that may be found to be within less than 1 km from the residence (farmhouses) should be avoided at all cost. This is done to preserve some tranquillity for the residents. If the Proponent does not already have a blasting expert or the experience, an experienced blasting contractor should be hired to carry out exploration activities and mining phases in a professional manner such that noise is kept at minimum as a result of a very good ''know-how'' with the utilized blasting machinery and equipment				
Social nuisance	Job seeking and crashes due to	Priority of employment should be given to local people, and only if necessary and due	Correct and fair recruitment procedures	Exploration/Mining Manager	Records of employees and their places of	Pre-exploration and mining phases.

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
	differing norms, culture, and values	to lack of skills in the area, out-of-area people can be given some of the work. The locals to be employed during the project phases should be provided with the necessary training of skills required for the project to avoid bringing in many out-of-area employees. The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. Out-of-area workers that may be employed (due to their unique work skills) on site should be sensitized on the importance of respecting the local values and norms, so that they can co-live in harmony with the local communities during the duration of their employment on site	are followed and practised. More local people are employed for both skilled, semi and unskilled works Out-of-area people only employed for specialized skills that are not found in the project area. No complaints of unfair recruitment procedures. Grievance and response records	PRO	origins in relation to the site area	In special cases, during the project phases, depending on the project needs
	Potential increase of prevalence of HIV and AIDS, as well as other sexually transmitted diseases (STIs) prevalence	The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. Provision of condoms and sex education through distribution of pamphlets. These pamphlets can be obtained from local health facilities.	No new infections recorded linked to exploration and mining workers	SHE Officer	None	During site setup and throughout exploration and mining phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
	Private and Public Property intrusion and Disturbance or Damage	Project workers should be educated on the importance of respecting the locals' properties by not intruding or damage their homes, fences or snaring and killing their livestock. Any workers or site employees that will be found guilty of intruding peoples 'privately owned properties should be called in for disciplinary hearing and/or dealt with as per their employer' (Proponent)'s code of employment conduct Project workers should be advised to respect the community and local's private properties, values, and norms. No worker should be allowed to wander in people's private yards or fences without permission. Site workers are not allowed to kill or in any way disturb local livestock. No worker should be allowed to, without permission cut down or damage trees belonging either the farm owner, the neighbouring farms or in the already scarce community vegetation.	Harmonious interaction between the project personnel and property owners. No complaints of property damaged, or intrusion caused by project personnel	Exploration/Mining Manager PRO	Complaints logbook or records of grievances and how they were addressed	Throughout the exploration and mining phases.
PROGRESSIVE REHABILITATION AND DECOMMISSIONING PHASE						
Rehabilitation	Disturbance and damaging of land site land	All drilled boreholes and excavated pits related to the project activities should be capped and backfilled, respectively.	Capped boreholes and backfilled pits	Proponent	Record of boreholes drilled, and pits excavated (if any)	Throughout exploration and mining

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		All waste generated and store on site during exploration and subsequent mining activities should be disposed of at the respective nearest solid waste management sites. The stockpiled topsoil should be levelled during exploration activities and subsequent mining. Any temporary work camps setup should be dismantled, and the area rehabilitated as far as practicable, to their original state. Explored and mined-out areas on worksites should be progressively rehabilitated by stockpiling and backfilling. Provision of both financial and technical resources for progressive rehabilitation and post-exploration/mining activities should be made.	No sign of waste or littering seen on site and around site areas No stockpiled topsoil (topsoil is levelled after completion of each work) Campsite dismantled and materials taken away from site Visible signs of stockpiled topsoil Annual update of finances reserved for decommissioning		Waste containers on sites Photo records of backfilled sites Records of campsite Records of finances set aside for decommissioning activities	

4.3 Monitoring of EMP Implementation

To support and ensure that the proposed mitigation measures are achieving the desired results throughout the project phases, a monitoring plan must be implemented alongside the mitigation plan. **Table 4** presents the required environmental monitoring in terms of each potential impact, parameters to be monitored and monitoring objective. Included in the same Table is the reporting structures for monitoring, frequency, methods to be used, reporting structure, any thresholds that apply and relevant recommended actions.

The Table presents the monitoring implementation for both the exploration and mining phases, given the similarity in activities, hence the ''reporting structure'' column presented as ''Exploration/Mining manager. Therefore, the monitoring exercise will be done according to the relevant project stage or phase. In other words, for monitoring of mitigation implementation in the exploration phase, the reporting structure ends with the Exploration Manager and with the Mining Manager in the mining phase.

Table 4-3: Monitoring requirements for impact mitigation measures (adopted from and edited after Resilient Environmental Solutions, 2019)

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Water and soil pollution									
Compromised water quality due to fuel and lubricant spills or wastewater	Complaints from farmers and/or Traditional Authority within the project sites	To prevent contamination of surface water and groundwater.	No complaints from farmers and/or Traditional Authority about visible oil spills	Inspection of complaints logbooks	Weekly	SHE officer	SHE Officer> Exploration/ Mining Manager	A logged complaint	Further consultations with the farm/land owners and tests
Wastewater generated by exploration and mining workers living on-site.	Open defecation and urination.	To prevent environmental pollution	Adequate toilet facilities on site. Complaints from the public about open defecation and urination.	Visual observation. Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	A logged complaint	Clean-up of affected areas.
Soils									
Loss of topsoil	Increased loss of soil	To prevent loss of topsoil	No proliferation of informal vehicle tracks. No new erosion gullies	Visual observation	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	Proliferation of new vehicle tracks Formation of new gullies in work areas	Rehabilitation of affected explored and mined-out areas
Air quality									
Increase in dust	Complaints from public	To reduce public	No complaints from the public	Inspection of	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	A logged complaint	Dust suppression

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
generation, which might negatively affect occupational and residential respiratory health.	about increased in dust generation.	complaints and prevent negative changes in air quality due to exploration and mining activities	about increased dust generation.	complaints logbook.					around working areas to reduce fugitive dust
Hydrocarbon emissions from vehicles	Complaints from the public about increased vehicles fumes	Same as above.	No complaints from the public about increased vehicle emissions	Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	A logged complaint	Servicing of vehicles and machinery by a certified service provider
Poaching (Illegal hunting)									
Illegal hunting of wildlife	Reported poaching incidents by projects team	To prevent illegal hunting of wildlife	Incidents reports of illegal hunting of wildlife by exploration and mining workers.	Consultation with the local Police Service for reported incidents of poaching.	Weekly	SHE Officer	SHE Officer> Exploration Exploration/Mining Manager> local police service	An incidents report logged with the local Police Service	Appropriate action will be decided by the local Police Service
Habitat loss (Biodiversity)									
Localised loss of habitat and vegetation	Loss of habitat	To prevent loss of habitat outside	No disturbance to unmarked areas within the project area	Visual observation	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	Vegetation clearance outside of marked areas.	Rehabilitation of affected areas to the satisfaction of the SHE Officer

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
		areas of interest							
Health and safety									
No health and safety plan for exploration and mining activities.	Compiled health and safety plan for exploration activities.	To prevent health and safety impacts	No significant health and safety incidents (i.e. serious injuries or loss of life)	Visual observation Inspection of complaints logbooks	Daily/ weekly	SHE Officer and Exploration Manager	SHE Officer> Exploration/Mining Manager	Health and safety incident	Remedy the consequences
Potential increase in outbreak of wildfires due to project activities	Occurrence of wildfires	To prevent environment damage caused by wildfires	No wildfires recorded (due to presence of exploration workers)	Visual observation	Daily	SHE Officer	SHE Officer> Exploration/Mining Manager > local police service	Outbreak of wildfires due to the exploration workers	Rehabilitation of affected areas
Archaeology and cultural heritage									
Potential disturbance of archaeological and cultural heritage resources	Presence or unearthing of archaeological or cultural heritage resources	To prevent destruction of artefacts and sites	Preservation of all artefacts and sites that are discovered within the site boundary or around the project site area	Inspection of records of findings	Daily	SHE Officer Operator	Operator>Foreman> Superintended>SHE Officer>Project Archaeologist>National Heritage Council (NHC)	Unearthing of archaeological or cultural heritage resources	Cease all activities on site and wait for NHC to inspect site and give further instructions / actions
Employment creation									
Creation of employment	Creation of employment opportunities	To ensure that locals benefit	Number of locals employed during	Inspection of	Monthly	Exploration Manager	Project Manager or Proponent	Number of those employed	None

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
		from the project	exploration and mining activities	employment records					
Noise									
Potential increase in noise	Above ambient noise levels.	To ensure that generated noise does not disturb residents.	Complaints from residents about noise generated.	Inspection of complaints logbook	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	A logged complaint about above normal noise levels	Revision of site activities
Vehicular Traffic									
Increase in traffic density on declared Roads Authority (RA) roads or damage to these.	Complaints from the public about increase in traffic on RA roads. Complaints about damage to RA roads caused by movement of project vehicles and machinery.	To ensure continued ease of access to RA roads by residents	No complaints from the public about increase off traffic due to exploration and mining activities	Inspection of logbooks	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager > Roads Authority	A logged complaint about traffic increase or damage to RA roads	Find alternative access roads for the team. Rehabilitation of affected roads
HIV and AIDS									
Potential increase in	New HIV or STIs infections	To prevent new	No new HIV or STIs infections recorded	Liaison with local health facilities	Monthly	SHE Officer	SHE Officer> Exploration/Mining Manager	Recorded new HIV or STIs linked to	Continued sex education and

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
HIV and AIDS prevalence.		infections in the area					> Ministry of Health and Social Services	the exploration and mining workers	provision of condoms
Social nuisance: Property invasion or disturbance and damage									
Potential intrusion or damage/destruction of private or public properties	Unauthorized intrusion and or damage to properties	To prevent crashes and tensions between the Proponent and the land/property owners	No complaints of property damage or intruding by project personnel	Liaison with property owners or occupiers of land	Monthly	PRO	Exploration/Mining Manager (or Proponent)>PRO>Landowners/Occupiers of land	Arising new complaints	PRO to warn the personnel on respecting people's properties. If persists then Code of Conduct to be implemented
Environmental Pollution (Littering)									
Environmental pollution from solid waste during exploration and mining activities.	Scattered litter	To prevent littering of the general project area	No visible litter around the project area	Visual observation	Daily	SHE Officer	SHE Officer> Exploration/Mining Manager	Visible littering around project site	Clean-up of the affected areas and ensuring exploration and mining workers utilise waste containers provided.
Visual									
Visual impact owing to the	Contrasting landscape	To prevent and or	Reduction of and insignificant	Visual observation	Weekly	SHE Officer	SHE Officer> Exploration/Mining Manager	Major and very visible	Effective implementatio

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
project's exploration and mining activities	(eyesore to travellers on the B2 road) and locals	reduce the appearance of contrasting land scars	(minor) contrasting landscape in the project site areas					contrasting land scars on the site areas	n of provided measures and continual improvements using other suitable visual mitigation measures. Ensuring that exploration and mining works are carried out on the targeted sites/spots of the mining claims only.
Site Rehabilitation									
Soil and land disturbance because of exploration and mining activities.	Abandoned and stockpiled topsoil as well as very disturbed land surface	To prevent major soil and land damage by project activities	No major soil and land disturbance	Visual observation	Daily	SHE Officer	SHE Officer> Exploration/Mining Manager	Visible soil and land disturbance	Effective progressive backfilling of topsoil and rocks

5 RECOMMENDATIONS AND CONCLUSIONS

It is recommended that an Environmental Clearance Certificate be issued for the proposed exploration and mining activities on Mining Claims 68945, subject to the following recommendations:

- All required permits, licenses and approvals for the proposed activities should be obtained as required (please refer to **Table 2** for Permitting and Licensing requirements). These permits and licenses include borehole drilling on farms, water abstraction & use permits, land/farm access agreements to explore and mine, etc.
- The management action plans in the EMP should be implemented and monitoring conducted as provided in **Table 3** and **Table 4**, respectively as well as the implementation of Archaeological Resources management measures indicated in **Appendix 1**.
- The Proponent complies with the legal requirements governing this type of project and its associated activities.
- All the necessary environmental and social (occupational health and safety) precautions provided should be adhered to.
- Areas where exploration and mining activities have ceased should be rehabilitated, as far as practicable to a closer appearance like the pre-project state.

In conclusion, the effective implementation of the recommended management actions (mitigation measures) will see the significance reduction in impacts' significance (that cannot be avoided) from medium to low. It is therefore recommended that the Proponent and their contractors/employees effectively implement the recommended management plan actions (mitigation measures). Furthermore, to maintain low significance, the implementation of measures will need to be continuously monitored by the Proponent (or the SHE Officer). Monitoring will not only be carried out to maintain the low rating of impacts' significance but to also ensure that all potential impacts identified in this study and other impacts that might arise during project implementation are properly identified in time and addressed.

Based on the afore-mentioned points, it can be concluded that that the proposed activities may be granted an Environmental Clearance Certificate. The ECC issuance will be on condition that the recommendations and impact mitigation measures in this report and all the provisions in the EMP are adhered to.

APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Responsibility:

Operator:	To exercise due caution if archaeological remains are found
Foreman:	To secure site and advise management timeously
Superintendent	To determine safe working boundary and request inspection
Archaeologist	To inspect, identify, advise management, and recover remains

Procedure:

<u>Action by person identifying archaeological or heritage material</u>

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

<u>Action by foreman</u>

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.