ENVIRONMENTAL ASSESSMENT

FOR THE PROPOSED MINERAL EXPLORATION ACTIVITIES ON EPL 7986 IN ARANDIS, ERONGO REGION-NAMIBIA

ENVIRONMENTAL ASSESSMENT REPORT

FINAL

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Today for Tomorrow CC/2011/7445

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Acronyms

TERMS	DEFINITION
BID	Background Information Document
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
GHG	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
JBIC	Junior Baiano Industrial Consultants
MET: DEA	Ministry of Environment and Tourism's Directorate of Environmental Affairs
USTs	Underground Storage Tanks

EXECUTIVE SUMMARY

Junior Baiano Industrial Consultants (JBIC) cc has been engaged by Onaminda Investments cc to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed Base & Rare metals, Dimension Stone, Industrial Minerals, Nuclear Fuels, Precious metals and Semi-Precious metals exploration activities on EPL 7986 in Arandis, Erongo region and to apply for an Environmental Clearance Certificate for the proposed projects.

The proposed establishment triggered the application for an environmental clearance certificate.

Anticipated Environmental Impacts

- Low potential environmental impacts because mineral exploration drilling and pits do not require vast pieces of land.
- Some of the areas are already disturbed farming lands in Arandis.
- Adding on a management plan has been developed to mitigate any anticipated possible impacts of the project to the environment.
- Relative or moderate social impact (positive)

Social Impact

The project is generally expected to improve the socio-economic environment of Arandis through a major boost in business by means of integrations, employment and improved transport system on the long term. Interested and Affected Parties were notified of the project through site notices and newspaper adverts and all relevant information on consultation is covered in Chapter 4 of this document and Appendix A of the document.

Recommendation

It is concluded that most of the impacts identified during this Environmental Assessment can be addressed through the recommended mitigation and management actions for the proposed mineral exploration activities. Should the recommendations included in this report and the EMP be implemented the significance of the impacts can be reduced to reasonably acceptable standards and durations. All developments could proceed provided that general mitigation measures as set out are implemented as a minimum.

In this respect it is recommended that the proposed mineral exploration activities get an approval and receive Environmental Clearance, provided that the recommendations described above and the EMP are implemented.

1. CHAPTER ONE: BACKGROUND

1.1. INTRODUCTION

Onaminda investment cc has identified the dire need for continued mineral exploration and mining for economic development in Namibia. In this respect the proponent has taken on a venture to explore for Base and Rare Metals, Industrial Minerals, Non-Nuclear Fuel Minerals, Precious Metals and Precious Stones Groups of minerals on EPL 7986 in Arandis. The proposed venture is also in line with the Fourth National development plan-Namibia, by creating employment and targeting value additions of local resources before export to other countries.

Mining is a prescribed activity under the Environmental Management Act (2007) that requires an environmental impact assessment to be carried out before project implementation. In this respect, the proponent intends to conduct exploration activities and identify existence of minable minerals in the area and in compliance with Namibian environmental legislation.

An Environmental Scoping Assessment (ESA) was conducted to authorize the listed activities triggered by the project in terms of the Environmental Management Act (EMA), 2007, the EIA Regulations – 2012, the EIA policy of 1995 and international environmental treaties and conventions binding Namibia.

According to the Environmental Management Act (2007) and its Regulations (2012) the existing development requires an Environmental Clearance Certificate as specified in the following sections of the Act shown in Table 1: Listed Activities relevant to the project on the next page:

Table 1: Listed Activities relevant to the project

ACTIVITY	RELEVANT SECTIONS
MINING AND QUARRYING ACTIVITIES	- 3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992. -3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not. -3.3 Resource extraction, manipulation, conservation and related activities.

In respect of the commissioning of the mineral exploration activities in Arandis area, Junior Baiano Industrial Consultants cc has been consulted by the proponent to conduct an Environmental Impact Assessment (EIA) and to develop an Environmental Management Plan (EMP) for the undertaking of mineral exploration activities and to apply for an Environmental Clearance Certificate with the Directorate of Environmental Affairs.

1.2. PROJECT LOCATION

The proposed project will be established on EPL 7986 In Arandis - Erongo Region-Namibia. The EPL is located 6km east of Arandis Town and 2 km north of Rossing Uranium mine, Erongo region Namibia. The exact project site is depicted below:

The map below (Fig 1) gives an Arial view of the project site and exact project locality map.

1.3. INFRASTRUCTURE AND SERVICES

1.3.1. ACCESSIBILITY

An open road network exists. Access to the site is through existing Rossing uranium-Arandis road.

1.3.2. TOPOGRAPHY, STORM WATER AND EXISTING USAGE

The area is relatively undulated, because of the landscape and surface terrain the storm water and floodwater flow channels flow from the west to East. The area is not prone to flooding but experience rain water runoff during the wet season.

1.3.3. INFRASTRUCTURE AND SERVICES

- Borehole water capability of the area allows for borehole drilling to satisfy the operation's water requirements.
- During exploration phase, mobile temporary toilets will be used and these will be managed by an independent contractor.
- Electrical services will be linked to the existing electrical connections within the farms the EPLs are sited.

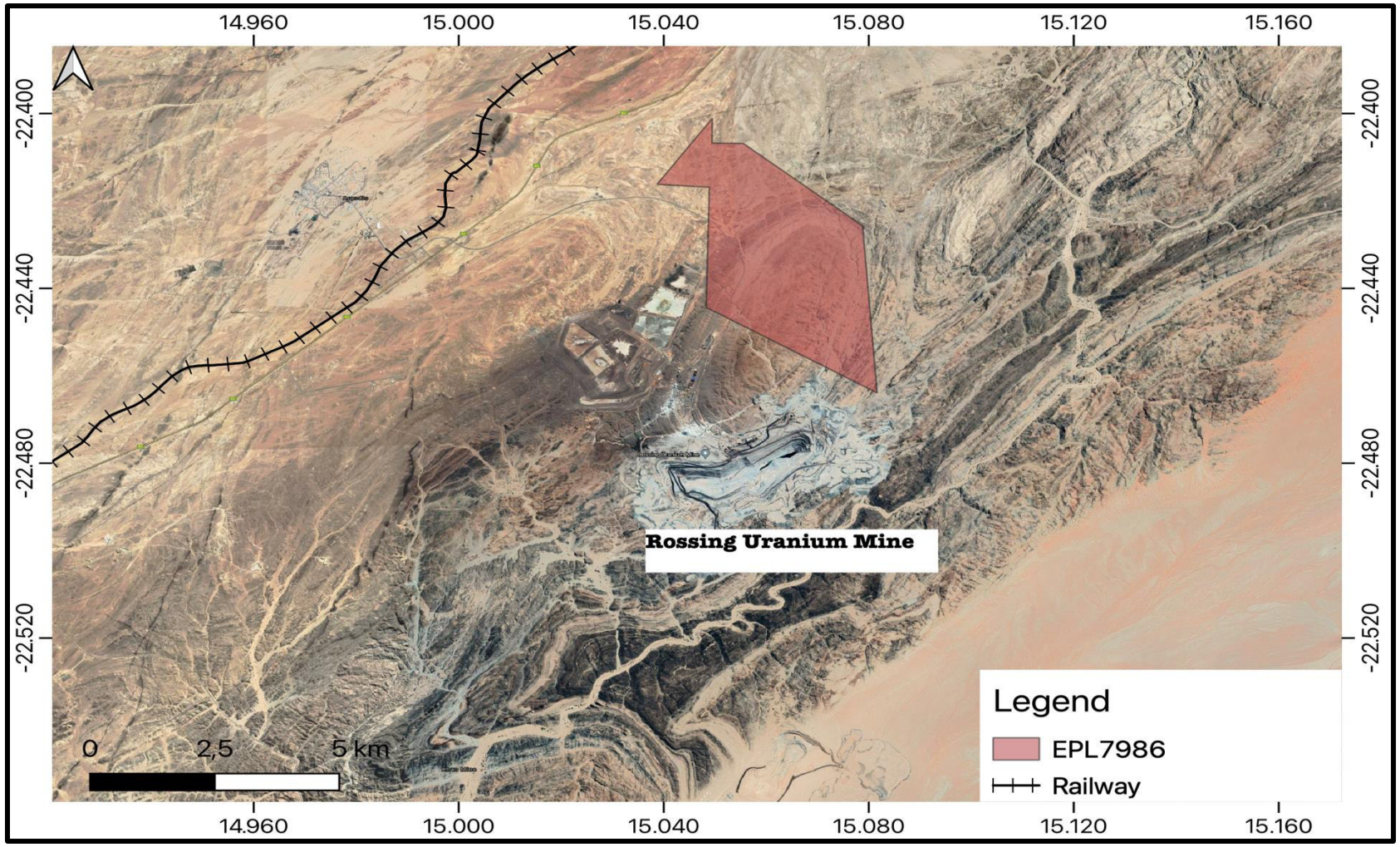


Figure 1: Proposed EPL Sites.

1.4. PROPOSED EXPLORATION METHODS

The following is the summary of the proposed exploration methodologies by Onaminda Investment cc with respect to EPL 7986:

- Satellite imagery;
- Geochemical sampling and analysis;
- Transient pulse;
- Radiometric;
- Ground Tellurics;
- Well Drilling (Stratigraphic).

The exploration methodology by the proponent is aimed at delivering the highest probability of drilling success at the lowest cost – within an African frontier context, where little is known about the geology and where onshore seismic would not be effective or technically feasible. Layers of satellite, airborne and surface exploration data where direct and indirect indications of minerals can be found at low cost. The combination of these layers gives the proponent understanding of the geological trap geometry, the nature of the base metals available and a 3D model of the potential reserve. We list five of the most important layers in the diagram.

The overall aim of the proposed project activities (exploration / prospecting programme) is to search for potential economic base metals resources within prospect area. The proposed exploration programme methodologies could be characterised into desktop, regional or local field-based activities summarised as follows:

i. Satellite imagery: Initial desktop exploration activities;
ii. Geochemical sampling and analysis: Regional field-based reconnaissance activities;
iii. Transient pulse: Regional or local field-based reconnaissance activities;
iv. Radiometric: Regional or local field-based reconnaissance activities;
v. Ground Tellurises: Local field-based reconnaissance activities;
vi. Well Drilling (Stratigraphic): Detailed site-specific field-based validation activities.

The field-based support and logistical activities will depend on the levels of the regional, local or site-specific activities being undertaken. The activities will be supported by existing tracks and campsites / farmstead.

In the absences of existing tracks, the field team will create such new tracks depending on the scale of exploration (regional, local or site-specific activities).

In the absences of existing suitable campsite / farmstead, temporary camp will be setup at suitable locations in line with the EMP provisions. The size of the exploration camp will be depending on the scale (regional, local or site-specific activities) of exploration being undertaken

1.5. OBJECTIVES OF THIS STUDY

This Environmental Impact Assessment is being undertaken in compliance with the Environmental Management Act No.7 of 2007 and the Environmental Impacts Assessments Regulations (GN 30 in GG 4878 of 6 February 2012). It is a prerequisite by the law to have an Environmental Impact Assessment carried out before the implementation of the prescribed projects as elaborated in the Environmental Impacts Regulations (GN 30 in GG 4878 of 6 February 2012). The main objectives of this study are as follows:

- To identify and provide mitigation measures of the expected impacts of the proposed establishment to protect the environment;
- To brief the Project Proponent of the legal and policy framework govern the proposed activity;
- To identify the possible changes in bio-diversity index that might be because of Project implementation in the area;
- To reflect on the various public concerns which will help the National Environmental Action Planners, economist and concerned stakeholders to make decisions;
- To come up with preventive and precautionary measures for the expected physical and biological environmental negative impacts associated with the proposed activities;
- To structure an effective environmental management plan for the sub division and servicing of the land facet to minimise and prevent negative impacts and maximise the positive impacts.

2. CHAPTER TWO: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

2.1. INTRODUCTION

An important part of the EIA is identifying and reviewing the administrative, policy and legislative situation concerning the proposed activity, to inform the proponent about the requirements to be fulfilled in undertaking the proposed mineral exploration activities.

This section looks at the legislative framework within which the proposed development will operate under. The focus is on the compliance with the legislation during the planning, construction and operational phases. All relevant legislations, policies and international statutes applying to the project are highlighted in Table 2 below as specified in the Environmental Management Act, 2007 (Act No.7 of 2007) and the regulations for Environmental Impact Assessment as set out in the Schedule of Government Notice No. 30 (2012).

The pursuit of sustainability is guided by a sound legislative framework. In this section, relevant legal instruments as well as their relevant provisions have been surveyed. An explanation is provided regarding how these provisions apply to this project

Table 2 - Legal Compliance

Aspect	Legislation	Relevant Provisions	Relevance to the Project
The Constitution	Namibian Constitution First Amendment Act 34 of 1998	- Article 16(1) guarantees all persons the right to property, to acquire, own and dispose of property, alone or in association with others and to bequeath such property. - "The State shall actively promote and maintain the welfare of the people by adopting policies that are aimed at maintaining ecosystems, essential ecological processes and the biological diversity of Namibia. It further promotes the sustainable utilisation of living natural resources basis for the benefit of all Namibians, both present and future." (Article 95(l)).	- The project will enable the full execution of right to practice any profession, or carry on any occupation, trade or business by availing necessary provisions such as practising any profession, or carry on any occupation, trade or business in the country. - Through implementation of the environmental management plan, the proposed mineral exploration activities will ensure conformity to the constitution in terms of environmental management and sustainability.
National Development Plans		- Namibia's overall Development ambitions are articulated in the National Vision 2030. At the operational level, five-yearly national development plans (NDP's) are prepared in extensive consultations led by the National Planning Commission in the Office of the President. The	- The proposed project will propel NDP4 targets in mining and development, adding on this will come with increased employment opportunities in the local

		Government has so far launched a 4th NDP focusing on high and sustained economic growth, increased income equality Employment creation.	communities and Erongo region at large.
Archaeology	National Heritage Act 27 of 2004	– Section 48(1) states that "A person may apply to the Namibian Heritage Council (NHC) for a permit to carry out works or activities in relation to a protected place or protected object"	– Any heritage resources discovered would require a permit from the NHC for relocation. – No heritage resources were identified during field transact assessment and upon consultation with the local community.
	National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979	– "No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: – Meteorites, fossils, petroglyphs, ornamental infrastructure graves, caves, rock shelters, middens, shells that came into existence before the year 1900 AD; or – any other archaeological or palaeontological finds	– The proposed site of development is not within any known monument sites, both movable and immovable as specified in the Act, however in finding any materials specified in the Act, contractors on site will take the required route and notify the relevant commission. – An archaeological impact assessment was deemed not necessary for this piece of land because of its locality and field reconnaissance survey conducted.
Environmental	Environmental Management Act 7 of 2007	– Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). – Requires for adequate public participation during the environmental assessment process for interested	– This Act and its regulations should inform and guide this EIA process. – The project proponent will ensure that all provisions of the mining EMP are implemented and regular

		and affected parties to voice their opinions about a project (Section 2(b-c)). - According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the Minister of Environment and Tourism or in a manner prescribed by the Minister. - Details principles which are to guide all EIAs	environmental compliance auditing conducted by independent consultants.
	EIA Regulations GN 57/2007 (GG 3812)	- Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). - Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15).	- This Act and its regulations should inform and guide this EIA process.
	Pollution and Waste Management Bill (draft)	- This bill defines pollution and the different types of pollution. It also points out how the Government intends to regulate the different types of pollution to maintain a clean and safe environment. - The bill also describes how waste should be managed to reduce environmental pollution. Failure to comply with the requirements considered an offence and is punishable.	- The project should be executed in harmony with the requirements of the act to reduce negative impacts on the surrounding environs from waste during construction or operation. - A waste management strategy that follows recycling, reuse and reducing will be commissioned throughout the operations.
	Soil Conservation Act 76 of 1969	- This acts makes provision for combating and for the prevention of soil erosion, it promotes the conservation, protection and improvement of the	- The Project impact on soil will rather be localised, however this document aims at guiding the

		soil, vegetation, sources and resources of the Republic of Namibia.	proponent during their mineral exploration activities to prevent soil erosion and contamination during operation.
	National Biodiversity Strategy and Action Plan (NBSAP2)	– The action plan was operationalised in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	– Forming part of the EIA of and EMP for this Project, the proponent will consider all associated impacts, both acute and long term, and will propose methods and ways to sustain the local biodiversity.
	Hazardous Substance Ordinance 14 of 1974	– Provisions for hazardous waste are amended in this act as it provides "for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances; to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance; and to provide for matters connected therewith"	– The proposed Mineral exploration operations will ensure that all possible "hazardous" categorised substances and waste will be handled by a certified hazardous waste handler.
	Atmospheric Pollution Prevention Ordinance 11 of 1976;	– This regulation sets out principles for the prevention of the pollution of the atmosphere and for matters incidental thereto. Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust	– The proposed mineral exploration activities will involve the use of combustible engines for vehicles and machinery, and thus

		atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.	appropriate vehicle servicing should be ensured to minimise pollution – Dust generation and release of other particulate matter should be minimised by following the dust suppression procedures in the EMP.
	Parks and Wildlife Management Bill of 2006;	– The act enacts the legal framework, to provide for and promote the maintenance of ecosystems, essential ecological processes and the biological diversity of Namibia, and the utilisation of living natural resources on a sustainable basis for the benefit of Namibians, both present and future, and to promote harmonious and mutually beneficial co-existence of humans with wildlife, to give effect to Namibian's obligations under relevant international legal instruments including the Convention of Biological Diversity – Provisions with regard to declaration of protected areas, entry into and residence are made in chapter V. Regulations on the protection of species of wildlife and plants are provided in Chapter VII of the Act.	– Because the proposed activities are to be conducted in a conservancy area, there is need to ensure that the Parks and Wildlife management bill is taken into consideration with great emphasis and compliance.
Forestry	Forest Act 12 of 2001	– Tree species and any vegetation within 100m from a watercourse may not be removed without a permit (S22(1) – Provision for the protection of various plant species.	– The clearing of vegetation is prohibited (subject to a permit) 100m either side of a river. Certain tree species occurring in the area are protected under this Act. Permits must be obtained from

			MAWF in accordance with the Act. However, on site there are no trees that require clearing permit.
Water	Water Act 54 of 1956	– The Water Resources Management Act 24 of 2004 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: – A permit application in terms of Sections 21(1) and 21(2) of the Water Act is required for the disposal of industrial or domestic wastewater and effluent. – Prohibits the pollution of underground and surface water bodies (S23(1). – Liability of clean-up costs after closure/ abandonment of an activity (S23(2)). – Protection from surface and underground water pollution	– The proposed mineral exploration activities will be using a dry process, hence water requirements for operations are minimal since most of the water will be for sanitation and domestic usage. – All relevant permits for envisaged boreholes will be applied for with the relevant department.
Health and Safety	Labour Act (No 11 of 2007) in conjunction with Regulation 156, 'Regulations Relating to the Health and Safety of Employees at work'.	– 135 (f): "the steps to be taken by the owners of premises used or intended for use as factories or places where machinery is used, or by occupiers of such premises or by users of machinery about the structure of such buildings of otherwise to prevent or extinguish fires, and to ensure the safety in the event of fire, of persons in such building;" (Ministry of Labour and Social Welfare). – This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices.	– The proponent will employ several people from the local and shall ensure securing a safe environment and preserving the health and welfare of employees at work. This will include applying appropriate hazard management plans and enforcing Occupational Health and Safety (OHS) enforcement by contractors.

	Public Health and Environmental Act, 2015	– Under this act, in section 119: "No person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health."	– The project will ensure compliance to the terms of the Act.
Mining	Minerals (Prospecting and Mining) Act, 1992	– The Minerals Act governs minerals prospecting and mining. The Act provides for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over minerals in Namibia; and to provide for matters incidental thereto. – The Act also ensures that mining entities undertake environmental responsibility which includes rehabilitation and waste management. – A new Minerals Bills is currently under preparation.	– This document has been conducted in compliance to the requirements of the Act, as well as ensuring that the sought after mineral exploration authotrisation is granted by the ministry of Mines-Namibia.
	Minerals Policy 2004	– The Minerals Policy is developed to ensure long-term sustainable growth in the mining sector of Namibia. One of the objectives of the Policy, relevant to EIAs is to ensure compliance with national environmental policy and other relevant policies to develop a sustainable mining industry.	– The fact that mining involved extraction/interaction with the natural resources, environmental responsibility will be ensured by the proponent as part of compliance to the Minerals policy. – Further on the policy calls for value addition, and the proposed project will entail mineral processing.
	Road Ordinance 1972	– Width of proclaimed roads and road reserve boundaries (S3.1)	– Although the project will not directly affect the major roads, the ore

Services and Utilities Infrastructure	(Ordinance 17 0f 1972)	- Control of traffic during operational activities on trunk and main roads (S27.1) - Infringements and obstructions on and interference with proclaimed roads. (S37.1) - Distance from proclaimed roads at which fences are erected (S38)	carrying trucks will at some point use the major roads. - No new road developments, power lines or sewer reticulation systems will be constructed, thus there will be minimal environmental impacts from Services and utilities infrastructure.

N.B: All identified crucial pieces of legislations will have to be adhered to by the proponent using different provisions and vehicles of compliance as indicated in their respective pieces of legislations. Where there is need to engage private consultants to facilitate compliance, the proponent is encouraged to consult qualified and certified personnel. Legal compliance auditing is to be done as part of all bi-annual reports to be conducted by the Environmental consultant.

Permits and licenses that are required, as part of compliance and authorization will have to be in place before operations commences. The most crucial license to be required before operations are as follows;

- Removal, destruction of indigenous trees, bushes or plants within 100 yards of stream or watercourse.
- Water abstraction permit, Effluent disposal permit
- Hazardous waste Storage/disposal /transportation permit
- Mineral Prospecting License

3. CHAPTER THREE: RECEIVING ENVIRONMENT

3.1. SOCIO-ECONOMIC

3.1.1. KEY POPULATION STATISTICS

Based on the latest census results (Namibia Statistics Agency (NSA), 2012) the total population for Arandis is approximately 5 132. The population of Arandis has increased by approximately 38%, from 3 726 in 2001. The estimated size of the informal settlement in the Usab suburban area is 450 (KTC, 2010). The annual growth rate for the Erongo Region is estimated to be 3.4 % based on the population growth between 2001 and 2011. However, this figure is expected to be slightly lower for Arandis. The percentage increase in urban population between 2001 and 2011 is slightly lower than the national average (approx. 43%). However, the annual growth rate for the Erongo Region is significantly higher than the national average (1.4%). The nearby farms within which the proposed exploration activities are proposed, inhabit a smaller population as compared to the townlands.

Some of the current economic activities taking place in the areas in and around Arandis include a mix of mining (large and small scale) and farming activities. In terms of mining the most significant activity is the Rossing Uranium. The percentage of the total of residents in Arandis of working age (15 years) and older that are unemployed is 30%, which is lower than the national percentage of 37% (NSA, 2012). However, unemployment is still a concern and this proposed mineral exploration might result in the establishment of a mine.

3.1.2. SERVICES INFRASTRUCTURE

Arandis is located along the B2 trunk road and Transnamib railway line between Okahandja and Swakop. The B2 carries large traffic volumes through Arandis and is considered to be the regional trade route. Some of the roads within the internal road network are gravel and others tarred.

Arandis is located within a water scarce environment. Nam Water supplies the area with its bulk potable water needs. The storm water flow within Arandis has been a concern in recent years according to Reiff (2014) and the Namibian Sun (2014). According to Reiff (2014) blockages exist within the storm water system within the central business district and storm water sometimes during heavy rainfall enters the sewer system. The lack of tarred roads (and associated slow storm water runoff rate) within the internal road network of Arandis is

potentially another factor contributing to flooding within the town during periods of heavy rainfall (Reiff, 2014).

3.2. CLIMATE

The Arandis is located in an arid to semi-arid region with approximately half of the district covered by dryland grasses and the other half by dryland scrub. The climate is characterised as a hot desert climate (and designated by the BWh symbol as per Köppen and Geiger climate classification).

The average annual temperature is 21.9 ºC. The lowest temperatures are typically encountered in the three-month period between June and August, with the coldest temperatures in mid-August ranging from approximately 7-10 °C. The lowest average temperatures are experienced in July (approximately 17 ºC). The highest temperatures are reported between late October and early February with January being, on average, the hottest month with an average temperature of 25.2 ºC. Peak average temperatures reach up to 32 °C (generally in mid-November).

The average annual rainfall is about 239 mm (www.en.climate-data.org/location/2187) with most falling between January and April; February experiences the most rain with an average of 71 mm. Most rainfall is associated with vigorous thunderstorms. Climatic conditions offer no impediment to exploration on the Project, with mineral exploration activities possible all year round.

3.3. FLORA

Trees / Shrubs and Grasses

Arandis is situated on the edge of the Central-Western Plains stretching from the coast to about 450 km to the east which connects the Escarpment. The escarpment divides most of the country into two general landscapes: the low lying coastal plain (which includes Arandis), and the higher inland plateau (Khomas Hochland to the east of Arandis). The elevation within Arandis varies between 1150 and 1450 metres. The study area is mainly comprised of four habitat types namely:

- Marble ridges; and
- Ephemeral river channels;

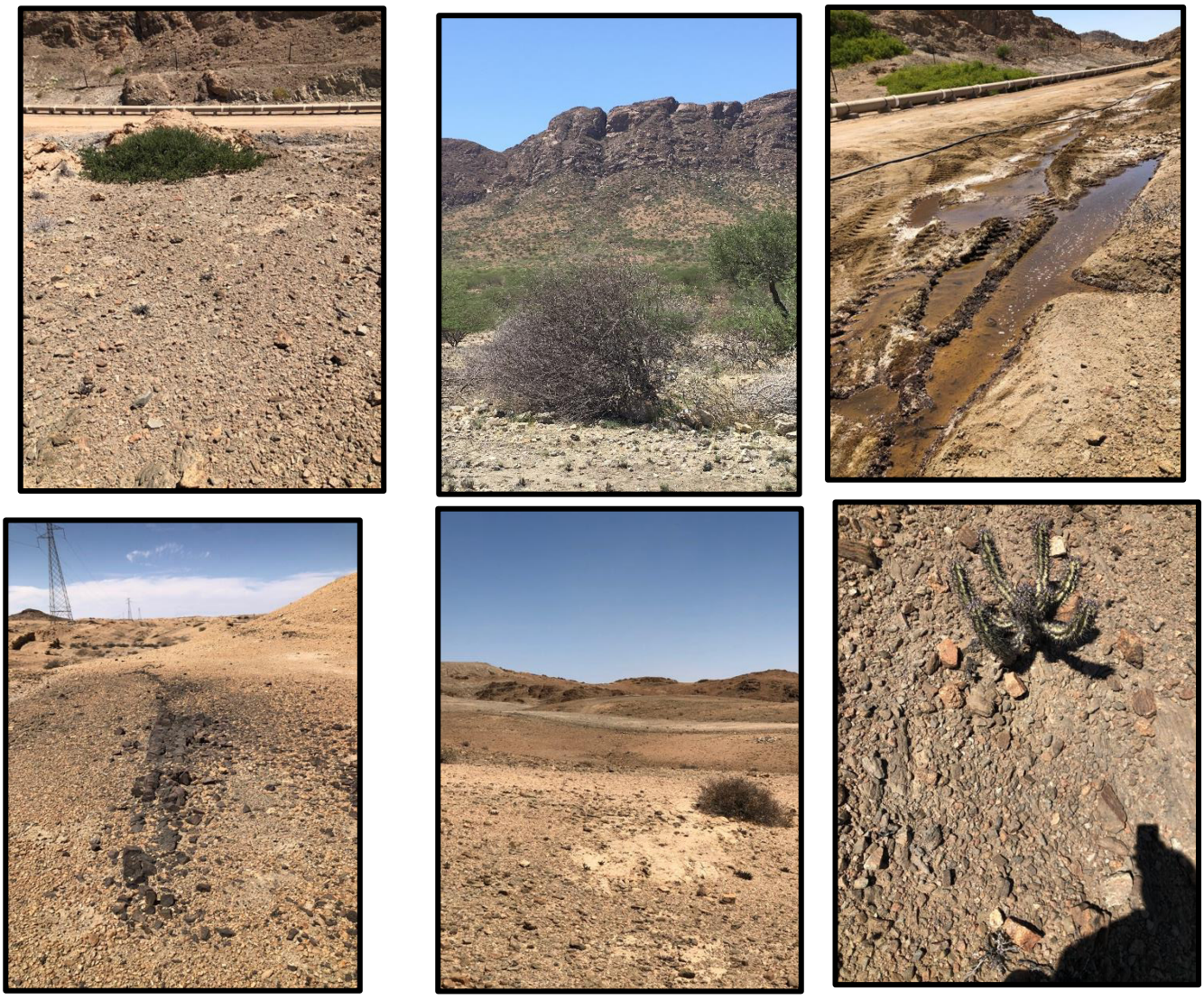


Figure 2: EPL 7986 Vegetation structure

The central desert biome was observed within EPL area, old and magnificent specimens of the welwitschia and some selected cacti (see images above) can be found. The other common plants on site are shrubs composed mainly of white thorn as illustrated on Fig 2:
The EPL 7986 is situated towards the eastern edge of the Central Namib Desert vegetation zone. This zone extends southwards to the Kuiseb River, and to the east, known as the Escarpment Zone. Even though the Central Namib Desert is considered to be a distinct vegetation zone, there is a distinctive east-west distribution pattern within this zone. This pattern is closely related to the inland distribution of coastal fog. The fog can reach as far as the Rossing Mine. However, all of the plant species found within this region are considered to be drought-tolerant, drought-resistant or succulents.

The relevant plant species are often widely dispersed. The predominant species are primarily Zygophyllum stapffi and Arthraerua leubnitzae, along with a few Hypertelis caespitose. Lichens are fairly common on the large gravel and gypsum plains. Some of the lichen species include Parmelia spp., Telochistes capensis and Usnea spp. The lichens attach themselves to small fragments of stone or gypsum flakes, with Arthraerua leubnitzae forming thick stands in shallow depressions or on slopes of low ridges. These lichen, micro fungi, green algae, and cyanobacteria surfaces are also referred to as biological soil crusts, and are important features of the desert environment. These are thin layers on the surface to a few millimetres into the ground or even under translucent stones.

These crusts are important features in the barren landscape, as it stabilises soil surfaces, and thus protect these surfaces from erosion. In addition, it contributes towards seed germination and nitrogen and carbon fixing, and acts as good biological indicators of the condition of the surrounding environment.

On site frequency of lichen was insignificant, and was mostly limited to watercourses and rocky hillsides. This is essentially due to the dust produced as a result of the mining activities.

The vegetation further inland, within water courses or river beds is distinctively denser than on the plains. Species such as Asclepias buchenaviana is fairly common, with Acacia reficiens becoming more prominent closer to the coast. Many annuals sprout following some rainfall, with the more common species being of the Stipagrostis species. Grassy plains can be found between the desert and the escarpment.

The western portion of the Escarpment Zone is characterised by species with succulent stems or leaves, whereas further east shrubs and half-shrub species are common and eventually woody species are found. Woody species are also common within the drainage lines. The episodic rivers drain from the interior plateau down towards the coast, resulting in deep channels. This has allowed for species characteristic of the escarpment to colonise areas within the Central Namib Desert which otherwise would not be feasible. Some of the species found within or along the river beds include the following woody species: Acacia erioloba, A. albida, Tamarix usneoides, Euclea pseudogenes, Ziziphus mucronate, Salvadora persica and Prosopis glandulous.

The riverine vegetation is an important feature in the landscape as is provides habitat, sustenance, and shelter for a number of game species, particularly during extended dry periods. However, the riverine vegetation is variable in terms of structure, as the intensity,

frequency and duration of rainfall determines the severity of flood periods. The floods also provide corridors for flora species to spread. Many annual species are washed down from the escarpment and colonise the river beds downstream. The lifespan of these species is limited, as they are dependent on a shallow water table.

3.3.1. HABITATS

The habitats in the EPL area can be broadly divided into three broad habitat types, namely:

- Rocky Hillsides: Least vegetated habitat due to the very shallow soils or no soil, and loose surface rocks.
- Open Plains: Features scattered bushes and shrubs due to the deeper soils. The plains are interrupted with rocky outcrops of varying sizes.
- Watercourses: More vegetation in the form of larger bushes and trees along the length of the course, due to the more frequent availability of water. Water is usually only available for short periods of time. The soil is usually sandy and loose.

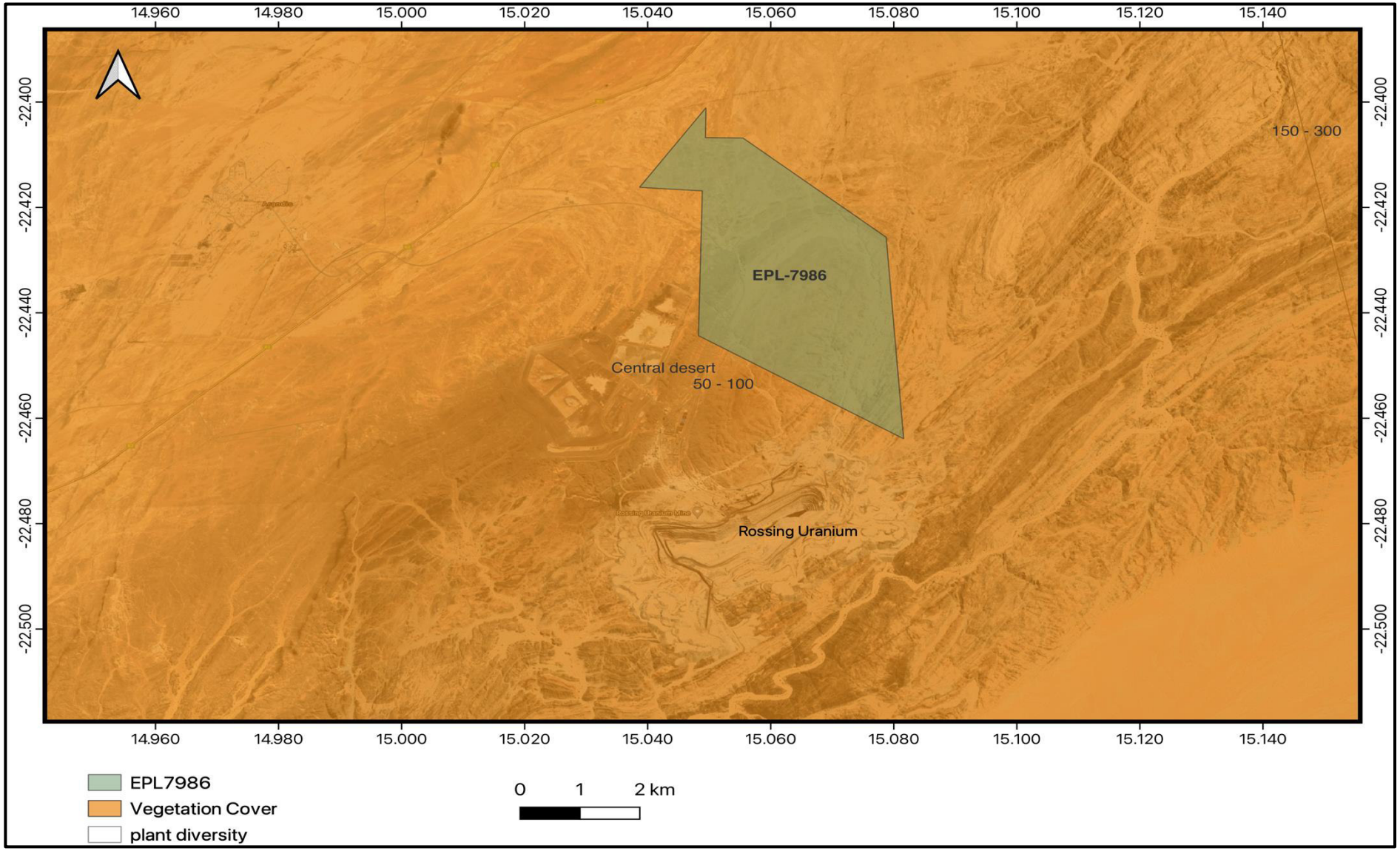


Figure 3: Vegetation structure locality map

3.4. GEOLOGY

The Project is located in the southern Central Zone (CZ) of the Damara Belt, many of the economic ore deposits (gold, base metal and pegmatite hosted rare metal deposits) of the Damara Belt occur within the Central and Northern Zones. Among these deposits are Li-Be, Sn and tourmaline-bearing Lithium Caesium Tantalite ("LCT") family pegmatites and U-bearing Niobium Yttrium Fluorine ("NYF") family pegmatitic leucogranites, which have been intruded into the tightly folded supracrustal rocks of the Damara Supergroup (Keller et al., 1999).

The Damara Belt is the northeast trending arm of the Neoproterozoic Damara Orogen which extends through central Namibia, east into Botswana and north into Angola and the Democratic Republic of Congo. The Damara Belt intersects the north-northwest sinistral transgressional trending Kaoko Belt and north-trending sinistral transgressional Gariep Belt at a triple junctions centred near Swakopmund (Ashworth, 2014). Figure 4 below, gives an overview of EPLs area geological structure.

3.5. HYDROLOGY

A reconnaissance level field assessment was conducted to confirm the current conditions in the area and to identify potential hydrologic risks associated with establishment of the proposed project. The general drainage network is dominated by small, ephemeral rivers that flow only when it rains, otherwise they are dry most of the year. The average elevation is 1,300 mml, ranging from 1,250 mml, at the lowest point on the EPL area. Arandis is situated on the edge of the Central-Western Plains stretching from the coast to about 450 km to the east which connects the Escarpment. The escarpment divides most of the country into two general landscapes: the low lying coastal plain (which includes Arandis), and the higher inland plateau (Khomas Hochland to the east of Arandis). The elevation within Arandis varies between 1150 and 1450 metres. The study area is mainly comprised of marble ridges; and Ephemeral river channels which provides for the majority of the drainage pattern in the area as illustrated on figure 5.

4. CHAPER FOUR: PUBLIC CONSULTATION

4.1. OVERVIEW

The public consultation process forms an important component of the Environmental Assessment process. It is defined in the EIA Regulations (2012), as a "*process in which potential interested and affected parties are given an opportunity to comment on, or raise issues relevant to, specific matters*" (S1). Section 21 of the Regulations details steps to be taken during a given public consultation process and these have been used in guiding our process.

Formal public participation has taken place via public consultations and focal meetings, newspaper announcements to inform the public that such a large-scale project is under consideration. The public consultation process has been guided by the requirements of Environmental Management Act (EMA) No. 7 of 2007 and the process has been conducted in terms of regulation 7(1) as well as in terms of the EMA Regulations of GN 30 of 6 February 2012 and the World Bank EIA standards and project ToR.

Its overriding goals have been to ensure transparency in decision making and to.

- ✓ Ensure stakeholder concerns are incorporated in project design and planning;
- ✓ Increase public awareness and understanding of the project and
- ✓ Enhance positive development initiatives through the direct involvement of affected people.

The objectives of the public participation are to build credibility through instilling integrity and of conducting the EIA, Educate the stakeholders on the process to be undertaken and opportunities for their involvement and build stakeholders by establishing an agreed framework accordingly. This requires accessible, fair, transparent and constructive participation at every stage of process. Inform stakeholders on the proposed project and associate issues, impacts and mitigation and using the most effective manner to disseminate information.

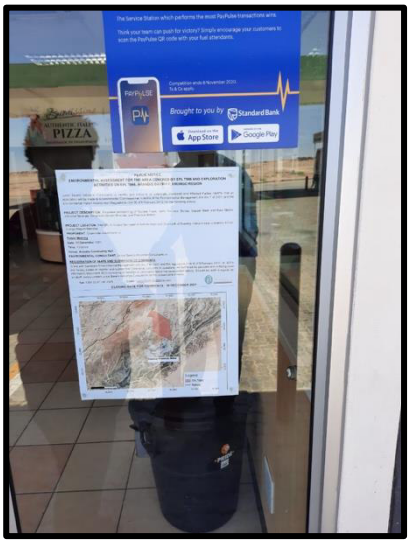
In this section of the report, the results of consultations with various classes of stakeholders are summarized. The results of consultations with other stakeholders and community members who took part in this EIA are attached as Appendices.

The consultation was facilitated through the following means:

- A Background Information Document (BID) containing brief project description, the EIA process and notice of invitation to participate. BID was shared with stakeholders and community members.
- Invitation to participate as published in the local newspapers (The Confidante and the New Era) as shown in Table 3 below and Appendix A of this document.
- Announcement of EIA process verbally in the common public meeting points.
- Placement of a public notice at the project site and Traditional Authority offices.

Table 3: Details of public notification of the EIA study

Method	Area of Distribution	Language	Date Placed
The Confidante	Country Wide	English	25/11/21, 02/12/21
Windhoek Observer	Country Wide	English	26/11/21, 03/12/21
Poster's display	Arandis Town council Main Office	English	23/11/18
	Arandis Community Hall, Usab location	English	06/12/21
	Service station and around town	English	06/12/21
Public Meeting	Arandis Town Hall	English, Afrikaans	17/12/21



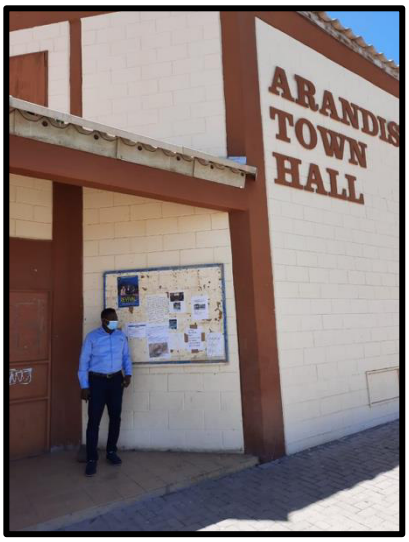


Figure 4: EIA Notices (Left-Main Town Council Offices, Right-Arandis Town Hall)

- ✓ *Key Stakeholder Engagement Meeting*

A consultative meeting was held with key stakeholders and local residents on the 17th December 2021 at Arandis Town Community Hall, in Usab location. The meeting was not well attended; however, it was undertaken. However, we did a door-to-door campaign after the meeting. A description of the project was presented and opportunity given for those present to give their comments and concerns. Those present actively engaged once the floor was open for discussion. Minutes of the meeting are given in Appendix A of this document as well the attendance register explaining the project and the EIA study. Given below are the details of the meeting which was held:

- ✓ *Identification of Interested and Affected Parties (I&APs)*

The EIA team identified and consulted the following I&APs & key stakeholders for the proposed project:

- ❖ Arandis Town Council,
- ❖ Community Members.

Other I&APs were allowed to register on a willing basis to the EIA team. A database was compiled containing their names and correspondence details. The registration was accomplished over a period of 21 working days. The public meeting was held on 17th December 2021 and detailed information on points of concern please refer to **Appendix A: 5** of this report.

- ✓ *Consultation with Stakeholders*

Experts in relevant fields, leaders of thought in environmental matters, Organs of the State local communities were consulted for their opinions on issues relating to the potential ecological and socio-economic impacts of the proposed project. This provided the opportunity for stakeholders and the public at large to engage in the process and to make comments or express their concerns regarding the proposed development.

Figure 5: Photographs of the meeting held during stakeholder consultation process and door to door consultative process around the town.

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1. OVERVIEW

Onaminda investment cc has committed itself to sustainable land development through drafting a corrective action plan for all anticipated environmental impacts associated with the project. This is also in line with the Namibian Environmental Management legislation and International best practices mineral exploration and related activities.

The proponent will implement an Environmental Management Plan (EMP) to prevent, minimise and mitigate negative impacts. The environmental management plan is being developed by Junior Baiano Industrial Consultants (JBIC) cc to address all the identified expected impacts, the plan will be monitored and updated on a continuous basis with aim for continuous improvement to addressing impacts.

5.2. IMPACT ASSESSMENT METHODOLOGY

An impact assessment matrix was used to assess all possible impacts of the project on the environment. In line with Namibia Environmental Management Act No. 7 of 2007 and the Environmental Impacts Regulations (GN 30 in GG 4878 of 6 February 2012) with the direction on impacts analysis the following impact assessment criteria was identified by the team and deemed suitable.

Table 4: Impact Screening Criteria

Aspect	Description
Nature	Focuses on the type of effect that the project will have on environmental components. Addresses questions related to “what will be affected and how?”
Extent	Spatial extend of the project and anticipated spatial extend of impacts indicating whether the impact will be within a limited area (on site where construction is to take place); local (limited to within 15km of the area); regional (limited to ~100km radius); national (extending beyond Namibia’s boarders).
Duration	This looks at the temporal issues pertaining to time frames e.g. whether the impact will be temporary (during construction only), short term (1-5 years), medium term (5-10 years), long term (longer than 10 years, but will cease after operation) or permanent.

Intensity	Establishes whether the magnitude of the impact is destructive or innocuous and whether it exceeds set standards, and is described as none (no impact); low (where natural/ social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).
Probability	Considers the likelihood of the impact occurring and is described as uncertain, improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures).
Significance	Significance is given before and after mitigation. Low if the impact will not have an influence on the decision or require to be significantly accommodated in the project design, Medium if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the route can be used, but with deviations or mitigation) High where it could have a “no-go” implication regardless of any possible mitigation (an alternative route should be used).

The application of the above criteria will be used to determine the significance of potential impacts using a combination of duration, extent, and intensity/magnitude, augmented by probability, cumulative effects, and confidence. Significance is described as follows:

Table 5: Impact Rating Criteria

Significance Rating	Criteria
Low	Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given development description. This would be allocated to impacts of any severity/ magnitude, if at a local scale/ extent and of temporary duration/time.
Moderate	Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term.
High	Where the impact could have a significant influence on the environment and, in the event of a negative impact the activity(ies) causing it, should not be permitted (i.e. there could be a ‘no-go’ implication for the development, regardless of any possible mitigation). This would be allocated to impacts of high magnitude, locally for longer than a month, and/or of high magnitude regionally and beyond.

5.3. IMPACT ASSESSMENT

By subjecting each of the potential impacts to the matrix above, the EIA team established the significance of each impact prior to implementing mitigation measures and then after mitigation measures have been implemented. Some of the mitigation measures are mentioned but detailed descriptions of management actions are contained in the accompanying EMP.

Table 6: Environmental impact assessment matrix for the proposed Onaminda Investment Resources Exploration activities

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
TOPOGRAPHY	Topography and Landscape	Alternation of existing topography	Operation	Short term	Low	Local	Direct	Probable	Low
	Topography and Landscape	Topographic changes and Visual Impact from overburden material.	Operation	Medium term	Moderate	Local	Direct	probable	Moderate
SOILS	Soil	Loss of usable topsoil material	Operation	Long term	Low	Local	Direct	Highly probable	Moderate
	Soil	Contamination to soil from waste disposal	Operation	Long term	Moderate	Local	Direct	Improbable	Low
LAND CAPABILITY	Socio Economic Activities	Land utilisation for the benefit of the people	Operation	Long term	High	National	Indirect	Probable	Moderate
	Terrestrial ecology and biodiversity	Decreased in vegetated land (biodiversity zones) within the Exploration zones	Operation	Long term	Low	Local	Direct	probable	Low

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
	Groundwater quality	Groundwater source and soil may be polluted vehicular movements, mineral exploration drilling, etc.	Operation	Short term	High	Local	Direct	probable	Moderate
	Surface water quality	Increased sediment load from exposed surfaces	Operation	Short term	Low	Local	Direct	Probable	Moderate
	Surface water quality	Stormwater generation from, the large open surface area may create stormwater which may result in pollution.	Operation	Long term	High	Local	Direct	Highly Probable	Moderate
	Surface water quality	Increase in surface water run- off from a large open surface area on site because of vegetation removal	Operation	Short term	Moderate	Local	Direct	Improbable	Low
AIR QUALITY	Air Quality	Generation of dust during drilling and camp site construction.	Construction, operation	Short term	Low	Local	Direct	Probable	Moderate
	Noise Pollution	Generation of dust during drilling and camp site construction..	Construction and operation	Long term (operation)	Low	local	Direct	Probable	Low
	Topography and Landscape	Visual impacts due to use of unsustainable disposal methods	Construction and Operations	Long term	Low	Local	Direct	Probable	Moderate

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
	Terrestrial ecology and biodiversity	Loss of habitat, and clear or damage to vegetation	Construction and Operations	Long term	Moderate	Local	Direct	Probable	Low
FAUNA	Terrestrial ecology and biodiversity	Loss of habitat and clearing or damage to vegetation	Construction, Operation	Short Time	Moderate	Local	Direct	Highly Probable	High
FLORA	Terrestrial ecology and biodiversity	Proliferation of invasive species Establishment of bush encroachers in disturbed areas.	Construction and Operations	Long Term	Low	Local	Direct	Probable	Low
	Terrestrial ecology and biodiversity	Illegal collection of firewood	Construction and Operations	Long Term	Low	Local	Direct	Probable	Low
	Terrestrial ecology and biodiversity	Clearing of land may lead to destruction of protected vegetation and loss of biodiversity. Loss of mature and protected tree species due to clearing of land for parking space.	Construction	Short Term	Moderate	Local	Direct	Highly Probable	Moderate
	Terrestrial ecology and biodiversity	Uncontrolled/accidental fires	Construction and Operations	Long Term	High	Local	Direct	Probable	Moderate
Socio-economic	Socio Economic Activities	Temporary employment prospects in the area	Construction	Short Term	Low	Local	Direct	Probable	Moderate Positive

Environmental Impact	Element	Impact	Phase	Duration	Magnitude	Extent	Type	Probability	Significance
	Socio Economic Activities	Security concerns due to increased number of persons in areas	Construction and Operations	Long	High	Local	Direct	Probable	Moderate Positive
	Socio Economic Activities	Job creation construction workforce	Construction and operations	Long term	High	Local	Direct	Highly Probable	Moderate Positive
	Socio Economic Activities	Job creation permanent workforce	Operations and constructions	Long term	Moderate	Local	Direct	Probable	Moderate Positive
	Contributing to the National economy	Improved transport infrastructure and services	Operations	Long Term	Moderate	National	Direct	Highly Probable	High Positive
	Contribution to Local Economy	Employment and local procurement.	Construction and Operations	Long Term	Moderate	Local	Direct	Probable	Moderate Positive

5.4. RISK ANALYSIS

Based on the impacts identified by this study during site visit, process analysis, desk study and stakeholder consultations conducted, an integrated environmental risk analysis was carried out using the DEFRA Guidelines for Environmental Risk Assessment and Management 'Green Leaves III' (latest edition) as well as the international Procedures for best practices. The risk analysis shows that the project will have some negative impacts on the environment (Biophysical, economic, social and political), it has been also noted that the project will deliver some positive impacts on the receiving environment, as well as on social and economic aspects. In order to prevent or mitigate negative impacts and to increase positive impacts a coordinated project management strategy will be put in place taking into cognisance environmental issues associated with the project implementation.

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Appendix A: Public Consultation Documents

1. Background Information Document
2. Newspaper Adverts
3. Site Notice
4. Meeting Attendance Register
5. Meeting Minutes
6. Questionnaires

Appendix B: Site Information

1. Locality Map

Appendix C: Consultancy Team resumes