



Environmental Impact Assessment and Management Plan for the Exploration
and Mining Activities at the NAMAGRA Mine - ML 142

Prepared for

Namibia Marble and Granite

For the

Exploration and Mining Activities at the NAMAGRA Mine

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Project Location: Erongo Region, 20km south of Karibib

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1. List of Acronyms

Environmental Impact Assessment	EIA
Environmental Management Act	EMA
Environmental Management Plan	EMP
Interested and Affected Parties	I&AP
Ministry of Environment and Tourism	MET
Ministry of Labour and Social Welfare	MLSW
Terms of Reference	ToR

2. Executive Summary

2.1 Project Background

The Proponent, Namibia Marble and Granite has been operating a marble mining and exploration operation since the early 1990's. The mining area is on a private farm, Habis located about 20km south of Karibib .The Proponent indicated that they need to comply with the new National requirements of the Environmental Management Act of 2007 and the 2012 Regulations.

The Identified impacts related to the socio-economic effects and environmental impacts with mitigation measures are discussed of this report.

2.2 Purpose of this Report

In terms of the Environmental Management Act (7 of 2007) and the 2012 Environmental Impact Assessment (EIA) Regulations, this proposal triggers the Environmental Impact Assessment process.

The Proponent, appointed EnviroSolutions to complete the EIA for this project. The completion of an EIA before this development is consistent with the Namibian environmental regulatory requirements. The objectives of the EIA are therefore as follows:

- To obtain approval from the Ministry of Environment and Tourism for the operational activities at the mine.
- To assist the relevant authorities with a final decision on the requirements and conditions that would be applicable to the Proponent.
- To identify all potential risks and impacts associated with the mining and exploration activities.
- To identify potential socio-economic impacts associated with this operation, both positive and negative.
- To suggest the most suitable mitigatory measures so as to reduce the nature and extent of any negative impact on the environment.
- To investigate the current and pending legal framework to which this project will need to comply, and finally,
- To identify and consult with Interested and Affected Parties so as to incorporate their concerns and suggestions into the planning phase of this project.

2.3 *Terms of Reference*

The Terms of Reference (ToR) provided by the client is described in this section. This is also aligned with the requirements of the Environmental Management Act 7 of 2007 and the 2012 Regulations. The following was therefore required as part of the scope of work:

Environmental Impact Assessment: It is expected that the assessment and the management plan should be able to explain how to deal with the identified impacts to eliminate or minimize it during the operational phases.

Impacts that might be considered include the following:

- **Air Quality**
- **Surface Water / Water Quality**
- **Fauna and Flora**
- **Land use plans**

Impacts should also be classified for Normal, Abnormal and Emergency situations using the criteria below:

The type

- ***Permanent or***
- ***Temporary***

The magnitude

- ***Low***
- ***Medium***
- ***High***

2.4 *Alternatives (Including the No-Go Option)*

The specific site has been identified by the Proponent and mining operations has been conducted on this site since the early 1990's. This is an existing operation and the objective is to ensure the operation complies with the national legal requirements.

2.5 *Assumptions and Limitations*

- All information received from sources contributing to this project is correct.
- That the applicant will implement the recommendations derived from this study.

2.6 *Summary of Key Findings*

Key findings of the Environmental Impact Assessment Study indicate that the project can be implemented, provided the recommended control measures are implemented.

- The Proponent has been in operation since 1992 and has made significant investments in terms of mining equipment used at the mine as well as the local economy of Karibib.
- The mine has developed a Health, Safety and Environmental Policy which will be reviewed regularly to ensure compliance with legal requirements.
- The mine site that is used for mining is not regarded as a sensitive biodiversity area and it is located on private farm land. The Proponent and the Land owner has an agreement in place for the long term use of the land.
- There are some negative impacts associated with mining. These impacts do not necessarily have a negative impact on the biodiversity of the surrounding environment, since the operation is very localised and the affected area consist of one outcrop / mountain range.
- The mine is significant for the local economy and boosts the town of Karibib and the local communities. It also create employment opportunities. Secondary business opportunities has been established as a result of this operation.
- The socio economic impacts associated with the scale of this project will not negatively affect the socio-economics of the area.

3. Introduction

3.1 The background and Context of this report

The Proponent, Namibia Marble and Granite has been operating a marble mining and exploration operation since the early 1990's. The mining area is on a private farm, Habis located about 20km south of Karibib .The Proponent indicated that they need to comply with the new National requirements of the Environmental Management Act of 2007 and the 2012 Regulations

For a development of this nature an EIA is required. The EIA needs to be reviewed and approved by the relevant authorities to ensure the Proponent is compliant with the applicable legislation.

- Since this is an existing operation, the completion of an EIA is important to ensure potential environmental and social impacts associated with an operation of this nature is identified and effectively managed. This is essential to ensure that mitigatory measures, if required, are included as part of the daily operations.

EnviroSolutions was appointed to facilitate the completion of the Environmental Impact Assessment and the Environmental Management Plan. The objective is to develop a management plan for the current impacts associated with the operation. The recommended mitigation measures should be implemented to ensure that impacts to the environment are managed effectively.

This report comprises an assessment of the impacts, and aspects related to the current operation. These were identified through site visits, investigations, and review of existing information available for the area.

3.2 Approach Methodology

The intention of the study is to ensure the current activities by the Proponent are aligned with the Namibian legal requirements. Furthermore, proper mitigation measures should be implemented to ensure that the operation is compliant. The following approach was used:

1. Site visit and review of current activities at the mine.

2. Assessment of potential effects associated with the current operations of the mine.
3. Consultation with the land owners.
4. Completion of an assessment, to predict the conditions likely to result from activities associated with the current operations.
5. Development of a management plan to mitigate potential negative impacts.

EnviroSolutions takes cognizance of the fact that the Environmental Assessment report will be independently reviewed by the Ministry of Environment and Tourism (MET). In this way, practical and realistic solutions to potential problems can be identified in a consultative manner. The intention of this report is to ensure the project achieves regulatory compliance, appropriate environmental evaluation is in place and proper mitigation measures are implemented.

4. Project Description

4.1 Project Location

The marble and granite mining operation is located about 20km south of Karibib at the NAMAGRA Mine site. The project location is best appreciated in the figures below:



Figure 1: NAMAGRA Mine Site (20km south of Karibib)

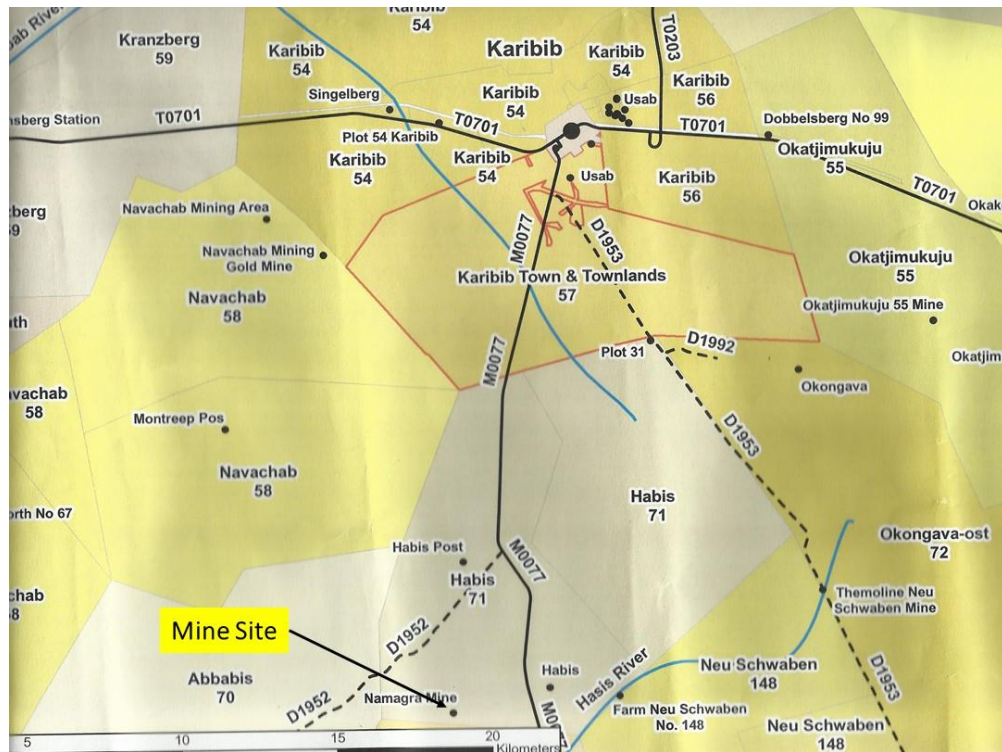


Figure 2: NAMAGRA Mine (on Farm Habis)



Figure 3: NAMAGRA Mine Site

4.2 The Current Operational Activities

Access roads and routes to the site:

Access to the mine is via gravel roads, the C32, (18km) and the D1954 (1km) and a 4km private road to the mine.

Sampling and Testing:

The Proponent has identified suitable material on the current mine site and it is anticipated that the operation will continue. The first step to finding the perfect material is to locate an optimal deposit of material with desirable colour, pattern, and composition.

Samples are taken by boring into the outcrop to take core samples with diamond-tipped drill bits. These samples are then examined and tested to determine if the stone is suitable.

Alternatively samples are taken, using a butterfly drill with diamond cutting wires that creates a triangular sample.



Figure 4: Typical testing method

Overburden Removal:

Once the best material has been identified, an access route is cleared to take equipment to the preferred location. Each situation presents a unique challenge for the extraction of blocks and it may take extended periods of time to remove overburden before the stone is accessible. It will require innovative construction techniques such as building roads on areas with steep inclines before the material is accessible.



Figure 5: Typical new access road to an outcrop

Extraction of Blocks:

Once the marble is accessible and a decision has been made on how to extract the blocks, the drilling will commence. The process starts by taking down a “bench wall,” a large dimensional chunk of rock that is then cut into smaller blocks which will eventually be sent to a factory for processing. The bench walls will be cut with diamond wire cables. Sandy material will be used against the base of the wall to cushion the fall of the blocks once it has been released.



Figure 6: Marble Block removal

Transportation of Blocks:

Once the blocks have been extracted, it will be loaded on flatbed trucks. The blocks are then secured and tied down on the truck and transported to Karibib railway station. The blocks are loaded onto rail trucks and transported to it final destination.

Crushing:

An alternative product from the mine is waste marble or granite blocks. These blocks are crushed into different size, < 11mm and 11 – 42mm, and sold as crushed stone. This also ensures that waste materials are effectively utilised.



Figure 7: Marble Crusher

(Production figures for the mining operation is available in Appendix A)

4.3 Other Infrastructure and Services

4.3.1 Water Supply

Freshwater is primarily used for human consumption. All freshwater is transported to the mine, once a week. The current consumption is 5m³ / week. The water is stored in freshwater tanks onsite.

Water for mining activities is obtained from the old mined out area / pit. Rain water collects in the pit and is then pumped via pipelines to where it is required on the mine.



Figure 8: Rainwater pit

4.3.2 Waste water and Effluent Treatment

For the purposes of sanitation, the Proponent has established ablution facilities that are connected to a Septic tank / French drain sewage treatment system.

Hazardous effluent, e.g. oil, grease etc., is collected in drums and transported to Walvis Bay or Swakopmund where it is sold to recyclers.

4.3.3 Energy Supply

The Proponent is connected to the Erongo RED grid with a 250kV power line. There is also a 133kW solar plant onsite to supplement electricity requirements and an initiative to make use of renewable energy sources.



Figure 9: View of a section of the Solar Plant

4.3.4 Solid Waste Management

Waste design technologies are taken into consideration in avoiding waste generation. A method of waste segregation has been adopted to separate solid waste into recyclable groups such as glass, plastic and paper. These recyclable items together with any hazardous waste such as automotive oil will be transported to Karibib to be recycled or disposed at the municipal landfill site.

Waste rock is crushed and sold as crushed stone in order to minimise mine waste dumps.

4.3.5 Fuel Storage Facility

The Proponent stores 25,000l of diesel onsite. The fuel is primarily used for the mine's mobile heavy equipment. The fuel storage facility is currently not bunded but plans are in place to ensure the fuel storage facility complies with the legal requirements.

5 Regulatory framework and other requirements

5.1 Regulatory Agencies

The regulatory agencies guarding or implementing the relevant environmental regulations are listed as follows:

Table 1: **Government agencies regulating environmental protection in Namibia.**

REGULATING AGENCY	ROLE IN REGULATING ENVIRONMENTAL PROTECTION
Ministry of Environment and Tourism (MET)	MET is the lead government agency charged with Environmental Monitoring, Assessment and Management. The mission of MET is to maintain and rehabilitate essential ecological processes and life-supported life-support systems, to conserve biological diversity and to ensure that the utilization of natural resources is sustainable for the benefit of all Namibians, both present and future, as well as the international community, as provided for in the Constitution. MET lays a foundations to implementation and promulgation of regulations relevant to this activity including; the Environmental Act no7. Of 2007, Park and Wildlife Management Bill, the Pollution Control and Waste Management Act , The MET plays a role in the approval of Environmental Impact Assessments (EIAs) which are prepared under Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995). Provisions in other line ministries' legislation (strengthens MET's position.
Ministry of Mines and Energy (MME)	The MME issues prospecting and mining licences as well as exploration/ prospecting and production licences ensuring that mining activities in Namibia are environmentally sustainable.
Ministry of Agriculture, Water and Forestry (MAWF)	MAWF's is the leading agency undertaking the Agricultural, Water and Forestry sectors towards the promotion of an efficient and sustainable socio-economic development of Namibia. MAWF is the regulating body of the promulgation of the Water Resource Management Act, 2004 and the Forest Act 12 of 2001, relevant to this project. The Department of Water Affairs is the government agency responsible for water quality monitoring and reporting.
Ministry of Works, Transport and Communication	The Ministry of Works, Transport and Communication is dedicated to ensuring the availability and the quality and maintenance of transport infrastructure and specialised services. This government body is responsible for implementation of the Roads Authority Act 17 of 1999.
Ministry of Labour	MOL is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act no. 6 of 1992.

5.2 Environmental Management Requirements

An important component of an Environmental Assessment process is the review of applicable and relevant legislation pertaining to this activity. The legislative and regulatory foundation for protection and management of the environment and its natural resources is governed by the Namibian Constitution. Article 95(l) of the constitution clearly emphasizes the promotion of the welfare of the people, whereby *the maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future; in particular.*

The Environmental Management Act (EMA) No.7 of 2007 and the Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1995)

set the guiding policy/ legal framework for environmental management in Namibia. The intended activity is listed under the EMA regulation of 2012. Section 3 **MINING AND QUARRYING ACTIVITIES** states that an environmental assessment is required.

These instruments make it mandatory for any proposed development to be subjected to an Environmental Assessment procedure. Both promote sustainable development and economic growth while safeguarding the environment in the long run. The figure below illustrates the Environmental Assessment process in Namibia.

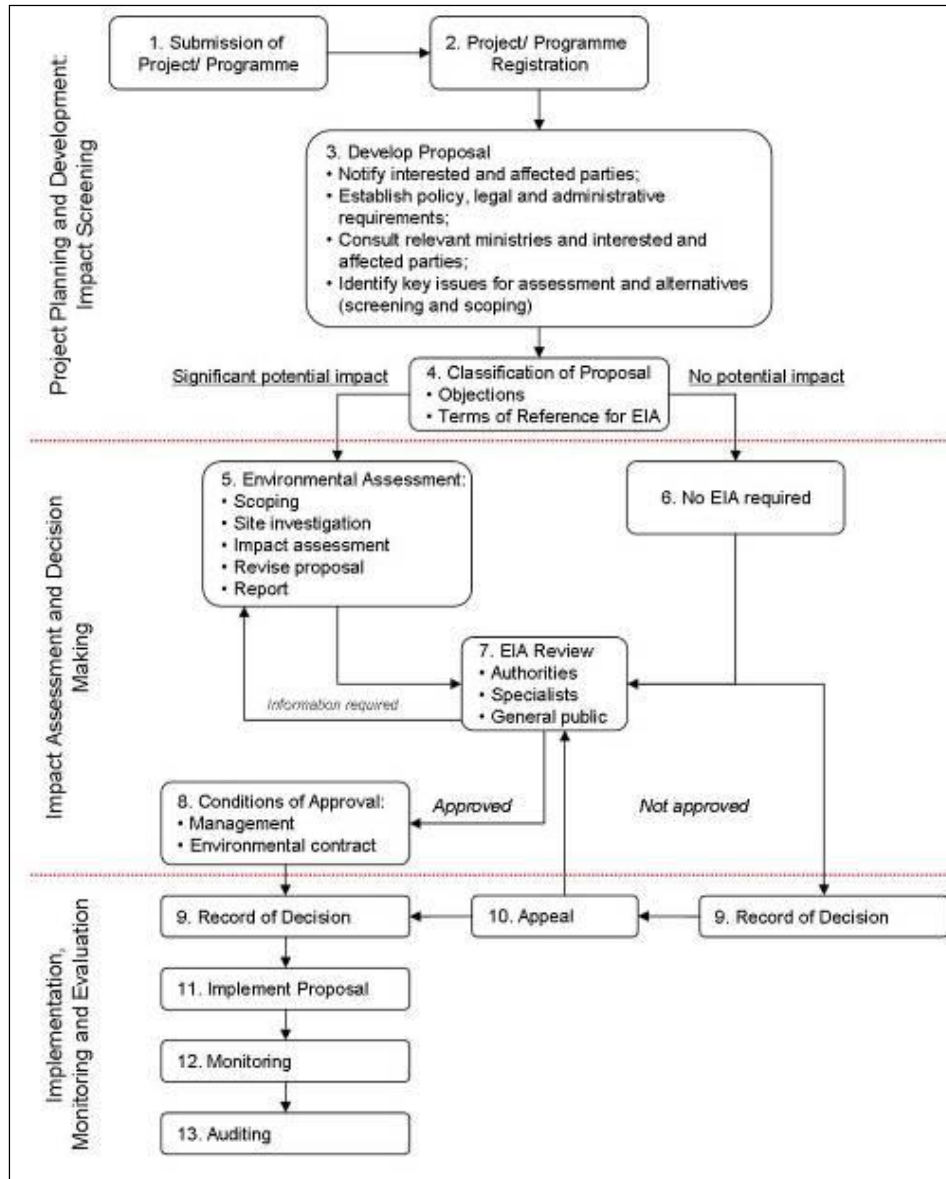


Figure 10: Illustration of the EIA Process in Namibia

Currently the project is at Stage 5: Environmental Assessment. Once the Environmental Assessment Process has been completed the final document will be reviewed by the authorities, specialists and the public.

5.3 *Legislation of international significance*

5.3.1 **Convention on Wetlands and Biological Diversity**

The Convention on Wetlands of International Importance, especially as Waterfowl Habitat, 1971 (Ramsar) aims primarily to prevent the loss of wetlands, to promote the wise use of these, and to give special protection to listed wetlands. The Convention stresses a habitat-type approach rather than a species-specific approach.

The primary goal of the Convention on Biological Diversity, 1992, is the conservation of biodiversity. The causes of threats to biodiversity should be anticipated and prevented, and the precautionary principle should be applied. Parties to the convention are obliged to:

- Establish a network of protected areas;
- Create buffer areas adjacent to these protected areas using environmentally sound and sustainable development practices; and
- Rehabilitate degraded habitats and populations of species.

Of relevance is the fact that there is surface water in the old mine pit. This water body is not a natural water body and it is used as a storage dam for the mine's water requirements. It is highly unlikely that Waterfowl would frequent this area because of the daily operational activities at the mine.

5.3.2 **Convention on Combat Desertification (CBD)**

The convention recognized that the conservation of biological diversity is “a common concern of humankind” and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. It links traditional conservation efforts to the economic goal of using biological resources sustainably. It sets principles for the fair and equitable sharing of the benefits arising from the use of genetic resources, notably those destined for commercial use.

The objectives of the CBD are:

- The conservation of biological diversity,
- The sustainable use of its components and
- The fair and equitable sharing of the benefits arising out of the utilization of genetic resources, including by appropriate access to genetic resources and by appropriate transfer of relevant technologies, taking into account all rights over those resources and to technologies, and by appropriate funding.

The Proponent should therefore prevent the unnecessary removal of any species prior and during their operations. Conservation of species and ecosystem to combat the increasing rate of loss of biological diversity is one of Namibia's challenges due to a heavy reliance on natural resources and ecosystem goods and services.

In the interest of welfare of the people, the state has adopted policies aimed at maintaining ecosystems, ecological processes and biodiversity for the benefit of present and future generations. The National Biodiversity Strategy and Action Plan (NBSAP) and the Namibia Community-based Tourism Association (NACOBTA) can assist the Proponent in environmental management issues. Direct impact on biodiversity is minimal but a precautionary approach is necessary to ensure those disturbances are avoided.

5.4 *Legislation of national significance*

National legislation exists to protect the environment and threats to public health. Included, among others, are issues related to the protection of public water supplies, nuisances and other public health issues. Nuisances are broadly defined as any condition which is considered to be offensive, injurious or dangerous to health. This definition is broad enough to cover a range of issues, and thus this law may be effective in any instance where public health might be compromised.

5.4.1 *Legislation related to Mineral Prospecting and Mining*

Mineral exploration and mining operations in Namibia are regulated under the Minerals (Prospecting and Mining) Act of 1992 through the granting of Exclusive Prospecting and Mining Licenses.

These licenses confers exclusive mineral prospecting or mining rights over land up to 1000km² in size for a period of three years initially, renewable twice for a maximum of two years at a time. The exclusive rights are in respect of defined minerals only. Most

License holders are registered companies, and the Ministry of Mines and Energy (MME) may only grant the licenses after the application has been recommended by the Mines Prospecting and Mining Committee.

A full Environmental Assessment is usually required for prospecting or mining in a Protected Area and/or National Monument. Should the Mines Prospecting and Mining Committee agree to recommend approval (after reviewing the EA), an Environmental Management Plan and an Environmental Contract *must* be concluded before the prospecting or mining can commence.

Off relevance is the fact that the envisaged activities will not take place in a protected area. Furthermore the Proponent indicated that it is their intention to have full legal compliance with the applicable environmental management requirements.

5.4.2 Legislation related to Public Health

Section 119 of this Act prohibits the existence of a nuisance on any land owned or occupied by the Proponent. The term nuisance is important for the purpose of this EIA, as it is specified, where relevant in Section 122 as follows:

- a) any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- b) any dung pit, sloptank, ash pit or manure heap so foul or in such a state or so constructed as to be offensive or to be injurious or dangerous to health;
- c) any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- d) any other condition whatever which is offensive, injurious or dangerous to health.

Furthermore in terms of Section 8 of the Public Health Proclamation 16 of 1936, where a local authority is of the opinion that a nuisance is seriously offensive or a serious menace to health, it may serve a notice on the owner or occupant of the nuisance to immediately remove the nuisance. Failure to abide by this provision is an offence. Of relevance is that the mine is located on private land and the owner has a consent agreement with the Proponent.

5.4.3 Legislation related to hazardous substances

Chapter 5 of the Health and Safety Regulations under the Labour Act covers hazardous substances including transport, handling and storage. The supplier and transporter of hazardous substances must ensure that the marking, labeling and storage of hazardous substances for safe transport, especially the labeling of the transport vehicle and the storage of the hazardous substances during transport, must be in accordance with existing legislation, or where such legislation is not in place, in accordance with the recommendations on the transport of hazardous substances or dangerous goods made by the United Nations (Section 177).

Hazardous substances must at any time be stored in such a manner that they do not create a risk to the health and safety of employees or other people, nor any risk of contamination of the environment, due to seeping, leaking, fire or accidental release (Section 182(1)). Areas designated for storage of hazardous substances must be isolated from other activities and be clearly marked with appropriate warning signs (Section 182(2)).

Hazardous waste and deposits must be removed at intervals and by methods appropriate to the type of hazard, which they constitute (Section 183(1)). Contaminants collected must be disposed of without risk to the health of any person or to the environment, and according to the applicable statutory provisions and regulations (Section 183(2)).

Of relevance to the envisaged activities, would be the disposal of mining waste, processing waste and waste generated due to maintenance activities. Karibib, the nearest town, does not have an approved landfill site that can accommodate hazardous waste. The Proponent will have to ensure all hazardous waste is collected and contained, prior to disposal at an approved site, e.g. Walvis Bay.

5.4.4 Legislation related to Construction and Demolition

The following is relevant in terms of the Health and Safety Regulations under the Labour Act:

Noise

No employer shall require or permit an employee to work in an environment in which he or she is exposed to an equivalent noise level equal to or exceed 85 db (A).

If the equivalent noise level to which employees are exposed in any work-place is equal to, or exceeds, 85 db (A), the employer shall reduce the levels to below 85 db (A) or, if

this is not practicable, he or she shall reduce the level to as low as is practicable and take all reasonable steps to the satisfaction of an inspector, isolate the source of the noise.

Fire precautions

(1) An employer shall for the purpose of a fire at the work place, provide and ensure the following-

Submit a plan and system of escape for approval by an inspector;

Provide adequate means of escape or escape routes from the factory building for the use by all employees;

A door of a room in which persons are employed, and a door of a passage or staircase serving as a means of exit from such room, shall, while employees are there in the room, be kept clear and unlocked so as to allow for quick and easy egress from the room; this applies to the outer door or entrance by which employees usually enter or leave the building, whether or not such door is used exclusively by the employees of the employer;

Staircases and steps leading from one floor to another or to the ground shall be fitted with substantial hand-rails;

Any staircase or passage which is so steep, narrow, winding or otherwise restricted as to be a dangerous means of exit, shall be altered to the satisfaction of an inspector so as to make the staircase or passage safe;

Staircases and passages which are intended to be used as fire-escapes, shall be properly marked and lighted to the satisfaction of an inspector and all staircases used or intended to be used as fire escapes shall be constructed of suitable non-flammable material and shall be kept clear of any obstruction.

(2) An inspector may require that any door, other than a sliding-door, but including an outer door, be fitted to open outwards from the room, passage, staircase or factory from which it is a means of exit.

(3) An inspector may, having regard to the structure and situation of the premises and the nature of the activities conducted in or on the premises, require the provision of suitable fire-extinguishing appliances which shall be maintained in good working order and positioned in accessible places as instructed by the inspector.

(4) An inspector may direct that audible fire alarms, which are operated by an independent power supply or by other suitable means, be fitted in the work-place and maintained in good order.

(5) In installations using toxic gases for the purpose of fire-fighting, including carbon dioxide installations, an automatic warning device shall be incorporated in the system.

(6) Means of escape and fire escape routes to be used in case of a fire shall be clearly be marked.

(7) If an inspector considers it necessary, employees shall be instructed in fire-fighting and the correct use of fire appliances.

Transport of hazardous substances

The supplier and transporter of hazardous substances shall ensure that the marking, labeling and storage of hazardous substances for safe transport, especially the labeling of the transport vehicles and the storage of the hazardous substances during transport, shall be in accordance with existing legislation, or if such legislation is not in place, in accordance with the recommendations on the transport of hazardous substances or dangerous goods made by the United Nations.

Safety data sheets

An employer shall furnish his or her employees who are handling or using hazardous substances, and the work-place safety representatives, with a safety data sheet for employees, and such safety data sheet shall include the information specified in regulation and be available in respect of a product used at work containing hazardous substances.

Handling and Transportation of hazardous waste

Hazardous waste and deposits shall be collected and removed at intervals and by methods appropriate to the type of hazard which they constitute. Contaminants collected shall be disposed of without risk to the health of any person or to the environment and according to applicable statutory provisions and regulations.

All storage tanks must be supported on suitable padding to prevent damage. The offloading thereof must be done according to SANS requirements. During offloading, this must be done crane or suitable way and not rolled off the vehicle.

Vessels under Pressure

The user, occupier or person owning or leasing a boiler, pressure vessel, air receiver or other vessel under pressure, shall cause or permit such boiler, receiver or vessel to be used or operated only –

- a) in accordance with a permission issued by an inspector;
- b) if inspected and maintained in accordance with these regulations in regard to boilers and pressure vessels; and
- c) In compliance with these regulations.

The chief inspector may, in accordance with regulation 18, approve an inspection authority to perform the inspection duties specified in this regulation.

5.4.5 Legislation related to Air Quality

Air pollution is controlled primarily by the Atmospheric Pollution Prevention Ordinance (11 of 1976). This Ordinance generally provides for the prevention of the pollution of the atmosphere.

Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Of applicability to the current operation, is dust generated by vehicles, trucks, mining equipment as well as dust generated during the liberation of the blocks. The risk of dust generation from the waste rock crusher plant is high.

5.4.6 Legislation related to Soil Conservation

The objectives of the Soil conservation Act 76, 1969 are to make provision for the combating and prevention of soil erosion, and for the conservation, protection and improvement of the soil, the vegetation and the sources and resources of the water supplies.

Part II, deals with soil conservation works and it further states that in section 4(1) The Minister may by means of a direction order the owner of land to construct the soil conservation works referred to in such direction either on land belonging to such owner or on land belonging to another person, in such manner and within such period as may be mentioned in such direction, if the Minister is of the opinion that the construction of such soil conservation works is necessary in order to achieve any object of this Act in respect of the land belonging to such owner.

Of relevance is the fact that the area is currently not used for any other purpose than mining activities. The Proponent should however ensure that when new areas are explored, all the topsoil should be stored separately to ensure the seedbeds are

conserved and can be used when rehabilitation of the area is conducted after mining has been completed.

5.4.7 Legislation related to water quality and resources

The Water Resources Management Act (Act 24 of 2004) governs the quality of both fresh- and seawater used for industrial purposes. Restrictions imposed on users are as follows:

Any water used for industrial purposes must be purified to standards prescribed by the Minister. Purified or treated effluent must be returned to the source from which it was originally drawn. This may, however, be changed subject to ministerial intervention.

Inspections may be carried out at any time by the Department for Water Affairs (or a nominee). The Secretary has the power to suspend or restrict operations which may be causing water pollution and to impose certain conditions on the offender. The Prevention and Combating of Pollution at Sea by Oil Act of 1981 is also concerned with water quality.

Of relevance to the Proponent would be that the majority of the water for exploration and mining activities would be obtained from the rainwater collected in the mine pit and would therefore have limited impacts on water resources in the area. A permit needs to be obtained from the Department of Water Affairs for the abstraction and use of ground water if it is required.

5.4.8 Legislation related to effluent and waste water disposal

The Proponent has established ablution facilities on site. Since the project area does not fall within a local authority jurisdiction the Proponent should ensure that effluent an industrial effluent discharge from the envisaged activities is in compliance with The Model Drainage Regulations, 1996.

Compulsory provision of a drainage installation or other sanitary disposal system

When connection to public sewer is not an option the Proponent shall before occupation make provision for a conservancy tank or a septic tank and absorption field on site. Sanitary systems must be constructed and located in such a way as to prevent a causation of any nuisance or unhygienic or offensive conditions. Subject to SANS requirements.

Sewage or other prohibited discharges not to enter storm water drains or roads

The occupier of any premises shall provide for facilities necessary to prevent any discharge, leakage or escape of such liquids onto any street or any premises or into any storm water drains or watercourse. No person shall cause or permit any storm water to enter any drainage installation on any premises.

Control of industrial effluents

No person shall discharge or cause or permit to be discharged into any public sewer any industrial effluent or any other liquid or substance, other than soil water or wastewater. Any occupier of a premise from which industrial effluent is discharge into a public sewer, shall: provide overflow detection devices, pre-treatment where necessary to comply with regulations and ensure that no prohibited discharges enter into public sewer systems. Application to discharge effluent into public sewer prohibited substances is listed under the regulations.

5.4.9 Legislation related to petroleum products

Regulations made under the Petroleum Products and Energy Act 13 of 1990 states that:

A license or certificate is required for purposes of storing or keeping fuel in a quantity of 200 litres or less in any container kept at a place within a local Authority area or fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area.

Containers used to store or convey petroleum products

Petroleum product containers must be completely leak-proof and spill-proof and otherwise safe and suitable for storage and conveyance. Such containers may not be used as water trough or for any purpose that may cause environmental harm, safety or health of any person or animal.

These regulations applies, in the case of an above-ground tank, to a storage tank with a capacity of 2,200litres or more and in the case of all below-ground tank, to a capacity with a capacity of 4,560 litres or more. Every license-holder or certificate holder shall with regard to any replacement or installation of a storage tank, or a remaining storage tank, which this regulation applies and which is in the possession of such license-holder or certificate holder, annually not later than 28 February, duly complete Form PP/10 as set out in Annexure B, and shall submit such form together with the information requested therein by the Ministry of Mines and Energy.

Building, roadwork, structures and plant

All buildings, roadwork, structures and plant erected must comply with these regulations and applicable laws in a manner that avoids endangering the safety or health of any person or the safety of any person's or property and prevent the risk of significant environmental harm. Ensure that the plant is left in a safe and environmentally sound condition after use or as a result of using the plant.

Fire precautions and Emergency measures

- Ensure that all buildings, roadwork, structures and plant used in connection with petroleum products are designed, constructed, equipped and maintained so as to prevent fires and explosions, and if any occurs, these must be able to minimize the harmful effects of fires and explosions
- Ensure that personnel or those involved in the handling of products exercise caution with due regards to potential of fires or explosives and that they comply with any other regulations regarding these.
- Buildings, structures and plants where petroleum products are held shall be adequately signposted.
- No person shall at any place where petroleum products are handled or stored, throw, leave or create any open or naked light, spark or flame or any burning or smouldering material if it may cause danger of fire/explosion.
- No person shall keep a vehicle running while fuel is being dispensed into a tank of that vehicle, smoke in the forecourt of a retailer outlet where fuel is dispensed or receive/call make calls from, or keep active, a cellular telephone or any other electronic communication apparatus within 15 meters from a vehicle while a petroleum product is being discharged from such vehicle into an underground storage tank.
- A license holder shall with regard to the storing, keeping, handling, conveying, using or disposing of petroleum products at all times take adequate precautions to prevent the outbreak of a fire.
- Provide and at all times keep available suitable and adequate fire-fighting appliances which shall be maintained in good working order, and tested at least once a year, and positioned in accessible places on the relevant premises where petroleum products are kept/stored/handled/conveyed or used.
- A written fire emergency plan must be in-place during a fire outbreak, this plan must be clearly displayed and accessible, including suitable and adequate fire-fighting plan showing all locations, type of equipment, plan of action and tasks for employees during a fire outbreak. Employees shall be adequately trained to deal with a fire emergency. Copies of the emergency plan and plan of action shall be submitted to the Ministry if requested.

Any permit holder under these regulations shall furnish the Permanent Secretary not later than 28 February each year with a statement in Annexure B, regarding quantity of used mineral oil purchased, sold, obtained or used. A license holder or certificate holder must inform the Ministry of Mines and Energy in the event of a major spill (more than 200litres per spill) and submit form PP/11.

5.4.10 Legislation related to vessels under pressure

Under section 89 of the 1997 Health and Safety Regulations in the Labour Act the following will be applicable for Vessels under Pressure:

The user, occupier or person owning or leasing a boiler, pressure vessel, air receiver or other vessel under pressure, shall cause or permit such boiler, receiver or vessel to be used or operated only –

- a. in accordance with a permission issued by an inspector;
- b. if inspected and maintained in accordance with these regulations in regard to boilers and pressure vessels; and
- c. in compliance with these regulations.

The Chief Inspector may, in accordance with regulation 18, approve an inspection authority to perform the inspection duties specified in this regulation.

The Proponent therefore needs to apply for the required permission to operate pressure vessels. A preferred tanks inspector should also be approved by the Chief Inspector from the Ministry of Labour.

5.4.11 Legislation related to Public Roads

The Advertising on Roads and Ribbon Development Ordinance 30 of 1960 regulates the display of advertisements near public roads, the erection of structures near certain proclaimed roads and access to land from such roads.

The functions assigned to the Minister by this Act have been assigned to the Roads Authority established by the Roads Authority Act 17 of 1999.

Under this Act, the Roads Authority was established as the juristic person to manage the national road network of Namibia with a view to establishing a safe and efficient road sector. The functions of the Roads Authority, as defined by this Act, are to advise

the Minister or an approved authority on any matter relating to the planning, design, construction and maintenance of roads, whether such roads are part of the national road network or not.

Also of significance to this project, and as listed under Part III of this Act, is that the Minister may prescribe minimum standards and measures for the management and maintenance of the public roads between Karibib and the Project Site.

With the intention to transport the product to the nearest port, i.e. Walvis Bay, the increased heavy vehicle traffic on the gravel road to Karibib may cause an increased deterioration rate of this road.

6 Description of the Local Environment

This section describes components of the existing environment that could be affected by the Proposed Action. The environmental components described include climate, air, water, land use and socioeconomics.

6.1 Current land use

The NAMAGRA Mine site is located on private land, Farm Habis 71. The farm owner has an agreement in place with NAMAGRA. Currently no farming activities are conducted by the farm owner on the land that is allocated to NAMAGRA.

6.2 Water: A brief Overview

Rainfall distribution throughout Namibia is extremely variable with evaporation in excess of precipitation (Figure below). Water availability in general is also variable from one year to the next, making arid and semi-arid regions, such as Namibia, very vulnerable to a succession of dry years. These variations can be attributed to changing weather conditions and, to some extent, (increasing) water-use demands.

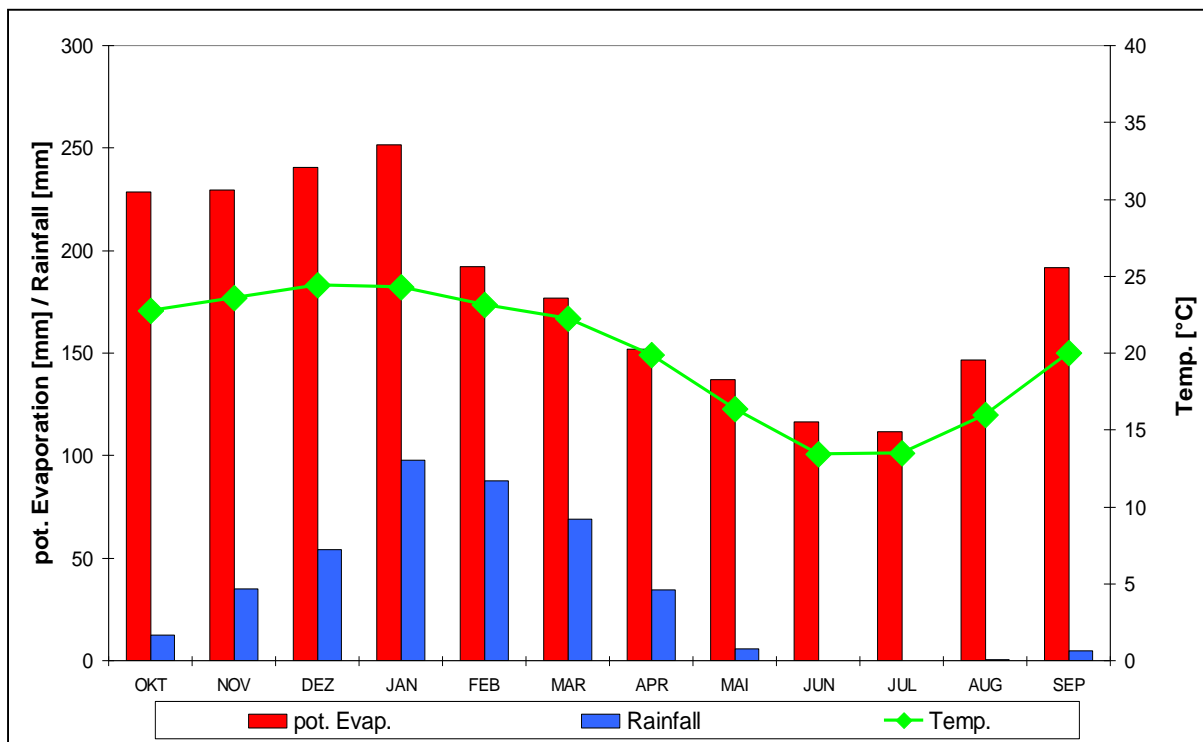


Figure 11: Potential evaporation, rainfall and temperatures in Namibia. (Source: MAWF)

Among the greatest single factors influencing the availability of fresh water is human population growth and industrial activities. Higher population numbers, coupled with increasingly higher standards of living, elevates the demand for finite quantities of water and intensify competition and tension among users. With increasing urbanization, industrialization and other developments (e.g. mining) in different parts of the country the demand for more water continues to be a challenge.

Economically viable groundwater resources in Namibia come mainly from porous (unconsolidated deposits) and fractured aquifers (hard rock terrain). Regional fractured aquifers are characterized by fractured hard rock with secondary porosity and permeability, and include dolomitic and quartzitic rocks, respectively.

The amount of groundwater available at any given time is dependent on the hydrogeological settings of the area and rainfall or artificial recharge.

Surface water in Namibia is generally very limited and regarded as precious resources where they are available all year round. Fresh water used at NAMAGRA is transported to the mine site. Rain water that collects in excavations and pits on the mine is used for industrial and processing activities.

6.3 Terrestrial Ecology

Red data plants

The Namibian red data list (RDL), consisted of 1,152 taxa in 2004 and was still preliminary since ongoing studies and fieldwork are continuously being undertaken to verify existing information and to gain new insights in areas of uncertainty. The RDL only features spermatophytes (i.e. plants that reproduce by means of seeds) due to the lack of knowledge and data about the taxonomy and distribution of lower plants. The Table below shows the outcome of the red data plants assessed for Namibia while the figures below shows the proportion of confirmed endemics, near endemics and suspected endemics of these red data plants.

Plant Red Data List assessment for Namibia.

Category	Number of taxa
Spermatophyte taxa in Namibia	3961
Taxa on the RDL	1152
Critically endangered (CR)	8
Endangered (EN)	80
Vulnerable (VU)	199

Lower-risk near threatened (LR-nt)	84
Lower-risk least concern (LR-lc)	516
Data deficient (DD)	265
Endemics with RDL assessment	433
Endemics that are EX, ExW, CR, EN & VU	179
Taxa known from one specimen only	>45

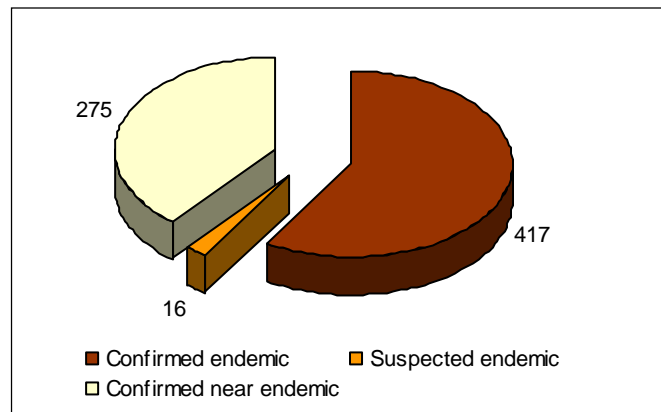


Figure 12: Endemism of taxa on the RDL. (Source: Vital Signs of Namibia 2004)

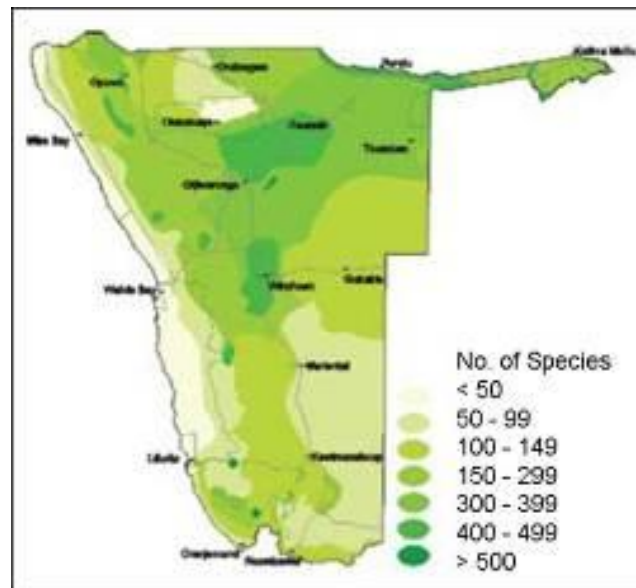


Figure 13: Plant diversity in Namibia. (Project Area - 100 – 149 Species)
(Source: Vital Signs of Namibia 2004)

6.4 Biodiversity in general

Namibia's biodiversity generally occurs from the central parts of the country (Khomas region) toward the central north and east. Biodiversity is generally higher in the central and north central areas (for major taxonomic groups such as reptiles, amphibians, birds,

plants and mammals) with lower biodiversity along the coastal zone and in the south, from the northern boundary of the Hardap region.

6.4.1 Avifauna

Avifaunal diversity in Namibia is shown in the figures below. Species diversity in the project area ranges from 81 to >110 species. The conservation status of all recorded/known bird species in Namibia although the geographic distributions of these are not indicated.

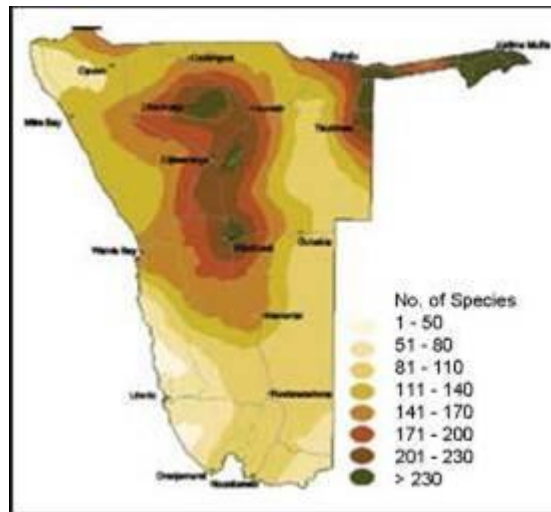


Figure 14: Bird diversity in Namibia. (Source: Vital Signs of Namibia 2004)

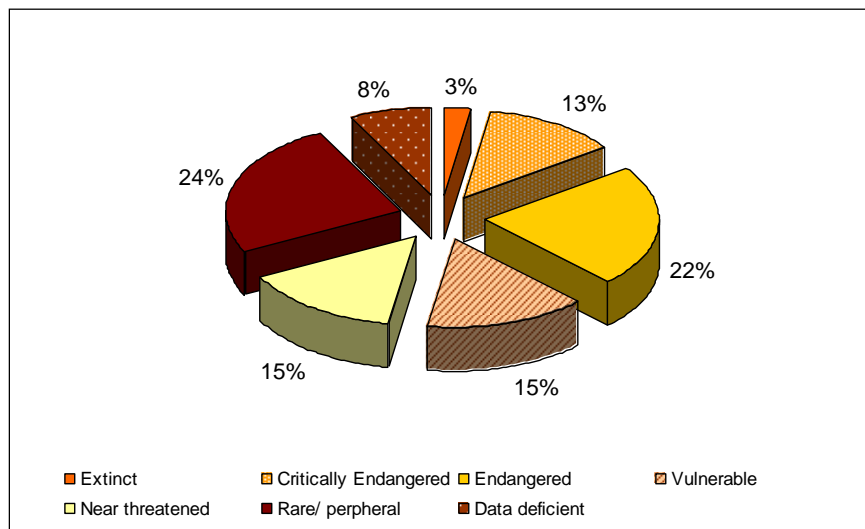


Figure 15: Conservation status of red data birds in Namibia. (Source: Vital Signs of Namibia 2004)

6.4.2 Mammals

Larger mammals, especially those of economic value, have undergone major reductions in their distributional ranges in the past. The populations of many species (e.g. rhinos, elephants, various antelopes) have recovered/ increased over the past 10 years due to increased conservation measures such as the establishment of communal conservancies, community forests (CFs) and expanding the protected area network in Namibia. Recent and current donor funded initiatives strengthens the capacities of the Ministry of Environment and Tourism (MET) to improve the management effectiveness in parks, the natural resource management capacities of communities in conservancies and CFs and the availability and reliability of scientific information and data about mammals.

Little evidence of wildlife fauna were observed during the site visits. This can be attributed to the fact that human activities such as livestock herding occur within the subject area. Because of human interference wildlife species usually move to less disturbed areas. Insects and lizards are known to be common this area.

6.4.3 Ecological Sensitivity

The project area is located towards the south of Karibib and conservation measures are essential to ensure the success of large mammals and their habitats and/ or ecosystems they rely on are protected. Mining and large scale exploration is extremely destructive as it clears large tracts of land and removes/ moves large volumes of sand which destroys habitats, fragments ecosystems and negatively impact son scenic landscapes.

The project area is however has low diversity and endemism of birds, amphibians, plants and large mammals. The specific area earmarked for activities, however only represents a fraction of the overall ecosystems/ landscapes transcending these human boundaries. The impacts at the mining operation are limited to the existing pit and excavated areas. The impacts with regard to the alteration of the landscape are irreversible impacts but it is limited to one mountain range on the farm.

6.5 Air Quality

6.5.1 Existing sources of atmospheric emissions

Activities like, drilling, cutting, crushing and vehicle traffic are the main dust emissions sources on the mine site. The Proponent currently uses a wet cutting method and have invested in equipment that generate limited dust during operations. The wider area is characterized by mountain ranges, rocky outcrops and grass fields.

Air quality data was not readily available for the area which makes it challenging to quantify the emissions and consider their values in relation to extreme high and low values elsewhere.

As Namibia is known as a sink and not source of CO² and other ozone depleting substances, the assumption used here is that the emissions are insignificant in relation to the magnitude of emissions experienced at other mines and associated with other industrial processes.

6.5.2 Fugitive dust releases unrelated to mining

Fugitive dust unrelated to mining only includes dust generated by vehicles driven in the area on gravel roads.

6.6 Noise and Vibration

Ambient noise in the mining area is currently significant, especially when in close proximity to operational equipment. Access to the mine is controlled and there are also no other land use activities that is in conflict with the Proponent.

6.7 Heritage and Cultural Resources

Based on background information reviewed and discussion held with the Proponent, there are no known areas of heritage and cultural importance in the mining area.

6.8 Visual

Exploration and mining activities are normally associated with negative visual impacts. The area **has** changed due the ongoing activities. Exploration and mining activities are

extremely invasive as it entails the removal of large volumes of earth and vegetation, the use of trucks and earthmoving equipment and, an influx of workers who will require temporary shelter.

All of these elements involved in the exploration and mining contribute to negative visual impacts in an area. It should however be stated that exploration and mining would not be new to this area since there are a number of quarries in the Karibib area.

The area that is affected is not on a tourist destination, and is also not visible from the public roads.

6.9 Social

The number of people currently employed is 22. It is not expected to employ more people at this stage. Unemployment in the local community is perceived to be high. The mine nevertheless contribute positively towards the economic development of the area.

Secondary spin off jobs also lead to additional employment opportunities. The Namibian 2011 Preliminary Census Results, and other Social Impact Assessment reports for the mining and exploration developments taking place in the Erongo Region was reviewed to ensure regional social economic are taken into consideration.

According to the “**NAMIBIA 2011 POPULATION AND HOUSING CENSUS PRELIMINARY RESULTS**” the total Namibian population is estimated at 2,104,900 people. The Erongo Region has the 7th highest population and is currently estimated at 150,400 people. (See figures below)

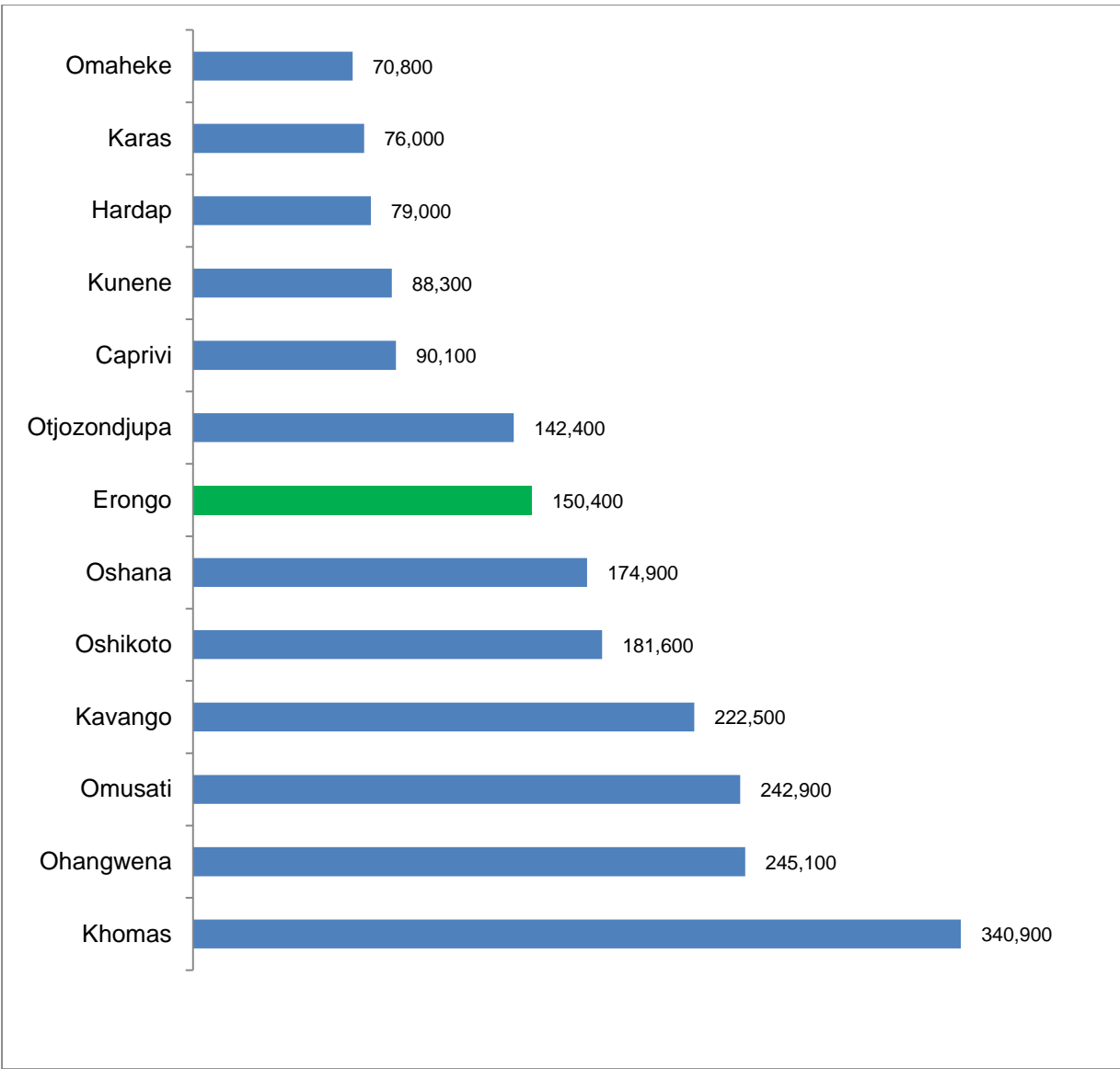


Figure 16: 2011 Provisional Namibian Census Results

The Erongo Region has experienced a considerable population growth over the last 10 years. During 2001, 5.9% of the total population resided in the Erongo Region. The current estimations indicate that 7.1% of the total population resides in the region. Swakopmund and Walvis Bay were the major centers of growth.

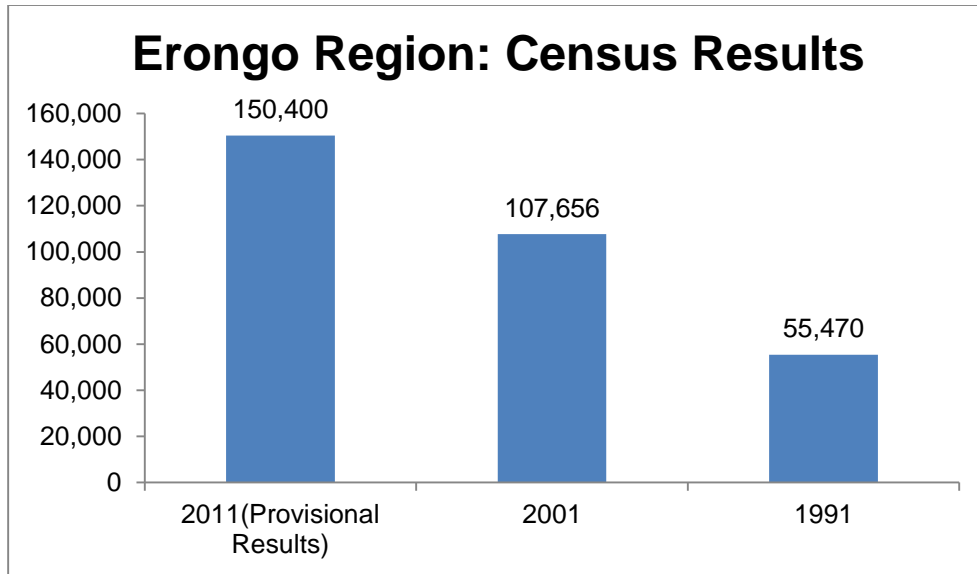


Figure 17: Erongo Region Population Growth (*The 1991 results excluded Walvis Bay Town, which was not part of Namibia at that time*)

The population of the project area has not been affected by the growth experienced in the major coastal towns, although there has been an overall increase in the number of inhabitants in the Erongo Region. It is the objective of the Proponent to ensure the local community also benefits.

7 Stakeholder Consultation

The purpose of stakeholder consultation is to increase awareness by involving people who are directly affected or concerned about this development. This should be a vital factor during the planning and success of the development. Allowing public approval gives assurance and a sense of partnership with the developer and prevents unnecessary disputes and costs during the establishment of the project.

The Proponent has a Mining Licence, (ML 142) and has been operating the mine since 1992. There is also an agreement in place with the Land owner and the Proponent. A monthly fee, for the use of the farm, is also paid to the Land owner as part of the agreement.

8 Potential Social and Environmental Impacts

In this chapter, environmental impacts associated with the mining operations are summarised. The potential impacts associated with the mining activities are presented, together with suggested mitigatory measures required to ensure impacts are managed effectively.

An Environmental Management Plan (EMP) is a legally binding document and will form the basis of the environmental contract between The Proponent and the Ministry of Environment and Tourism (MET). In this way, the EIA report and EMP report will assist both the Proponent and the MET in ensuring impacts to the environment are minimized during this project.

The below table summarizes the key issues and potential impacts as identified using the information presented above on the descriptions of the planned operation and the existing environment.

KEY ISSUE	IMPACTS
Biophysical environment	<ul style="list-style-type: none">- Impact on land surface during mining and exploration operations- Alteration of the landscape
Pollution and waste management	<ul style="list-style-type: none">- Waste (domestic and other) generated during pre-operations and operations- Air pollution during operation (Dust and CO₂ emissions from heavy equipment)- Discharging of solid wastes- Discharging of liquid wastes
Other issues	<ul style="list-style-type: none">- Visual impact through existence of the a mining area- Heavy Vehicle Transportation impacts- Noise nuisance impacts during operational hours

Within the accepted broad definition of the term “environment” that applies to Environmental Impact Assessments, it is required to assess potential socio-economic impacts as part of this study. The significance of the impact and the resulting management priority arising from the occurrence of an aspect is considered to be a function of the two factors described below:

1. Likelihood of the impact:

An environmental aspect is considered to be the “trigger mechanism” that will result in the occurrence of the environmental impact or consequence. The potential significance of the impact is therefore a function of the likelihood that the impact will occur. (Note: The assessment of likelihood is specific to the occurrence of the aspect and not the activity). The likelihood of an impact is related to the level of control associated with the activity under normal and abnormal conditions and the potential for accidents to happen. A score is allocated to each impact according to the following table:

Likelihood	Highly likely	3
	Could Occur	2
	impossible	1

2. Consequence of the impact:

Assuming that the impact has taken place, the consequences of the impact is assessed. The effect of pollution to the environment and the business are considered when determining the consequences. A score is allocated to each impact according to the following table:

Consequence	Severe effect	3
	Medium effect	2
	Minor effect	1

Overall Impact Rating:

The likelihood and the consequence scores are then multiplied to allocate an overall rating.

High	7 to 9
Medium	4 to 6
Low	1 to 3

8.1 Potential Socio-Economic Impacts

Within the accepted broad definition of the term “environment” that applies to Environmental Impact Assessments, it is required to assess potential socio-economic impacts as part of this study.

Potential socio-economic factors that are typically taken into account in the process associated with an Environmental Impact Assessment are listed below, with a brief comment made in each case as to their relevance and significance to this particular project

8.1.1 Changes in employment opportunities within the region

The size of the mining and processing activities at the mine is regarded as a largest scale operation. The operation is of a highly mechanized and automated nature and is therefore not a large employer compared to other mines in Namibia. The operations are highly mechanized and of an automated nature.

The mine currently employ 22 people. It is not possible to estimate the number of secondary and temporary jobs that are created as a result of the mine’s existence. Secondary spin off jobs in the off-site service industry, normally lead to additional employment opportunities. It is also a good initiative to source the labour requirements from the Erongo Region.

8.1.2 Secondary business opportunities

Given that this operation is a medium sized employer, it is recommended that the businesses of the surrounding areas be considered if any secondary business opportunities become available.

To ensure any secondary business opportunities benefit the local community as a whole as opposed to only a few individuals, it is recommended that this issue be further discussed amongst community leaders or local politicians in order to initiate and implement any such plans.

Summary of potential socio-economic impacts:

Impact Description		Type	Assessment without Mitigation			Mitigation	Assessment with Mitigation		
			Likelihood	Consequence	Rating		Likelihood	Consequence	Rating
Influx of people to the area	Increased demand on housing: Creation of squatter communities	Negative	2	2	Medium	The Proponent should ensure employees are provided with sufficient resources to minimise additional impacts on the local community. .	2	2	Medium
	Potential increase in crime rate	Negative	2	2	Medium	Create awareness among employees and Increased security services	2	2	Medium
	Increased demand on medical services - Limited medical emergency preparedness	Negative	3	2	Medium	Establishment of a well-equipped medical centre	2	2	Medium
	Additional employment opportunities	Positive	3	2	Medium	Ensure local people are given priority when positions become available	2	2	Medium

8.2 Environmental Impacts

Potential environmental impacts associated with the envisaged development are listed below, with a brief comment made in each case as to their relevance and significance to this particular project.

8.2.1 Impacts related to air quality and dust

Impacts from mining and exploration activities:

In any mining operation dust is generated. The major sources of dust would be ore dust from drilling, earth moving, and diamond cutting operations. Heavy vehicles driving in the area may be the most significant contributor to dust.

Employees working at the site may also be exposed to dust and it is a potential health risk because inhalation of fine dust particles can damage the lungs and lead to chronic obstructive pulmonary disease. Winds can disperse inhalable dust from the mine over to

adjacent farmland. An important objective of air quality management is to ensure that communities are not affected by emissions from the mine.

Another impact of dust deposition is on the environment. The most obvious effect will be observed on vegetation next to the operational areas. Dust covers the surfaces of leaves, blocking stomata and thus reducing photosynthesis. A decline in vegetation can create a secondary impact on wildlife and livestock by reducing the availability of fodder.

Compliance:

The following compliance standards are applicable to dust emission:

- The Namibian Labour Act's Health & Safety Regulations set the following limits for personal exposure over 8 hours time-weighted average: Total particulates of **10 mg/m³**.
- The Atmospheric Pollution Prevention Act (No 45 of 1965), which is still applicable in Namibia, does not set specific limits for dust emission.
- In terms of the South African Department of Environmental Affairs and Tourism's criteria, dust deposition is classified as follows:

SLIGHT	<250 mg/m ² /day (barely visible to the naked eye)
MODERATE	250 to 500 mg/m ² /day
HEAVY	500 to 1 200 mg/m ² /day (fine layer of dust on a surface)
VERY HEAVY	>1 200 mg/m ² /day (easily visible with irregular cleaning of surfaces)

Mitigatory Measures:

Identify and monitor all emission sources

All the potential dust generating sources should be identified and an inventory should be established of the potential dust sources. Visual observations and dust monitoring should be used to identify additional problem areas and quantify dust emissions levels. An important part of air quality management is the collection of climate data because wind patterns determine the extent and direction of dust plumes.

Prevent health impacts to the employee and the public:

Personal Protective Equipment (PPE) should be provide to all employee that may be exposed to dust. All employee are also sent for annual medical checks.

Reduce emissions during operation:

Currently wet cutting is done to prevent the generation of dust. Effective dust control measures must be included in material transport and handling systems designs.

Disturbed or mined-out surfaces must be stabilized, e g by water spraying, and rehabilitated as soon as possible.

8.2.2 Impacts related to the degradation of land due to mining

Impact Description:

Land degradation would be one of the most significant impacts arising from mining activities. The landscape at the mine has been disturbed by the current mining activities. The activities has permanently altered the landscape due to excavations, stockpiling and the dumping of overburden material.

Grazing areas adjacent to the mining activities could potentially also be affected due to windblown dust settling in the grasslands. The impact would therefore not be limited to the mining area. The farm owner is currently not using the section of land that is used by the proponent for mining and exploration activities.

Mitigatory Measures:

A mine plan should be maintained to prevent haphazard excavations and trenching. The Proponent should limit mining activities to within the boundaries of the allocated area. Rehabilitation should be done on a continuous basis, i.e. as soon as the mining in an areas has been completed, rehabilitation should be initiated. The mining area has been clearly demarcated to prevent movement of animals and people into the mining area. Clearly marked access routes has been established to ensure mining activities does not conflict with the movement of the public.

8.2.3 Impacts related to the availability of fresh water

Impact Description:

The operations require fresh water for human consumption and ablution facilities. Freshwater is transported to the site and stored in a tank. Water for dust suppression is sourced from the rain water dam. The marble extraction process is not a water intensive operation. The water requirements will not significantly impact on the availability of fresh water in the area.

Mitigatory Measures:

The Proponent should ensure that water from the mining and exploration activities is obtained from the rain water dam. Should the abstraction of water from boreholes be

considered it should be done in consultation with the Department of Water Affairs and Forestry and the local community.

8.2.4 Impacts related to the loss of biodiversity

Impact Description:

The areas currently mined is on a high lying rocky outcrop. New exploration activities will further degrade the area. Wild animals i.e. game, insects and birds will move away from the area. The impact would potentially not be limited to the mining area since noise would also affect the occurrence of species in the nearby vicinity.

Mitigatory Measures:

The area is currently used for economical purposes since 1992 and is significant to the local and national economy. There will be loss of biodiversity in the immediate project area. It should however be noted that wild animals still frequent the area and have not moved away entirely. It is essential that rehabilitation is done on a continual basis to ensure the visual appearance of the area is improved if practical possible.

8.2.5 Visual amenity impacts

Impact Description

The structures, equipment and activities will be intrusive on the landscape. If operations are conducted at night, the lighting that will be used may be a nuisance.

Mitigatory Measure

The mining activities will not be visible to the public driving in the area. It will only be visible from the access route in the mine area.

The Proponent should strive to erected onsite structures that will compare with international best practice. The lighting that will be used on the premises for security and other purposes should be installed in such a manner that it does not cause annoyance to the neighbouring landowners.

8.2.6 Impacts related to domestic sewage effluent disposal

Impact Description

22 employees reside at the mining area. Ablution facilities for workers is available onsite. Sewage or domestic effluent will be generated and could potentially pollute the area if not managed properly.

Mitigatory Measure

All ablution facilities that will be available should be of suitable best practice standard to ensure hygienic conditions.

8.2.7 Impacts related to solid waste disposal

Impact Description

Solid waste will mainly be generated from the maintenance activities. Hazardous wastes e.g. hydraulic oils from heavy equipment will also be generated.

Mitigatory Measures

All waste should be collected and contained for final disposal at an approved landfill site. Recycling of solid waste is encouraged to minimise the amount of waste that goes to landfill. Hazardous wastes should be collected and stored in closed containers. Once these containers are full it will be transported to the nearest hazardous waste disposal site, which is Walvis Bay.

8.2.8 Impacts related to increased heavy vehicle traffic volumes

Background and description of the impact:

Once the blocks has been extracted it will be transported by truck via the C32 secondary road to Karibib for final delivery to the clients.

The C32 is a gravel road is used by all the other mining and quarry operations in the area. The condition of the road is affected by the increased heavy vehicle traffic.

Mitigation:

Whether the operation is established or not, the traffic volumes on the roads are expected to continue and this is not an aspect that can be controlled by the Proponent. The Proponent should however ensure that trucks are not overloaded and that the operators

of trucks and any other vehicles are properly licensed and are medically fit to operate their respective vehicles. The 5km access road to the mine site is maintained by the Proponent.

The product is transported to the Karibib railway station, loaded onto rail trucks and transported to the clients. The Proponent has opted for this mode of transport to minimise heavy vehicle traffic on the national roads.

Furthermore, access to emergency response teams should be ensured in the event of an accident or spillage incident.

8.2.9 Impacts related to Heritage and Archaeology

Background and description of the impact:

Potential impacts to artefacts may arise from excavation activities. Buried archaeological remains and deposits, or cultural significant features are however, not known to exist on site.

Mitigation:

There is no known heritage or artefacts that are known to occur at the project site. If such sites are discovered during the site establishment phase it is vital that they are reported for possible conservation.

9 Summary and Conclusions

This document highlights the impacts for the current activities. It can be concluded that if the necessary mitigatory measures are implemented the potential impacts associated with the mine can be minimized. The mining area will further be degraded but it will be localised to the area. Vegetation that occur on the project site is not limited to the area.

Key findings of the Environmental Impact Assessment Study indicate that the project can be implemented, provided the recommended control measures are implemented.

- The site that is used for mining is not regarded as a sensitive biodiversity area.
- There are some negative impacts that can affect the mine. These impacts do not necessarily have a negative impact on the biodiversity of the surrounding environment.

- The mine is significant for the local economy and boosts the town of Karibib and the local communities. It also create employment opportunities. Secondary business opportunities has been established as a result of this operation.
- The socio economic impacts associated with the scale of this project will not negatively affect the socio-economics of the area.

It is also imperative that Proponent ensures the mitigatory measures are incorporated and adhered to. It is therefore recommended that these mitigatory measures form part of a legal agreement between the relevant parties.

10 Appendix A – Mine Production Figures

11 Appendix B – Environmental Assessment Practitioner

Alan Jenneker - Resume



PERSONAL DETAILS

Date of Birth: 17 May 1969
Birth Place: Windhoek
Gender: Male
Nationality: Namibian
Marital Status: Married
Home Language: Afrikaans
Other Language: English (speak, read, and write)
Driver's license: BE (Light vehicle) & A (Motorcycle)
Residential Address: 53 Franke St, Vineta
Swakopmund
Namibia
Telephone (Home) +264 64463461
Office: +264 64404438
Mobile: +264 811227891

KEY AREAS OF COMPETENCE

- Project Management – (Environmental Management, Safety and Software Implementation projects)
- Management Systems Implementations (ISO 14001 / OHSAS 18001, Namibian Legal Compliance)
- Environmental Assessment Process (Environmental Impact Assessment, Environmental Management Plans and Strategic Environmental Assessments)
- Safety and Environmental Auditing
- Risk Assessments (Safety & Environmental)
- Software & Database Development using MS SQL Server, MS Access & Visual Basic for Applications.

EDUCATION AND TRAINING

- 1990 National Diploma Chemical Engineering: (Cape Peninsula University of Technology- South Africa)
- 1992 Handling of Chlorine Gas (Department Of Water Affairs, Namibia)
- 1995 Environmental Management ISO 14001 Course – Johannesburg, South Africa

- 1996 Arthur D Little HSE Auditor's Course (USA Accredited course) - Swakopmund, Namibia
- 1997 MS SQL Server & MS Access Database developer Course – Windhoek, Namibia
- 2006 IEMA approved Health, Safety and Environmental Auditor (ISO14001 & OHSAS 18001) – Stellenbosch, South Africa

PROFESSIONAL EXPERIENCE

Technical Experience

November 1999 – Current Business Owner, EnviroSolutions Swakopmund

Current Roles and Responsibilities

Business Management	<ul style="list-style-type: none"> • Project Management • Human Resources Management • Sales and Customer Care • Financial Management and Preparation of financial information – (for financial auditors)
Environmental Impact Assessments (EIA)	<ul style="list-style-type: none"> • Managing the EIA processes and oversee the development of Environmental Management Plans (EMP's)
Management Systems	<ul style="list-style-type: none"> • Implementation of management systems using ISO 14001 and OHSAS 18001
Software Development	<ul style="list-style-type: none"> • Oversee the development of Ms Access, Web based and SQL Server Database projects • Development and maintain various Health, Safety and Environmental databases for a wide range of clients
Weather Monitoring	<ul style="list-style-type: none"> • Sales, Distribution, Maintenance of Davis weather stations in Namibia Interpretation of weather data and compilation of weather reports

Projects completed during the past 4 years

The projects listed below are some of the key projects that was completed recently.

Project Type	Short Description
Management Systems:	<ul style="list-style-type: none"> • ERONGO RED: Implementation of ISO 14001 & OHSAS 18001 • INDONGO Toyota: Eco Audit and Implementation of ISO 14001 • GRINROD Terminal – Walvis Bay Port: - ISO 14001 Implementation • AREVA Processing: Assist with the implementation of OHSAS 18001 management system
Audit /Risk Assessment	<ul style="list-style-type: none"> • Risk Assessment at Namibia Breweries Ltd processing facility • Risk Assessment for Commercial Cold Storage - – Walvis Bay Port • Audits Aquatic Marine Engineer, RJ Southey - Walvis Bay
Environmental Impact Assessments	<ul style="list-style-type: none"> • Water front Development: Misty Bay - Walvis Bay • Quarry Activities: Rössing Mountain and the Walvis Bay Municipal area • Tourist Lodges; Sadadi- Okombahe, Ozohere- Uis,

And Environmental Management Plans	<ul style="list-style-type: none"> Namibia Poultry Industries: Hatchery, Broiler and Chicken Abattoir Strategic Environmental Assessment for the coastline between Swakopmund and Walvis Bay Residential Developments; Finkenstein, Sonnleiten, Henties Bay Extension 10 Exploration and Mining Project EIA's – Otjozondou, Aurum Namibia Fuel Storage Facility EIA's at Ondangwa, Windhoek, Walvis Bay Cell phone tower installations in Namibia for AGA Technical Services, MTC Namibia and PowerCom Sand Mining activities in the Swakop River
Weather Monitoring Instruments– Davis	<ul style="list-style-type: none"> Commissioning of various weather stations in Namibia. Develop a weather database for the weather stations in the Naukluft Park. (The database is primarily used to compile wind roses and provision of the weather statistics) Maintenance, sales and servicing of weather stations

Other relevant completed in the last 4 years

Project Type	Short Description
EIA and EMP's	<ul style="list-style-type: none"> Establishment of a Super Dairy Farm near Mariental, Namibia (<i>Namibia Dairies</i> Pty Ltd - O&L)
	<ul style="list-style-type: none"> Floating Dry Docks Walvis Bay, Namibia (Elgin Brown and Hamer)
	<ul style="list-style-type: none"> Gypsum Mine Naukluft Park, Namibia (Elspe Minerals)
Coastal Policy Development	<ul style="list-style-type: none"> Monitoring and Evaluation Specialist for the NACOMA Project - Swakopmund
Software / Database Development	<ul style="list-style-type: none"> Development and installation of Radiation Control software for AREVA, HSE database for Langer Heinrich Mine, Develop and install HSE databases for Roads Contractor Company and Telecom Namibia

During the last 12 years I have worked on a number of Health, Safety and Environmental projects, as a project manager. The key purpose of the above summary is to indicate my abilities and the level of experience.

COMPUTER LITERACY	
Applications	Experience Rating
Microsoft SQL Server	Good
Microsoft Access	Excellent
Visual Basic for Applications	Good
Microsoft Word, Excel, PowerPoint	Excellent
Lakes: Wind-Rose Software	Excellent
Web Site design: Dream Weaver, Page Breeze	Good

PREVIOUS WORK EXPERIENCE

1994 – 1999:

Rössing Uranium Mine, Swakopmund, Namibia: Senior Environmentalist

- Part of the implementation team that was responsible for the implementation of the Environmental Management Systems (ISO 14001)
- Monitoring of environmental aspects e.g., air quality, noise, radiation, fumes and gases
- Safety and Environmental auditing
- Develop and maintain the Environmental, Medical Surveillance and Occupational hygiene databases.

1990 – 1994:

Department of Water Affairs, Windhoek, Namibia: Chemical Technician

- Carry out audits at Landfill sites, Mining operations, factories & wastewater disposals facilities in Namibia for water pollution control purposes,(Water Act)
- Provide guidelines to the Government water treatment facilities on effective water purification methods.

1989 – 1990:

Consolidated Diamond Mines, Oranjemund, Namibia: Trainee Metallurgist

- Metallurgical Plant operator in the diamond extraction process

LANGUAGE PROFICIENCY

	Reading	Writing	Speaking
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Excellent	Excellent

REFERENCE

Mr. Jan Everson

Seal Consulting Engineers
Business Owner – Civil Engineer
Walvis Bay
Ph: + 26464209810 or +264811284118

Mr. Justice Tsauseb

Skorpion Zinc Mine
Health, Safety and Environmental Manager
Rosh Pinah
Ph: + 264632712324 or +264811223533

EAPAN



ENVIRONMENTAL ASSESSMENT PROFESSIONALS OF NAMIBIA

***CERTIFICATE
OF
PROFESSIONAL
MEMBERSHIP***

This is to certify that

Alan Jenneker

was accepted as a

"PRACTITIONER"

On this 4th day of October 2012

President

Secretary

Membership number: 119