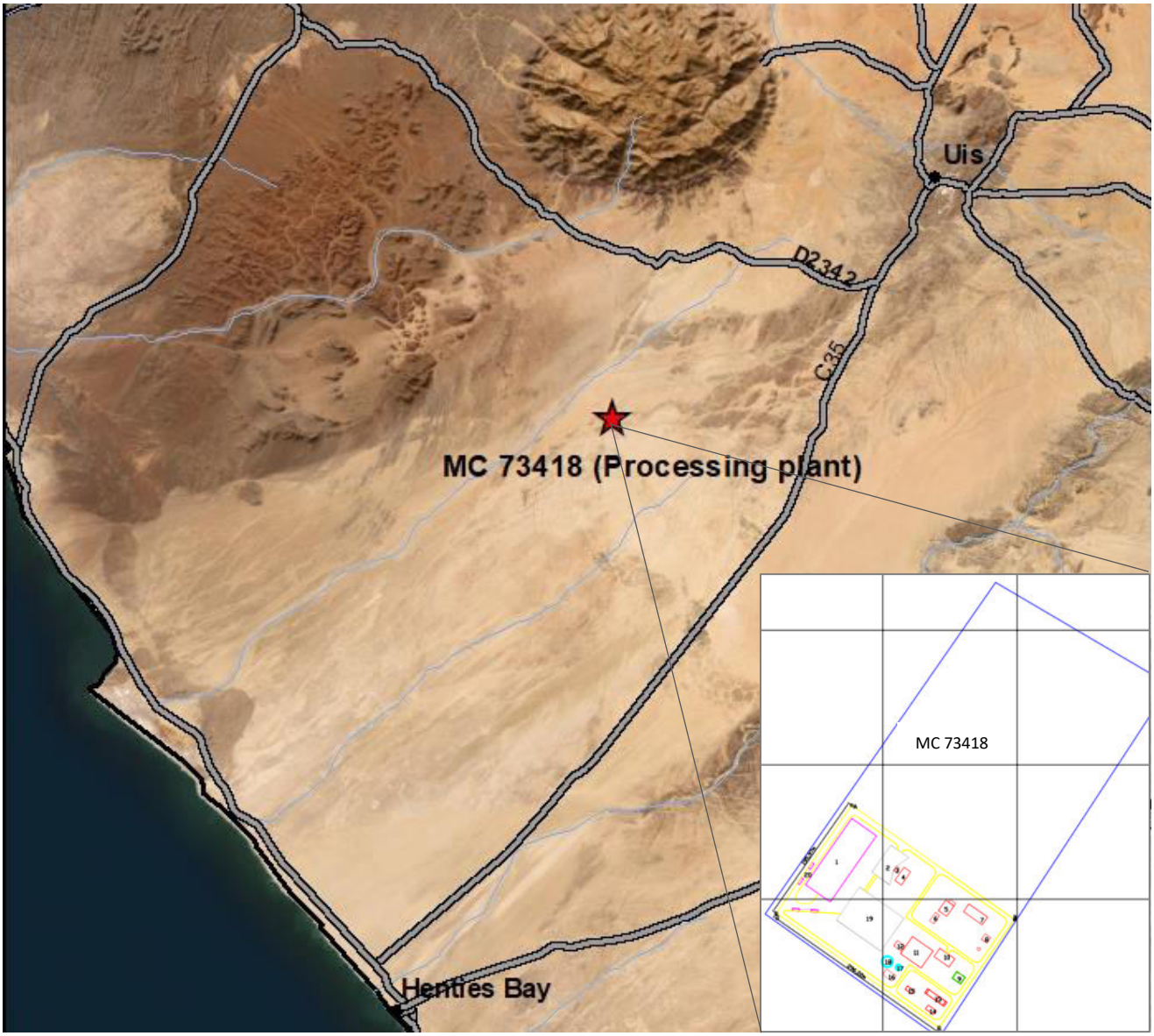
ENVIROMENTAL IMPACT ASSESSMENT (EIA) FOR THE PROPOSED ESTABLISHMENT AND OPERATION OF A LITHIUM PROCESSING PLANT ON MINING CLAIM 73418, DAURES CONSTITUENCY, ERONGO REGION

Proponent: Long Fire Investment (Pty) Ltd



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EXECUTIVE SUMMARY

The demand for renewable energy storage systems, especially lithium-ion batteries, has seen significant growth in recent years and a number of lithium producing countries such as Namibia has taken a stance aimed at ensuring that the resources such as lithium are not exported in their raw form. This venture will ensure that the Namibia is in a better position to benefit economically from the global demand for the essential battery material. The Long Fire Investments' Lithium Processing Plant aims to contribute to meeting this undertaking by processing lithium-bearing ores to produce 5% lithium concentrate, which will be a crucial raw material for various technological breakthroughs.

Long Fire Investment (Pty) Ltd, holds mineral rights over ten (10) mining claims MCs (73409 - 73418) to mine base and rare metals, dimension stone, industrial minerals, non-nuclear fuels, and precious metals. The proposed processing plant to be constructed on mining claim 73418 will be processing lithium. The processing plant will be located in Erongo Region, approximately 50 km SW of Uis settlement, Dâures constituency, in western central Namibia. Lithium to be sourced from mining claims 73409 – 73418.

In terms of processing capacity, the plant will be processing 1 million tons of ore per year. The project has a service life of 15 years and the mineral to be processed being spodumene with the final product being lithium concentrate with a grade of 5%. Water will be sourced from the desalination plant at Henties Bay, Uis settlement as well as boreholes that will be drilled. approximately 8000m^3 will be required per day (domestic consumption included). The power source will be will diesel generators. The construction of the facility will last roughly 18 months and the facility will include raw ore storage yard, crushing and screening, crushing product storage yard, heavy medium separation, product storage yard, weighbridge sites, crusher site, conveyor belts areas, as well as supporting production auxiliary facilities such as laboratories, machine repair rooms, diesel generator rooms, water intake pump rooms and living camps.

The activities of the proposed project fall under some of those listed in the Environmental Management Act, 2007 (Act No. 7 of 2007) and Environmental Regulations procedure (GN 30 of 2012) that cannot be undertaken without an Environmental Clearance Certificate (ECC). In order to obtain an Environmental Clearance Certificate for the proposed activities, the proponent is required to have undertaken an Environmental Impact Assessment (EIA) study and Environmental Management Plan (EMP). As such, an environmental clearance certificate must be applied for in accordance with regulation 6 of the 2012 environmental regulations and it is on these grounds that this Environmental Impact Assessment is being conducted.

The economic benefits of this proposed project to Namibia cannot be overemphasized, both direct and indirect through taxes, royalties, employment creation and socio-economic development. Potential positive and negative impacts of the proposed project were identified, assessed, and mitigation measures are provided in the EMP. These mitigation measures and recommendations provided in this EIA and EMP are deemed sufficient to minimize the identified impacts to acceptable levels. The project area is not pristine, it already hosts other industrial magnitude activities such as such as Uis tin mining and processing activities at Uis settlement, 50 km to the north east, therefore the natural setting of the area is accustomed to similar industrial operations and that potential negative impacts of the proposed project on the natural environment of the surrounding area will be negligible. It is hereby recommended that proposed lithium processing on the mining claim (MC) 73418 be granted an Environmental Clearance Certificate, provided that: All mitigations provided in this report are implemented as stipulated and where required and emphasized, improvement should be effectively put in place.

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1. Introduction

1.1 Background

The demand for renewable energy storage systems, especially lithium-ion batteries, has seen significant growth in recent years and a number of lithium producing countries such as Namibia has taken a stance aimed at ensuring that the resources such as lithium are not exported in their raw form. This position will ensure that the country captures more profits from the global demand for the essential battery material. The Long Fire's Lithium processing plant aims at contributing to meeting this undertaking by processing lithium-bearing ores to produce 5% lithium concentrate, which will be a crucial raw material for renewal energy storage systems and various technological breakthroughs. Lithium is to be sourced from mining claims 73409 – 73418 and spodumene is the main lithium mineral envisaged for processing. These mining claims are located within the Cape-Cross-Uis pegmatite belt, which consists of a wide range of syn-, late- and post-tectonic granites and pegmatites that are Pan African age, which has been found to host minerals of economic value such as lithium, tin, tantalum, tungsten and REE.

The establishment of this project is required in terms of the country's environmental legislation to conduct an environmental impact assessment and prepare an environmental management plan that will assess and save as a mitigation plan to potential environmental impact of the project. Thus the issuance of an Environmental Clearance Certificate by the Ministry of Environment, Forestry and Tourism (MEFT) will pave way for this envisaged mineral processing activity. The EIA is aimed at ensuring that at all potential impacts on the Environment are taken into consideration and mitigation measures to avoid or minimize these impacts are put in place.

1.2 Project Description

The proposed processing plant will be situated in Daures constituency, Erongo Region, 50 km SW of the settlement of Uis and will be operated by Long Fire Investments (Pty) Ltd). The facility will comprise several components, including an ore receiving and pre-processing unit, beneficiation

unit, drying and concentrate handling facilities, storage and supporting infrastructure. The processing plant will process 1 million tons of ore per year and the project will has a service life of 15 years with the initial main mineral to be processed as spodumene. The envisaged end product of the plant will be a lithium concentrate with a grade of 5%. With regard to water requirement will need approximately 8000m^3 will be required per day (domestic consumption included) and water will be sourced from the desalination plant at Henties bay, Uis settlement as well as boreholes that will be drilled in the proximity of the project. As with any industrial project, power is an important main stream requirement and considering the moderate size of the project, diesel generators have been decided on as the viable option in consideration of economical and time aspects. As afore stated in the earlier pages herein, lithium will be sourced from mining claims 73409 – 73418 on which lithium bearing pegmatites have been delineated during exploration. The defined mineral resource on these mining claims have been found to contain sufficient ore to satisfy the envisaged minimum amount of ore required by the processing plant.

The facility will include: raw ore storage yard, crushing and screening, crushing product storage yard, heavy medium separation, product storage yard, weighbridge sites, crusher site, conveyor belts areas, supporting production auxiliary facilities such as: laboratories, machine repair rooms, diesel generator rooms, water intake pump rooms and residential camps. The construction of the facility will take approximately 18 months to complete.

1.3 An overview of the processing plant

The one (1) million tons/year heavy medium mineral processing project will mainly include: Concentrator raw ore storage yard, crushing and screening, crushed product storage yard, heavy medium separation, product storage yard and other main industrial facilities, laboratory, dressing plant machine repair workshop, diesel generator room, water intake pump room, living dormitory and canteen and other supporting facilities Low-voltage power distribution, electrical transmission, automatic control, electrical lighting, electrical safety, etc. of production auxiliary facilities. The total amount of earthwork works on the site is 273,000 m³, including 65,000 m³ of excavation and 20.8 m³ of filling.

Identified stake holders

- Traditional authority,
- Tsiseb Conservancy,
- Interested and affected Parties

1.3.1 Objectives of the public consultation

Summarize the objectives of the meeting:

- To provide an overview of the Environmental Impact Assessment (EIA) and Public Participation Process;
- To provide stakeholders / I&APs with information regarding the proposed project;
- To afford stakeholders and I&APs an opportunity to give input on the project;
- To gather public comments raised for inclusion in the EIA Report and decision-making process;
- To make sure that all potential impacts on the Environment are taken into consideration;
- To provide the competent authority with the necessary information which will allow them to make informed decisions;
- To obtain information that may influence the design project.

1.3.2 Key points of the proposed project

- Location: on MC 73418
- Capacity: 1 million of ore t/a
- The project has a service life of 15 years
- Target mineral: spodumene
- Final product: lithium concentrate
- Concentrate grade: 5%

- Water source: 40 boreholes to be drilled (16250m^3/d).
- Power:
    1. 10 kV diesel generator set
    2. The oil depot is equipped with 4 horizontal oil tanks of 50m³, which are arranged in the open air.
    3. The oil tank is provided with a concrete foundation with a height of 500mm.

Two phases:

- Construction of the plant (18 month)
- Operation of the plant (12 years lifespan)

Source of lithium

- Lithium to be sourced from mining claims 73409 – 73418

1.3.3 Processing process

Processing process will involve:

- Crushing to ore 0.5-8mm
- Grinding
- Classification
- Heavy medium separation (HMS) to produce a concentrate
- Re-crushing & re-separation of middlings
- Magnetic separation
- Fine ore flotation
- Fine ore dehydration

1.3.4 Main Potential Impacts

Potential impacts during construction and operational phases:

- Biodiversity (dust, noise),
- Air quality (Exhaust gas, raw ore, concentrate transportation, crushing and screening unloading),
- Noise (crusher, heavy duty vehicles) and socio-economic (96 employees, entrepreneurial opportunities, boost local businesses),
- Waste (waste engine oil, tailings & magnetic water, wastewater),
- Visual impacts (loss of existing land cover and changes in landscape views),
- Archaeology (No artefacts within the project area, NHC report was completed),
- Potable water usage
- Ground water obstruction

The potential impacts will be assessed and where necessary measures will be put in place to ensure that they avoided / minimized, where possible. Environmental protection budget has been forms part of the investment.

Wastes:

- Exhaust gas & dust
    - ✓ Dust will be generated at the unloading points of crushing and screening workshops, crushed product storage yards, powder ore storage yards, and tailings storage yards: the dust concentration will be 1-2g/m^3
    - ✓ Dry fog dust suppression measures suppression efficiency of ≥ 95% will be put in place, at various dust producing points such as crushing and screening workshops, product storage yards and silos, and discharge points at the head and tail of belt conveyors.

- ✓ The TSP (total suspended Particles) hourly concentration meets the requirement of 1.0mg/m^3 fugitive emission limit of particulates in the "Integrated Emission Standard of Air Pollutants" (GB16297-1996).
- ✓ regular watering of production sites and transportation routes will effectively reduce dust generation

- Solid waste
  - ✓ The project will process 1000kt/a of ore, which adopts a single dense medium separation process to produce spodumene concentrate with a Li_2O grade of 5%.
  - ✓ The tailings output will be 1944 t/d (dry ore) with the is controlled moisture content of 20%.
  - ✓ Tailings will dumped at the tailing site after dehydration - dry tailings
  - ✓ Tailings stockpile will be located 500m south of the plant,
  - ✓ The tailing stockpile area is 98,950 square meters, the stacking height is 20m, the height of each layer is 10m,
  - ✓ The stacking slope ratio is 1:2, the platform width is 20m,
  - ✓ The design volume is 1.325 million m^3, which can meet the tailing stockpiling demand of 1.132 million m^3 for three years.
- Waste liquid
  - ✓ Thickener overflow water, dense overflow water, and filter press water & magnetic tail water will be collected and pumped back to the concentrator for reuse), 86.15% will recycled,
  - ✓ domestic waste water to be treated treatment and used for greening)
- Sewage water
  - ✓ will be treated and used on roads to suppress dust and irrigating the premises
- Noise

- ✓ The noise in the workplace should not exceed 90dB(A)
- ✓ Production equipment for mineral processing, will produce the noise level of about 80-110dB(A).
- ✓ The plant's design adopts measures such as selecting low-noise equipment, setting up soundproof rooms (machine room sound insulation and sound absorption measures) and wearing protective equipment for staff to eliminate noise hazards,
- ✓ After taking noise prevention and control measures, the noise value of high-noise equipment in the workshop can be reduced to below 85dB(A), and
- ✓ the noise at the factory boundary can reach the Class 2 standard of the "Environmental Noise Emission Standards for Industrial Enterprise Boundary" (GB12348-2

- Visual impact
  - ✓ The combination of different plant species is an important means of creating a green landscape.
  - ✓ To shape the green landscape, different species and corresponding planting methods should be selected to form rich visual effects while strengthening the spatial enclosure relationship.
  - ✓ Large areas of lawns can be artificially sloped to avoid monotony, or planted with flowers as embellishments.
  - ✓ Arbors are planted on both sides of the road to divide the space and guide the direction.
  - ✓ Properly plant isolated trees to embellish the environment to achieve the purpose of plant
  - ✓ Implement effective dust control measures to reduce airborne dust and debris, maintaining clear views and reducing visual disturbances.

- ✓ Use minimum and informative signage to avoid visual clutter and maintain a clean aesthetic.
- ✓ Consider the appearance of temporary structures, such as fences and barriers, and use materials and colors that complement the surroundings.
- ✓ Properly manage nighttime lighting to minimize light pollution and glare that may impact the nocturnal visual experience.
- ✓ Minimize topsoil disturbance, preserve existing trees, and add native plants to encourage re-vegetation.
- ✓ As part of the restoration procedure, overburden will be reinserted into the excavation.
- ✓ Keep off-road equipment and vehicles inside the approved area

1.3.5 Way forward /Process that follows

- Finalize the EIA draft Report,
- Specialist studies to be undertaken,
- submit the EIA to the Ministry of Environment and Tourism where public comments will be welcomed for 14 days,
- submit the Final EIA report

1.4 Project Objectives

The main objectives of the project can be summarized as follows: To process lithium-bearing ores efficiently to produce 5% lithium concentrate, to adhere to the environmental standards and comply with the environmental management plan (EMP) as well as employ sustainable practices throughout the project's life cycle, to continually engage stakeholders and address their concerns

with the aim of forging positive relationships with the local community that will be mutually beneficial to both parties.

1.5 Terms of Reference

Upon being appointed by the proponent to conduct the Environmental Impact Assessment (EIA) for the proposed mineral processing activity, the environmental practitioner undertook a fact finding field trip to the proposed project site and the surrounding areas on the 13th of May 2023. This assessment study was carried out in accordance with the Environmental Management Act (No. 7 of 2007) and Environmental Regulations of 2012. The final report of the study is a guiding document which indicates the description of the environment that may be affected by the proposed activities, the manner in which the activity may affect the environment as well as the extent to which the potential environmental damage may occur. The assessment of the potential environmental damage to the environment was achieved following the process given below and a generalized representation of an EIA process is given in Fig. 1:

- Legal framework and policy review; aimed at identifying all legislation and guidelines that have reference to the proposed project.
- Assessment of the existing environmental (both bio-physical & socio-economic) conditions of the area.
- Stakeholder (Interested and Affected Parties) engagement for purposes of creating awareness as affording the Interested and Affected Parties with a reasonable opportunity to participate during the assessment process.
- Deliberation on the potential (both bio-physical and socio-economic) impacts of the development as well assessment of the significance of the identified impacts.
- Documentation of comments, opinions, concerns and questions raised by I&APs and stakeholders.

- Provision of a high level of environmental and social impact assessment on feasible alternatives that were taken into consideration.
- Defining the need and desirability of the activity and proposal of alternative measures where it is noticed that adverse effects may occur.
- Drafting of management and mitigation measures in an Environmental Management Plan (EMP) aimed at mitigating potentially negative impacts.
- Submission of the final assessment report to the competent authority and the Environmental Commissioner.

1.6 The Assessment Report's goal

The report of assessment is being written for the Environmental Impact Assessment of the proposed lithium processing facility to be sited on mining claim 73418. This report's main goal is to offer details regarding the proposed processing activity and to list any environmental considerations and potential effects that were found throughout the screening and assessment processes. A crucial phase in the creation of an EIA for the proposed activity is environmental assessment. The terms of reference for the formulation of an EIA will be put in place as the Ministry of Environment, Forestry, and Tourism's guidelines. This evaluation report's objective is to:

- List any significant environmental concerns that should be taken into account prior to the start of construction, and subsequently operation on the proposed site.
- To acquire the data needed for decision-making.
- To determine the EIA study's proper temporal and spatial boundaries.

Taking the above into consideration, the following are the main goals of this assessment study:

- Specify viable opposition to the proposal that is logical and workable.
- Make the general public aware of the planned exploratory operations.
- To determine the parameters for an EIA investigation.

- Identify the key stakeholders and take into account their feedback and issues.

The assessment study gives a detailed account of the environment that the activity might have an impact on as well as how that impact might manifest itself. The following strategies have been used to gather information on the receiving environment and its social surroundings: Site visits to gather first-hand information; legal and policy analysis; gathering of information regarding comparable developments and issues; discussions, meetings, and site visits with authorities; opinions and concerns expressed by I&APs and stakeholders; and qualified opinions from professional studies. The attached EMP and this report, which take into account the aforementioned, will give MEFT enough information to allow it to make an informed decision regarding the proposed mineral processing activity and whether or not an environmental clearance certificate can be issued. Fig. 1 provides a schematic illustration of the Namibian EIA procedure.

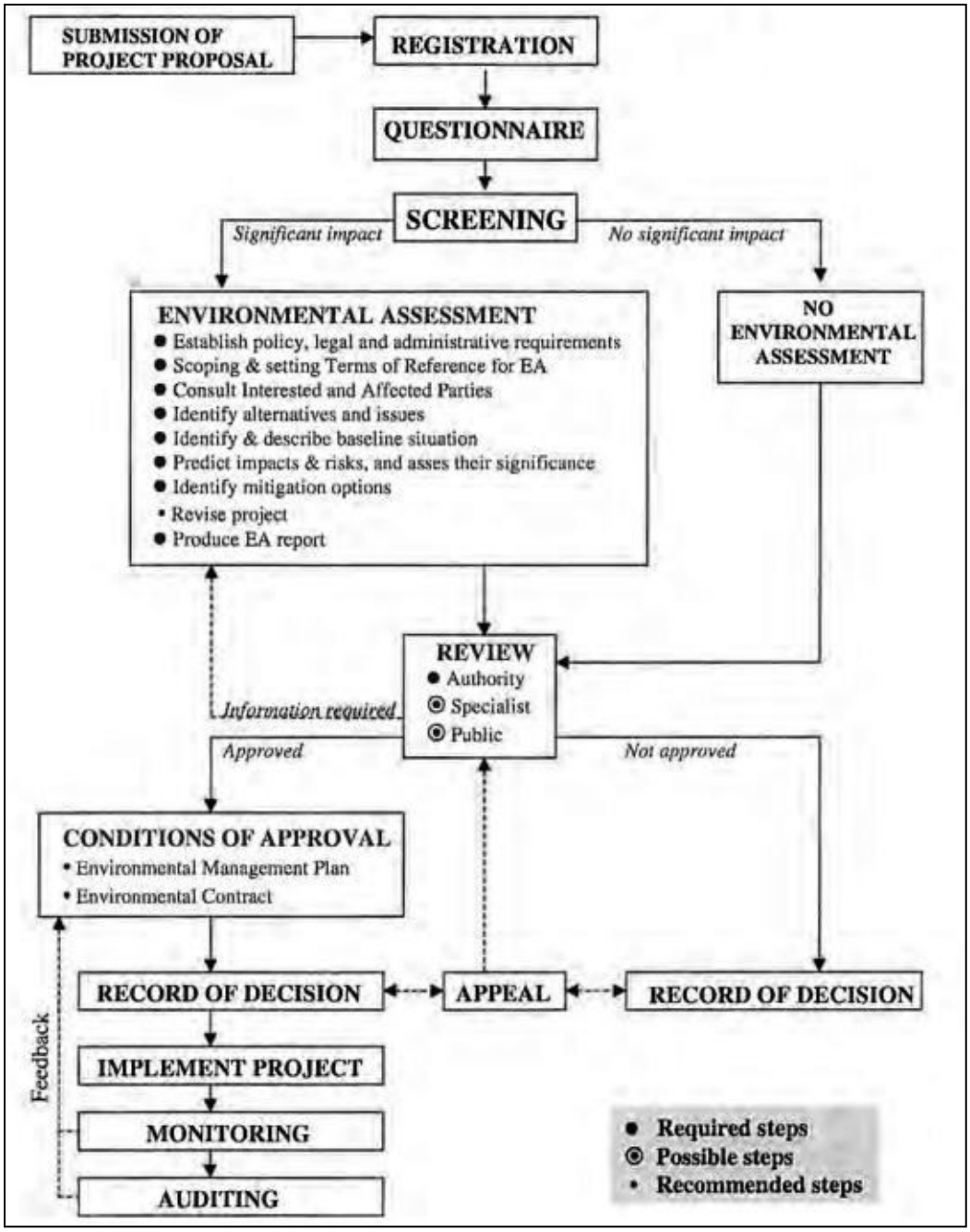

Fig. 1. Generalized schematic representation of the Environmental Impact Assessment process in Namibia (SELH, 2012).

2. Project Location and Site Selection

2.1 Site Selection Criteria

The site selection process took into consideration various aspects, including proximity to lithium deposits, availability of infrastructure, environmental sensitivity, and social considerations. Lithium ore is to be sourced from within a distance of 7 km which minimizes environmental damages associated with transporting ore for long distances. Proximity to local communities translates into social benefits such as employment creation and availability of entrepreneurial tender services to settlements proximal to the project. The selected site has very limited fauna and flora support in a way that the environment can be defined as very dry with very little wild life support.

2.2 Project location and justification for the selected site

The processing plant will be located in Erongo Region, approximately 50 km SW of Uis settlement, Dâures constituency, via C35 and D2342 from Uis in western central Namibia. From Windhoek Project site is accessed via the tarred B1 highway to Okahandja, then B2 bitumen highway from Okahandja westwards to Karibib, and the C36 main road northwards to Omaruru. From Omaruru westwards to Uis settlement, the C36 is a gravel road. The distance by road from Windhoek to Uis is approximately 330 km. From Walvis Bay, access is via the B2 tarred highway northwards to Swakopmund, the main C34 salt road north along the coast to Henties Bay, and then the gravel main C35 road northeast to Uis settlement. The processing plant will be situated within mining claim 73418. The project area covers state land gazetted as the Tsiseb Conservancy. The GPS coordinates of the processing plant are -21.473897°, 14.534153°. The chosen site is not pristine as earth scars from previous small scale mining are a common scene within the surrounding area and a mineral processing plant exists 50km to the NE of the project site at the settlement of Uis. The lithium ore to be sourced from mining claims 73409 – 73418 and other mining claims proximal to the project. The selected site was deemed suitable due to its proximity to the lithium deposits, existing infrastructure (i.e. water source), and its potential for minimal ecological disruption compared to other available locations (limited ecological support). GPS

coordinates demarcating the boundary of Mining claim 73148 are given in Table 1 and the map indicating the location of the proposed project site is given in Fig.3.

Table 1: Coordinates demarcating the boundary of the MC 73418 where the processing plant will be built.

MC 73418	**Latitude**	**Longitude**
	21° 28' 36.68" S	14° 32' 01.05" E
	21° 28' 31.06" S	14° 31' 52.59" E
	21° 28' 15.38" S	14° 32' 04.42" E
	21° 28' 20.15" S	14° 32' 13.31" E
	Size of the mining claim	**17.898 hectares**

2.3 Processing flow sheet

During the processing, various techniques such as crushing, grinding, gravity and magnetic separation as well as flotation are employed to refine the ore and prepare it for further processing (Fig. 2). The first step involves physical processing, where the valuable lithium minerals are separated from the less valuable gangue minerals through crushing and grinding for mineral liberation. Gravity and froth flotation processes are then utilized to effectively separate these minerals.

One interesting fact is that lithium minerals have a higher specific gravity compared to other minerals found in the pegmatite, like quartz and feldspar. This property enables the use of gravity concentration methods, which allows us to produce a concentrate with more than 5% of Li_2O from ore with an initial Li_2O content of only 1-1.5%. It's like discovering hidden treasures within the rock!

After obtaining the concentrate, a simple screening operation on the crushed ore further enhances the lithium grade of spodumene, another valuable mineral. Subsequently, froth flotation is applied to create a final enriched concentrate. It's like a step-by-step process, with each stage building upon the previous one to achieve optimal results.

The conversion of spodumene concentrates into lithium carbonate and/or lithium hydroxide will take place in China. This final stage transforms our concentrates into valuable products that play essential roles in various industries, such as batteries for electric vehicles or energy storage. It's

truly fascinating to see how this entire process comes together to create something so vital for modern technology and clean energy solutions.

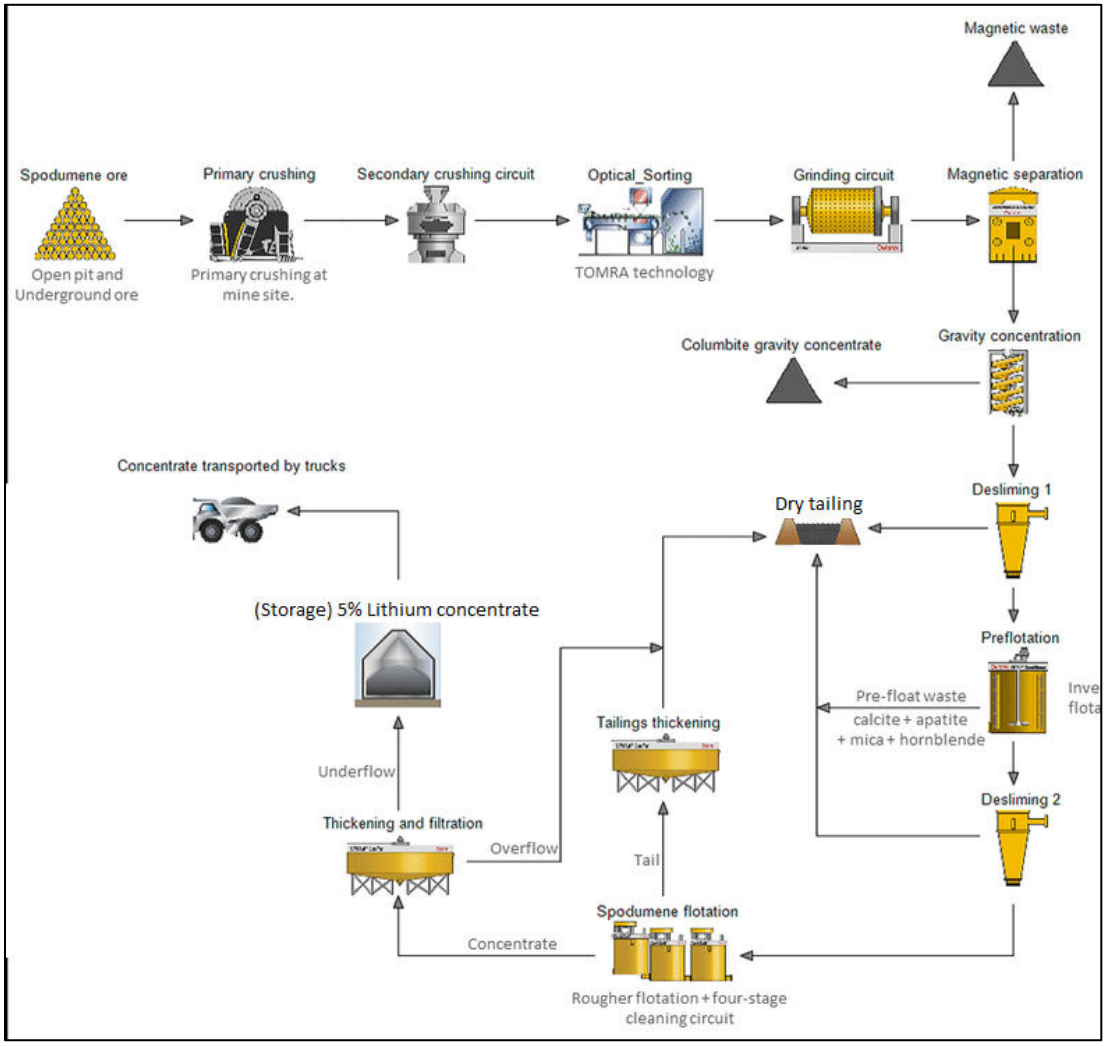

Fig. 2. Simplified flow sheet for spodumene production of a lithium concentrate (modified from Keliber 2018).

Fig. 3. Location of the proposed project area southwest of the settlement of Uis in Daures Constituency.

3. Relevant legislation

The regulatory framework relevant to the proposed project is described in this chapter. The Ministry of Mines and Energy (MME) oversees all mineral rights in Namibia, while the Ministry of Environment, Forestry and Tourism (MEFT) oversees environmental legislation. A list of

relevant laws and their applicability to the project is provided below. To increase the value of its mineral resources, the Namibian government imposed a restriction on the export of raw lithium, cobalt, manganese, graphite, and rare earth minerals on June 8, 2023.

3.1 Constitution of the Republic of Namibia, 1990

The Constitution, which guarantees a number of fundamental rights and freedoms, is the highest law of Namibia and provides for the establishment of the primary governmental bodies. Article 95 of Chapter 11—which is titled "Promotion of the Welfare of the People"—contains provisions pertaining to the environment. The Republic of Namibia shall, according to this article, "actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at maintenance of ecosystems, essential ecological processes, and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for all Namibians, both present and future.

By making available the required provisions, such as the ability to practice any profession or carry on any occupation, trade, or business in the nation, the project will enable the full execution of the right to do so. The envisaged mineral processing operations will guarantee conformance to the constitution in terms of environmental management and sustainability by putting the environmental management plan into practice.

3.2 Environmental Management Act of 2007

Lead Ministry: Ministry of Environment, Forestry and Tourism

A number of activities are prohibited by the regulations that go along with this Act from being carried out without an environmental clearance certificate issued in accordance with the Act. The EIA process ought to be informed by and guided by this Act and its rules. The project's proponent will make sure that all of the EMP's guidelines for mineral processing project are followed and that independent specialists regularly audit the project's environmental compliance. The law further stipulates that a clearance certificate must be provided ahead of the start of such activities and must be valid for three (3) years. If after the said period the proponent withes to continue with

the operations, they are required to apply for a renewal of the certificate to get another 3 years permit in line with the environmental Management Act.

3.3 The Minerals Prospecting and Mining Act of 1992

Lead Ministry: Ministry of Mines and Energy

Mineral rights in regard to exploration, reconnaissance, prospecting, small-scale mining, mineral exploration, large-scale mining, mineral processing, exports of ore minerals and transfers of mineral licenses are governed by the Minerals Prospecting and Mining Act No.33 of 1992. Prior to exporting minerals out of the country, every exporter of material of mineral origin must get an export permit from the Ministry of Mines and Energy as per the Minerals Act.

3.4 Water Resources Management Act of 2013

Lead Ministry: Ministry of Agriculture, Water and Land Reform

The act covers extraneous water resources subjects as well as the management, protection, development, use, and conservation of water resources. It also covers the regulation and oversight of water resources. Any project whose activities have potential to affect water resources are to ensure that there is compliance with regard to this Act.

3.5 Nature conservation ordinance, ordinance No. 4 of 1975

Lead Ministry: Ministry of Environment, Forestry and Tourism

The Nature Ordinance 4 of 1975 addresses game parks and nature reserves, problem animals, fish, and the preservation of native vegetation in addition to the hunting and protection of wild animals (including reptiles and wild birds). Additionally, it provides inland fisheries for nature protection and the preservation of game and other wild creatures for hunting. The ordinance also governs game dealers, game skins, protected plants, caged birds, trophy hunting of huntable game, nighttime hunting, exporting game and game meat, seabirds, private game parks, nature reserves,

rules governing wildlife associations, and coyote getter registration. Any operations that may operate in wild life zones are as per this Act required to adhere to the provisions of this Ordinance.

3.6 National Heritage Act, 2004 (Act No. 27 of 2004)

Lead Organization: National Heritage Council

The National Heritage Act establishes a National Heritage Council, a National Heritage Register, and ancillary provisions in addition to providing for the protection, conservation, and registration of places and objects with significant historical value.

The Act's requirements have been taken into account and incorporated into the EMP because there may be a chance that heritage artefacts may be discovered on the site. The National Heritage Council must be notified of any archaeological discoveries made by exploration companies pursuant to Section 55 before the find can be disturbed. When historic places are found, the "chance find procedure" will be applied.

3.7 Petroleum Products and Energy Act No. 13 of 1990

Lead Ministry: Ministry of Mines and Energy

The statute controls the use and import of petroleum products. The purpose of the act is to "provide measures for the saving of petroleum products and an economy in the cost of their distribution, and for the maintenance of their price; for control of the furnishing of certain information regarding petroleum products; and for the rendering of services of a particular kind, or services of a particular standard, in connection with motor vehicles; for the establishment of the National Energy Fund and for the utilization thereof; for the maintenance of the price thereof; for control of the furnishing of certain information regarding petroleum products”

3.8 Forest Act, No. 12 of 2001

Lead Ministry: Ministry of Agriculture, Water and Land Reform

The purpose of the act, which prohibits tree cutting, is to "to provide for the establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and control and management of forest trees; to repeal the preservation of Bees and Honey proclamation, 1923; the preservation of Trees and Forests Ordinance, 1952; and the Forest Act of 1923."

The constitution specifies the role of the Ombudsman, commits the government to the sustainable exploitation of Namibia's natural resources for the benefit of all Namibians, and outlines the obligation to look into complaints about the excessive exploitation of living natural resources and the unjustified exploitation of non-renewable resources. According to Article 95, the government "shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at maintenance of ecosystems, essential ecological processes, and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of the people."

3.9 Atmospheric Pollution Prevention Ordinance 11 of 1976

Lead Ministry: Ministry of Health and Social Services

The Health Act 21 of 1988 has an impact on this ordinance and it provides for the control of air pollution. With the exception of East Caprivi, the entire country of Namibia is designated as a controlled territory under this ordinance for the purposes of section 4(1) (a) of the law.

3.10 Hazardous Substance Ordinance, No. 14 of 1974

Lead Ministry: Ministry of Safety and Security

Toxic material management is outlined in the ordinance. It encompasses import and export as well as production, sale, usage, disposal, and dumping. The ordinance covers importation, storage, and handling but does not specifically address environmental concerns.

3.11 Namibian Water Corporation (Act 12 of 1997)

Lead Organization: Namibian Water Corporation

The statute addresses environmental impact assessments, pollution reduction, and water restoration in prospecting, mining and mineral processing areas.

3.12 Public and Environmental Health Act, 2015

Lead Ministry: Ministry of Health and Social Services

This Act establishes a foundation for a planned, standardized public health and environmental health system in Namibia and addresses incidental issues.

3.13 Agricultural (Commercial) Land Reform Act 6 of 1995

Lead Ministry: Ministry of Lands and Resettlement

To make provisions for the State's purchase of agricultural land for the purposes of land reform and the distribution of that land to Namibian citizens who do not already own or otherwise have access to any or sufficient agricultural land, with a priority given to those citizens who have been negatively impacted in their social, economic, or educational standing as a result of previous discriminatory laws or practices; to grant the State a preferential right to purchase agricultural land for the purposes of land reform

3.14 Labour Act No.11 of 2007

Lead Ministry: Ministry of Labour, industrial Relation and employment creations.

This statute outlines the essential requirements of employment, including the occupational health and safety requirements, minimum salaries, and fundamental rights.

The proposed project would adhere to strict health and safety regulations, which include requiring the use of particular PPE in designated places to offer adequate protection against health and safety threats. It is necessary to label and store hazardous materials properly. In order to protect worker and environmental safety, the project will make sure that personnel who are in charge of and working with hazardous compounds are aware of the specific hazardous substances.

4. Environmental Act requirements

The proposed processing operations fall among those that, in accordance with Section 27 of the Environmental Management Act (EMA) and the Environmental Regulations process (GN 30 of 2012), cannot be carried out without first conducting an EIA. As a result, a certificate of environmental clearance must be obtained in accordance with regulation 6 of the environmental regulations from 2012. The proposed development is one of a number of activities that must have an Environmental Clearance Certificate (ECC) before it can be carried out. According to the Environmental Management Act, No. 7 of 2007, and its rules, the following activities are listed as being sparked by the project:

- Building facilities for any procedure or activity that calls for a permit, right, or other type of authorization, as well as renewing a permit, right, or other type of authorization in accordance with the Minerals (Prospecting and Mining Act), 1992. Additional mining or resource extraction techniques, whether or whether they are permitted by law.
- The exploitation, modification, conservation, and associated activities of resources.
- The removal of surface or groundwater for use in industry or commerce.

5. Impact assessment approach and methodology

The Environmental Impact Assessment (EIA) Regulations No. 30 of 2012, published under Namibia's Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007), and in accordance with the 1995 Cabinet-approved Environmental Assessment Policy for Sustainable Development and Environmental Conservation, govern Namibia's environmental assessment process. This report has taken into account all the specifications for assembling all the supporting paperwork for

the submission of an application for an environmental clearance certificate. This environmental assessment's primary goal is to identify and evaluate any potential environmental effects that could arise from the proposed lithium processing operation on mining claim 73418. In short, an environmental assessment approach is used to improve developmental interventions by safeguarding biotic, physical, and human settings. This is one element of the project's environmental planning and management that concentrates on the project's approval phase. Assessments of the activities connected to the proposed processing project's potential positive and negative environmental repercussions are included in the report. The assessment covers the following developmental stages:

- Construction
- Operation and ongoing monitoring
- Decommissioning and closure

Together with the EMP, this assessment report will give the Ministry of Environment, Forestry, and Tourism (MEFT) enough data to make an informed decision. The activities carried out during the assessment phase are outlined below.

- Project inception and screening

  To inform the public of the start of the EIA process and to get clarification on the procedure to be followed, the project was registered on the online ECC portal (eia.met.gov.na).

- Process for including the public in the initial assessment

  The goal of the public assessment process was to make sure that interested and affected parties (I&APs) were made aware of the planned project, given a fair amount of time to sign up for the project database, and given the opportunity to offer preliminary feedback. The following list of actions conducted during this phase:

  Identification of I&AP: A database of I&AP stakeholder information particular to the project was created, and it has been updated as needed. You can find a copy of the I&AP database in Appendix A.

Background Information Document (BID) and letter of notification: BIDs were sent through email to the I&APs database's stakeholders and the appropriate authorities. After the project started, a notification letter was also given out for evaluation and discussion for a period of three weeks. The BID was created with the intention of informing I&APs about the proposed project and the assessment procedure being used. A registration and response form that was attached to the BID gave I&APs the chance to contribute their names, contact information, and project-related feedback. In Appendix D, a copy of the BID is provided.

- Gathering and Examining the Draft Assessment Report

  The initial Public Participation Process comments were incorporated into the Draft Assessment Report in accordance with Section 8 of the EIA Regulations of 2012. The Draft Assessment Report will be made available for 14 days as an additional period for further comments submission.

- The completion of the assessment phase and the final report of the evaluation

  The Final Assessment Report (FSR) summarizes the following: the legal and policy framework; the approach to the EIA and process methodology; the project's need and desirability; proposed project activities; significant features of the receiving environment; and significant issues of concern that will be further investigated and assessed. There will be a compilation and response to all written submissions made during the DSR review and comment period. A competent authority will get the FSR. Then, pursuant to Section 32 of the Environmental Management Act of 2007 (No. 7 of 2007), the competent authority is required to provide a recommendation.

6. Premises and restrictions of the evaluation study

The following presumptions and limitations are applicable since this EIA report is based on information that is currently available:

- The report is based on data on the project that was supplied by the proponent.

- At the time of conducting the studies and preparing this report, it is assumed that the proposed activities and all plans, maps, line boundaries/coordinates, and pertinent data sets received from the proponent, project partners, regulators, and competent authorities are current and valid.
- The descriptions of the natural and social settings are based on fieldwork, pertinent specialist studies, and recommendations to be included in the EIA/Scoping and EMP reports on the impact assessment, mitigation methods, and recommendations.

7. An overview of the EIA procedure

The Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations, 2012 served as the framework for the EIA and EMP procedures. The actions conducted in the environmental assessment process and the next steps are outlined as follows:

- The background information document (BID) preparation (performed in May 2023).
- The creation of the public notice, which was then printed for two weeks straight in local newspapers as part of the mandatory public consultation process (completed in August 2023).
- Printed public announcements in the Windhoek Observer (19 July–02 August 2023) and the Confidante Newspaper (21 July–04 August 2023).
- Where the public meeting was held, Uis Community Hall in Uis, site notices were posted all around.
- The assessment report took into account every point expressed. As stated in the assessment report's section on public engagement, these submissions were laid out and addressed.
- Online project registration with MEFT via a portal (www.eia.met.gov.na) (conducted in July 2023).
- I&APs have access to a stakeholder registry where they can submit comments and suggestions through email to be included in the EIA and EMP Reports (03 July - 09 August 2023).

- On May 8, 2023, a public meeting was organized at the Uis community hall in the settlement of Uis.
- Hard copies of EIA and EMP reports are to be delivered to the Environmental Commissioner in MEFT via the MME (Competent Authority), and digital copies are directly submitted to MEFT via the portal (to be completed in August 2023).
- After submitting the ECC application to the Environmental Commissioner, interested and affected parties will have an additional 14 days to comment or provide input on the proposed project activities directly to the Environmental Commissioner via the MEFT digital portal at www.eia.met.gov.na (to be completed in July-August 2023).
- Await the Environmental Commissioner's decision (from August 2023).

Environmental and Social Baseline

8. Environmental Baseline

The baseline study covered various environmental aspects, including: climate, water Resources, soil (geology) and Land Use, biodiversity, Noise and Vibration, Traffic and Transportation.

8.1 Climatic Physiography

The location of the proposed processing plant is in the Escarpment between the Namib Desert and the Central Plateau, which places it in a transitional region between an arid climate and a hot semi-arid climate (Köppen: hot desert climate).

8.1.1 Rainfall

The project area experiences summer rainfall, with >85% of the annual rainfall falling between November and March. The months of January through March see the most precipitation, with an average 45mm of rain falling in March (Fig. 4). The graph below displays the patterns of rainfall in the project area. There are semi-arid climatic conditions in the area, and there is just 130 mm of yearly rainfall. The maps below indicate that there is a net water deficit since the yearly average potential evaporation rate is far higher than the annual average rainfall. May through October are

the driest months with 0mm of rain. The maps below indicate that there is a net water deficit since the yearly average potential evaporation rate is far higher than the annual average rainfall (Figs 6-7). In the previous 14 years, the region that includes Okambahe, Nu-Uis, and Uis has seen the highest rainfall, with 410 mm in 2011, and the second-highest rainfall, 198 mm in 2018 (Fig. 5).

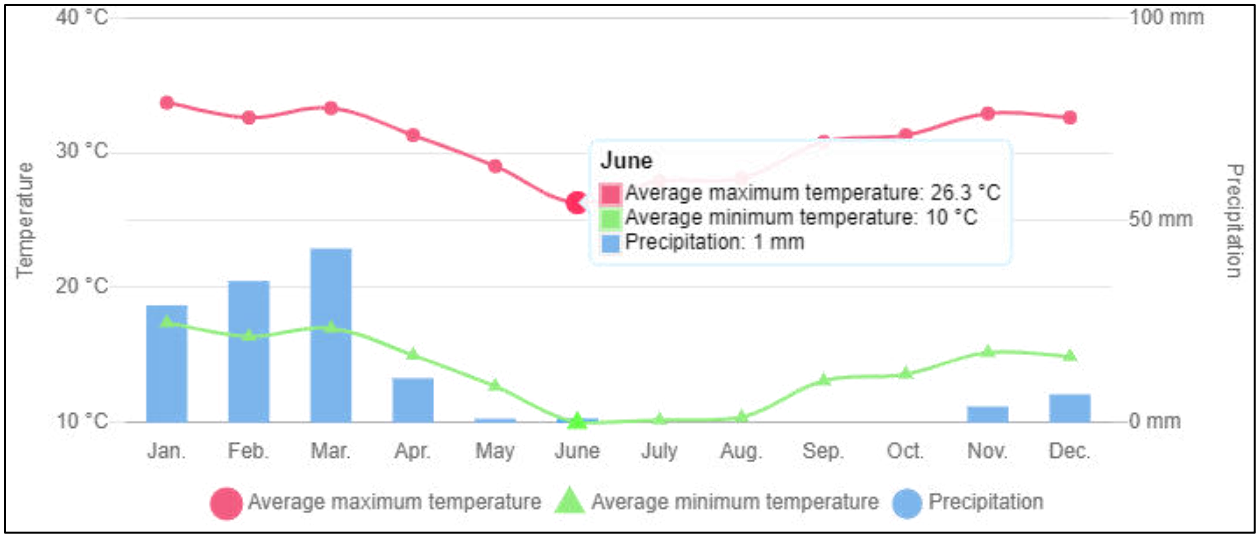

Fig. 4. Monthly average temperature and rainfall graph for Uis and surrounding areas (source: worldmeteo, 2023).

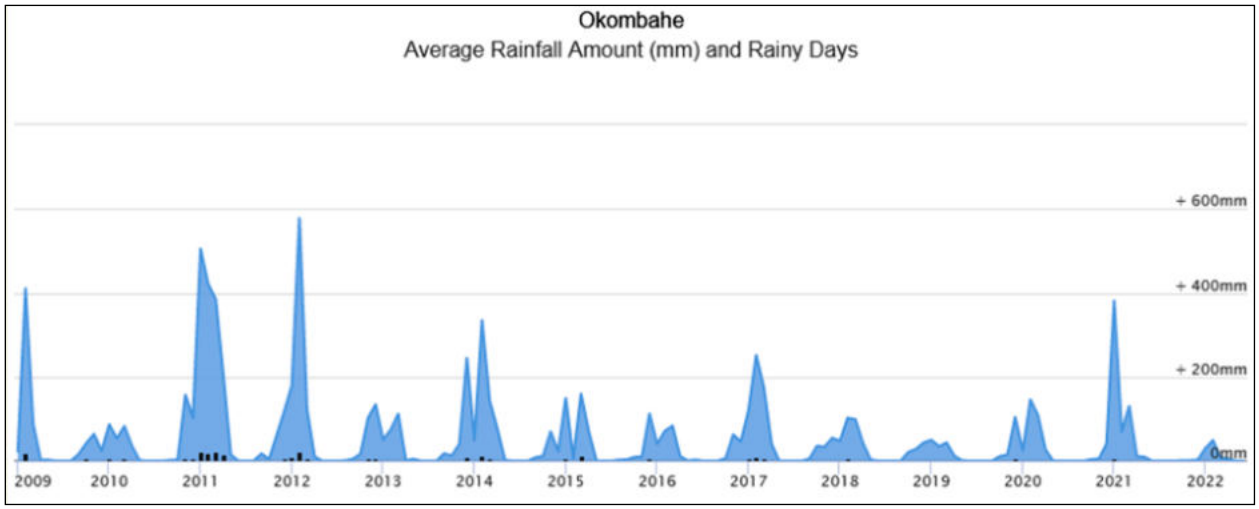

Fig. 5. Annual average rainfall graph Okombahe and the surrounding areas for the past 14 years (source: Weather-atlas, 2023).

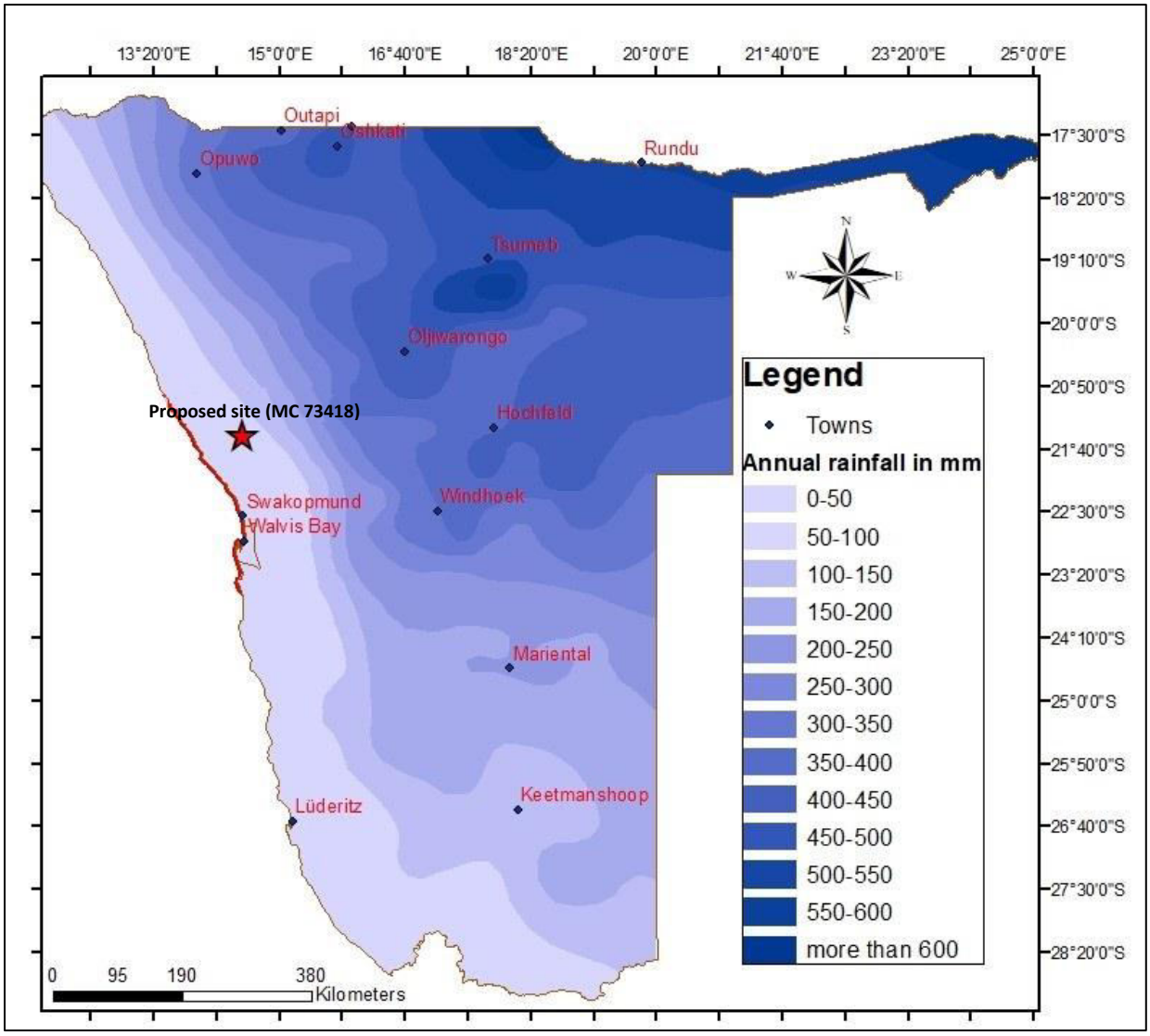

Fig. 6. Average annual rainfall in Namibia (ACACIA, 2002).

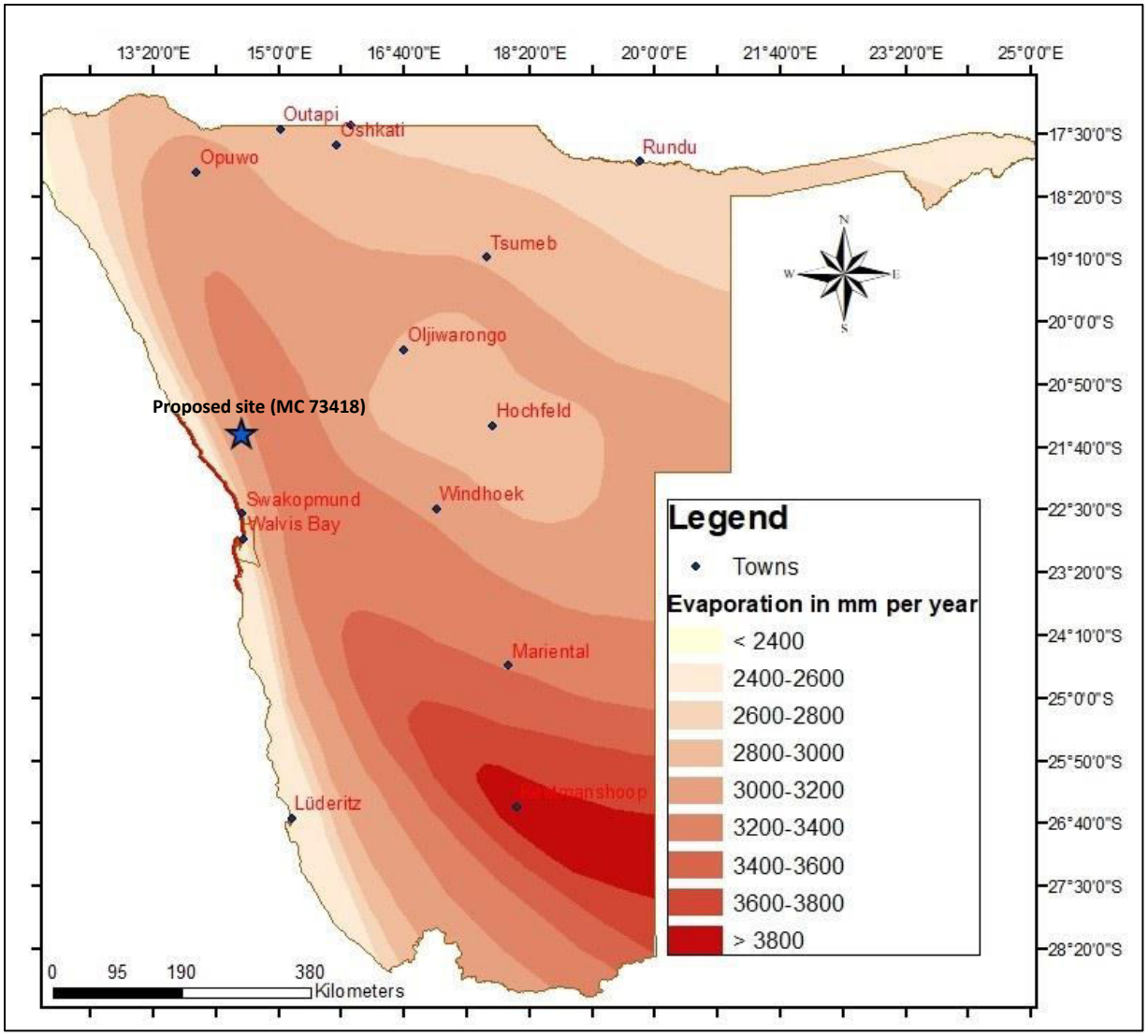

Fig. 7. Average annual evaporation in Namibia (ACACIA, 2002).

8.1.2 Temperature

The majority of the time, the days are warm, with the exception of the summer months when they can be extremely hot (Figs 8 – 9). The winter months of April through August see average highs of 23°C, while the summer months of September to March see average highs of 30 °C (with temperatures frequently exceeding 40°C). The average maximum temperature is 32.4ºC in October, and the average minimum temperature is 23.6 ºC in June. The average minimum temperature is 9.8 degrees Celsius in July and can reach 20.1 degrees Celsius in December. The graph below displays the lowest and highest temperature readings during a 13-year period, from 2009 to 2022.

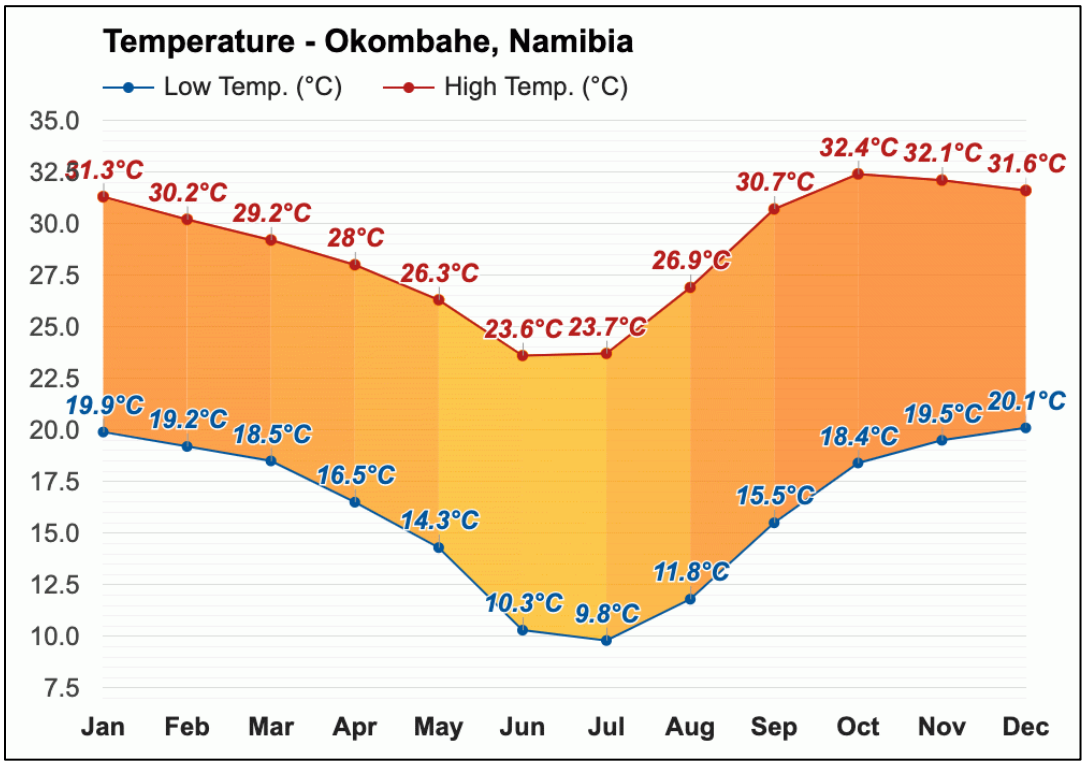

Fig. 8. Monthly average minimum and maximum temperatures of Okombahe and the surrounding areas (source: Weather-atlas, 2023).

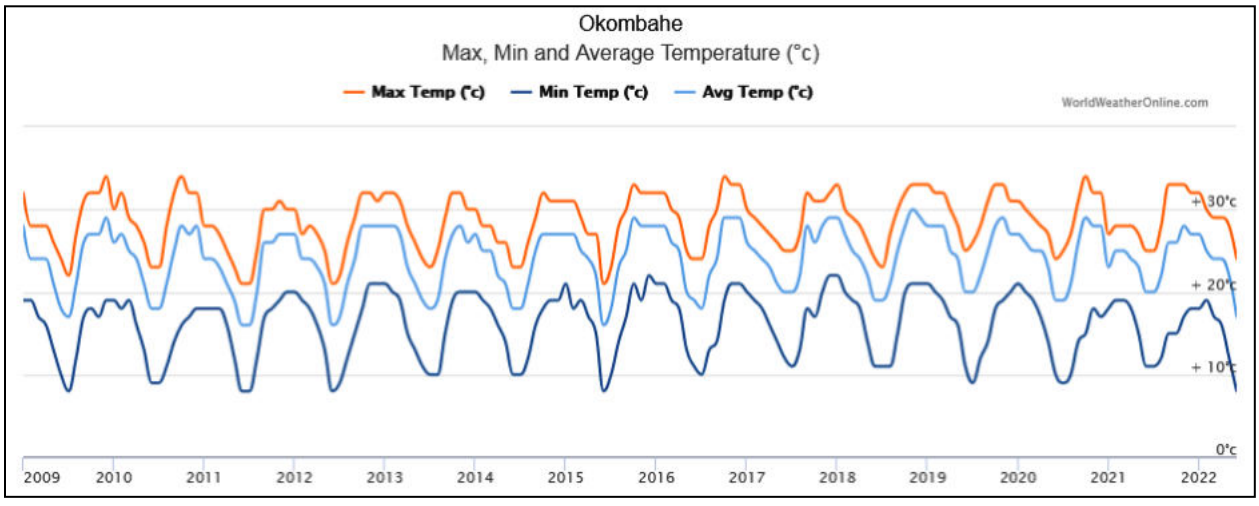

Fig. 9. Annual average minimum and maximum temperatures of Okombahe and the surrounding areas for past 14 years (source: Weather-atlas, 2023).

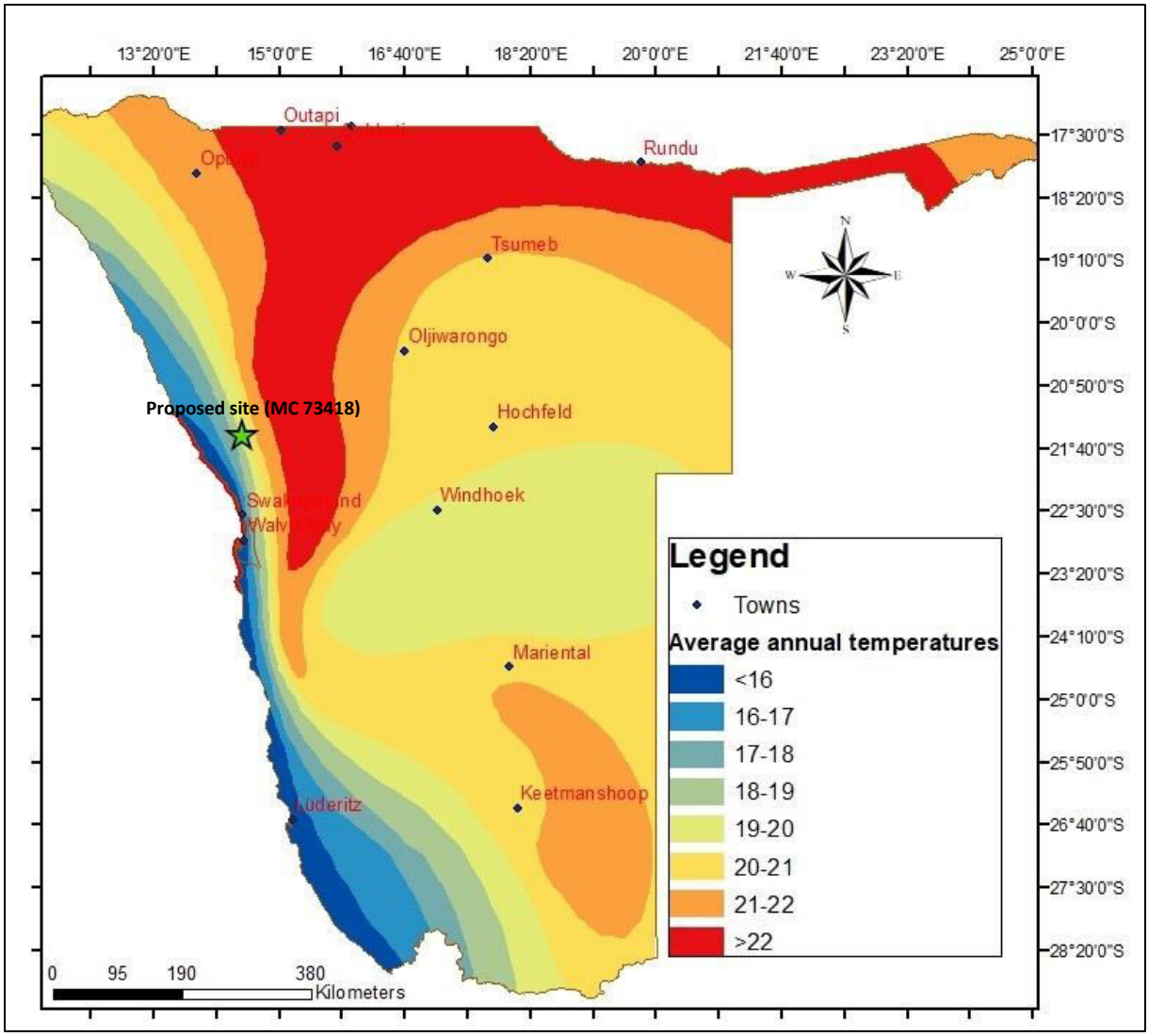

Fig. 10. Average annual temperature in Namibia (ACACIA, 2002).

8.1.3 Wind

The average wind speed in the project region ranges from 9.1 km/h, which is typically encountered in February, to 13.1 km/h, which is typically experienced in July (Fig. 11). The annual average wind speed in Okombahe is depicted in Fig. 11 below. There are two primary trends in the wind patterns in Okombahe; in the summer, high frequency, southerly to south-westerly winds prevail, while in the winter, high frequency, easterly to north-easterly winds prevail. The east winds that are produced over the scorching Namib Desert during winter have a significant impact on temperature, causing temperatures in the upper 30^{o}C and frequently carrying a lot of sand. It's crucial to know the wind direction and speed in order to forecast how to reduce the impact of dust.

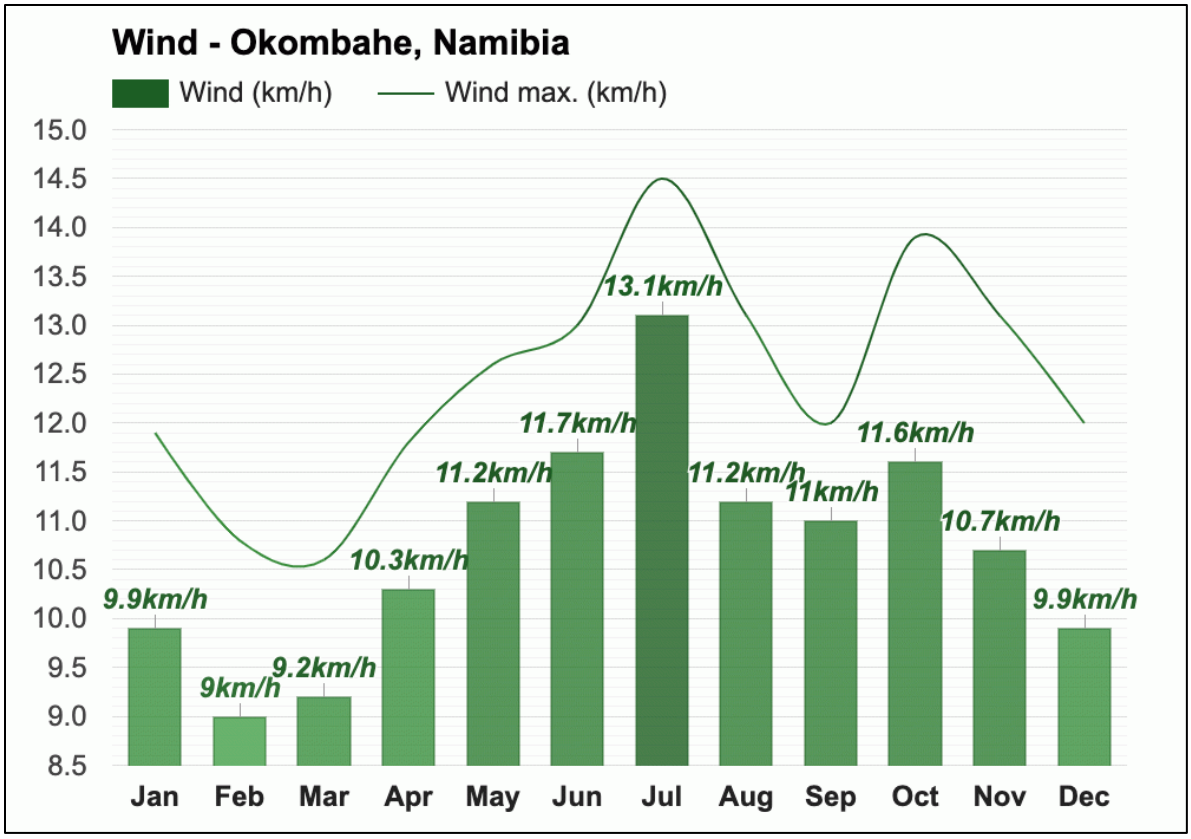

Fig. 11. Average wind speed in Okombahe. An average of the wind speed per month is taken (source: Weather-atlas, 2023).

8.1.4 Humidity

The amount of water vapor in the air is gauged by the concept of humidity. Precipitation is more likely to occur in humid environments. According to the Weather Atlas/Okombahe-climate (2022), relative humidity in Okombahe typically ranges from 20 to 30%. However, it can reach as high as 51% in March and as low as 21% in September.

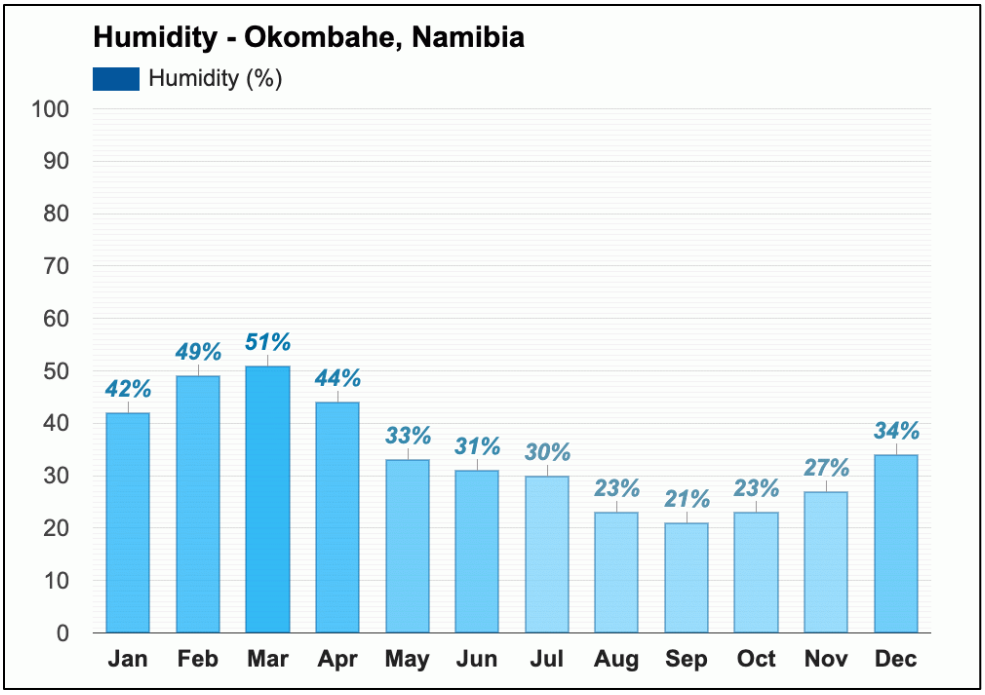

Fig. 12. Average humidity in Okombahe and the surrounding areas (source: Weather-atlas, 2023).

8.1.5 Air Quality

According to data from accuweather.com, the area's air quality is generally great, with an AQI of 16. It is very good that the ground-level ozone (O3) concentration is around 16 g/m3. PM 2.5 concentrations are approximately 7 g/m3. The PM10 particle matter is approximately 4 g/m3. There are no detected amounts of sulfur dioxide (SO2), carbon monoxide (CO), or nitrogen dioxide (NO2) in the area. The emissions and dust produced by automobiles traveling on gravel roads, the dust produced by livestock grazing, and wind erosion from exposed locations are all likely sources of air pollution in the area.

8.2 Hydrology and water Resources

8.2.1 Surface water

The Project is situated in an area with limited access to freshwater, a semi-arid environment, and an arid climate with few surface hydrological features including rivers, lakes, and dams. Surface water is only accessible following rainstorm occurrences for a brief amount of time due to the research area's arid climate. Around the Uis village, however, a number of previously mined open

pits are submerged in water. The Omaruru River is located in the upper north of the project. It has its headwaters in the region just north of the Etjo Mountains and south-east of Kalkfeld, and it flows generally south-westward until it reaches the sea at Henties Bay after about 300 km. Its catchment area is about 11,870 km^2, and it has a length of about 300 km. Numerous sites along the river (Omaruru, Okombahe, Nei-Neis, and Omdel) have significant alluvial deposits that serve as useful aquifers for groundwater abstraction. These deposits are replenished by intermittent flood episodes.

8.2.2 Groundwater / hydrogeology

The project area is situated in the Khomas, Erongo, and Otjozondjupa Regions of the Omaruru-Swakop River basin. The region with little or no groundwater is where the project area is located (Fig. 12). However, a moderately productive but variable aquifer connected to faulted and karstified carbonate rocks lies beneath the eastern portion of the project area. The vast carbonate deposits and low surficial coverings in the area have good secondary hydraulic qualities that are related to regional groundwater. The shallow range of 15 to 22 meters below ground level (m bgl) is where groundwater is found. An unconfined aquifer system covers the area and is exposed to pollution in the event of surface spills. Therefore, it is advised that the proponent drill at least one monitoring borehole so that quarterly groundwater quality assessments can be completed. Should the need for groundwater usage emerge, permission will be sought from the concerned landowners as well as the Ministry of Agriculture, Water and Land Reform (MAWLR) for borehole drilling and groundwater abstraction.

Potable water to the residents of Uis (envisaged source domestic water consumption for the project) is bulk pumped by NamWater from the Nei-Neis Water Supply Scheme south of Uis to a reservoir within Uis. The power supply for the Uis proposed processing plant will be diesel generators.

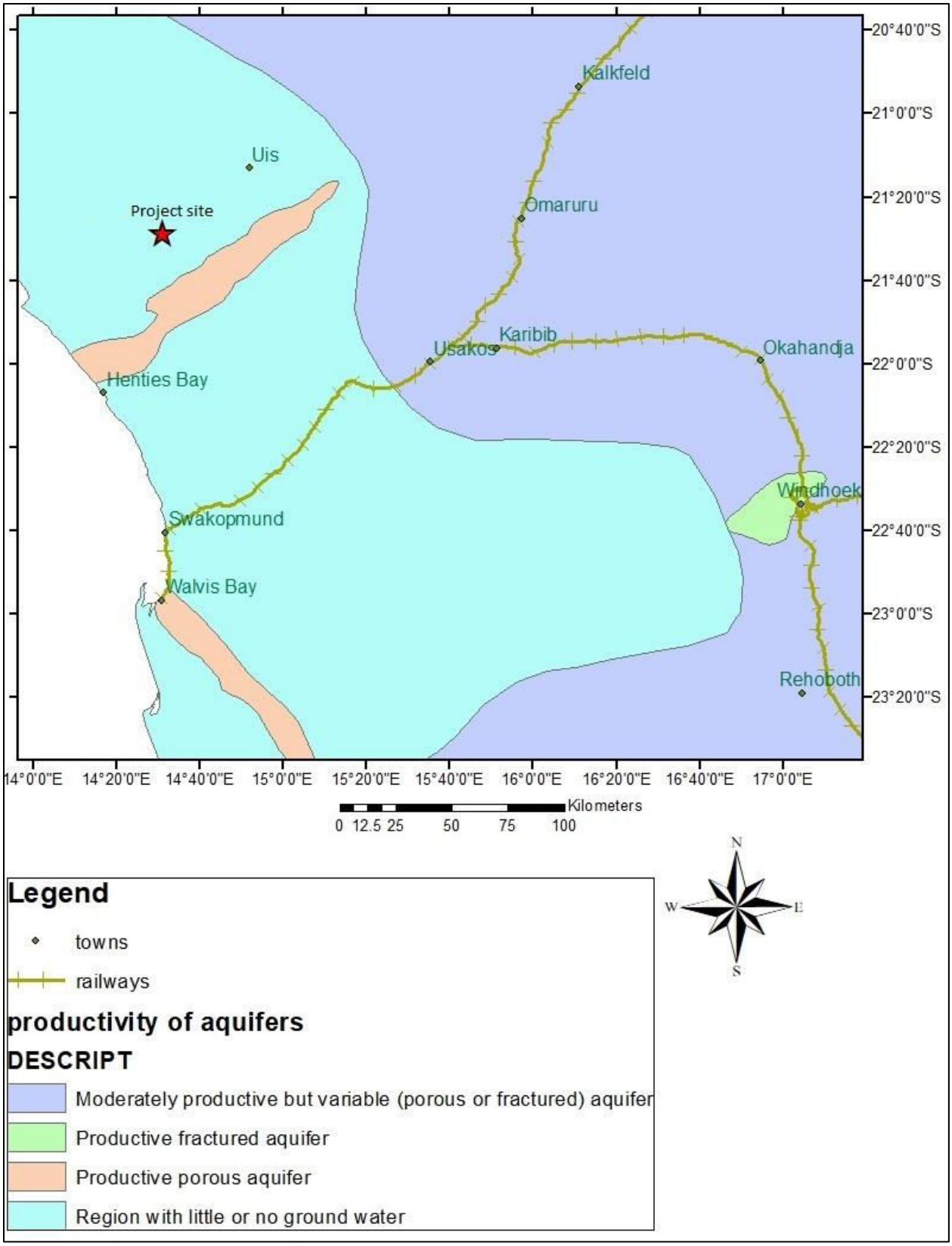

Fig. 13 Hydrogeological Map of the project area. The project site is located in an area with little or no ground water.

8.3 Geological setting

8.3.1 Regional geology

The project region is located within the Damara belt, which is a component of the Pan-African collision bands that formed the Gondwana supercontinent in southern Africa (Miller, 2008). The Damara Orogen is a Neoproterozoic orogen that has three arms: the Kaoko Belt, a coastal arm with a NNW trend, which extends into Angola; the Damara Belt, a belt with a NE trend, which runs through the center of Namibia and across Botswana to the Zambezi belt; and the Gariep Belt, a belt with a southerly trend that runs into northwestern South Africa. Between 800 or 900 Ma and 460 Ma, the Kaoko, Damara, and Gariep Belts underwent intra-continental rifting, spreading, subduction, and continental collision episodes. The Congo/Angola Craton subducted beneath the Kalahari Craton in the Damara Belt, causing a continental collision.

The project area is in the NE-trending, Damara orogenic belt which has been divided into several different zones on the basis of stratigraphy, metamorphic grade, structure, geochronology, plutonic rocks and aeromagnetic expression (Miller, 1983, 1998). The zones are separated by tectonic lineaments, and these are, from north to south: the Northern Platform (NP), Northern Margin Zone (NMZ), Northern Zone (NZ), Central Zone (CZ), Southern Zone (SZ), Southern Margin Zone (SMZ) and the Southern Foreland (Fig.22). The Central Zone is divided into northern (nCZ) and southern (sCZ) zones. The Okahandja Lineament zone (OLZ) is routinely regarded as part of the SZ (Miller, 2008). The project area is located in the Northern Zone (NZ) (Fig 25).

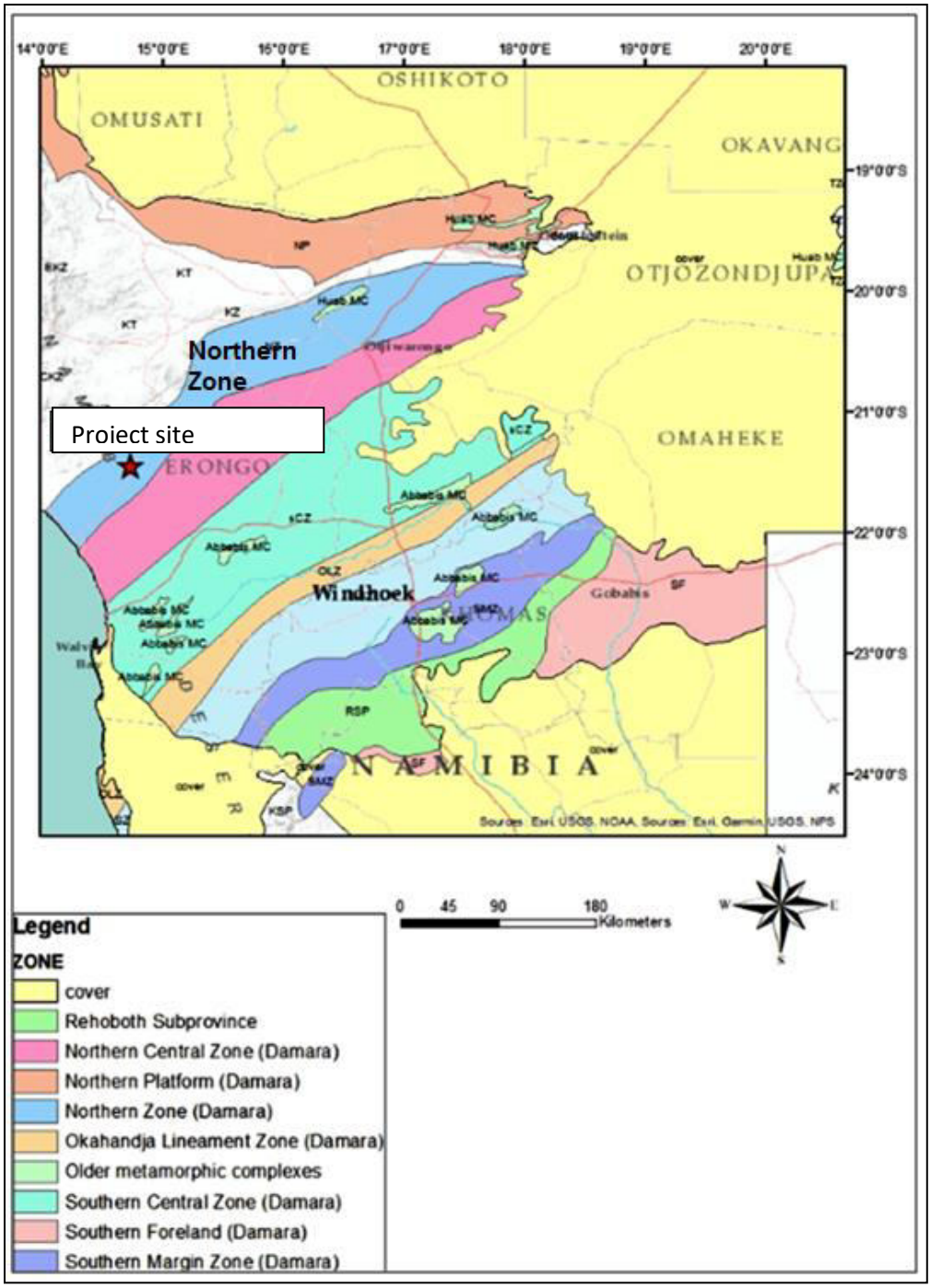

Fig. 14. Tectonic zones of the Damara orogenic belt. The proposed project site on mining claim 73418 is located in the northern zone (NZ) of the Damara belt.

Within the Damara Sequence's Northern Zone (NZ), the project area is located. The Cape Cross Uis band, often referred to as the northern Namibian tin belt, is a northeast-trending belt that spans 120 km from Cape Cross at the Atlantic Ocean in the west to beyond the village of Uis in the east (Diehl, 1986; Wagener, 1989). The Cape Cross-Uis belt and the Sandamap-Kranzberg belt are well-known tin sources, and this belt is a member of a group of many northeast-trending belts. Numerous pegmatites that have intruded into gneisses, Pan African granites, schistose greenschist facies Damaran meta-sedimentary rocks, and other rocks can be found in the Cape Cross-Uis belt (Diehl, 1993). These post-tectonic pegmatites have notable concentrations, of Sn, Nb, Ta and Li.

8. 4 Topography

Due to its geographic location along the escarpment separating the Namib Desert from the Central Plateau, the Project is located in an area where a semi-arid environment transitions into an arid climate. With an elevation between 800 and 900 m above sea level, the relief is moderate to high. The Brandberg Mountain climbs to about 2500m around 35 kilometers to the north. The research area is characterized by mountains and flat topography, with the exception of a few small ridges and hills that create noticeable elevated topographic surface expressions.

8.5 Soil and Land Use

The section ponders onto soil characteristics, land cover, and land use patterns within the project site. The processing plant hosting mining claim is largely covered by rock outcrops northwards and the area to the southern side is covered by Petric Gypsisols soil (Fig. 15). Gypsic duricrusts, also known as petric gypsisols, feature a layer that is highly cemented or indurated and contains at least 5% (by volume) of gypsum. This layer has formed under hydromorphic circumstances and has an average depth of more than 100 cm. They are found in the semi-arid dry areas where evapotranspiration far outweighs precipitation and are unlikely to support the establishment of vegetation. This explains the absence of vegetation in places where it is present, such as the proposed project site, and translates into minimal to non-existent potential environmental damage to flora. The project is remotely located and there is no substantial local land utilization taking place in the vicinity of the proposed site. The only and main agricultural activity in the surrounding

areas is raising livestock (goats, sheep, and cattle), as the terrain is unsuitable for growing crops due to its aridity and low soils. Due to persistent long draughts, even raising animals is becoming more and more risky. Small-scale tourism-related businesses, the sale of handicrafts, and semi-precious stone mining are additional sources of income.

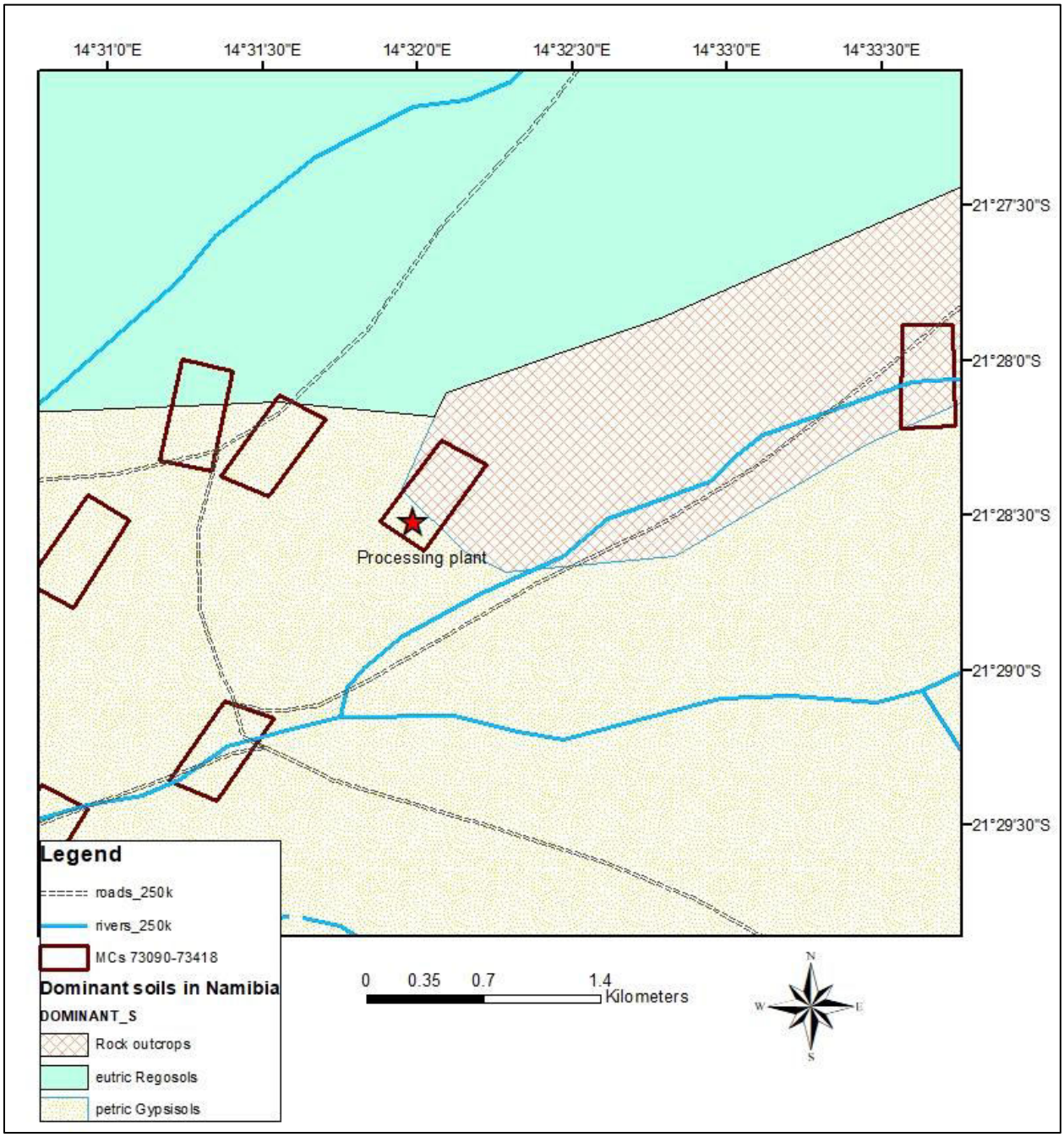

Fig. 15 Soil types within the project site and the surrounding

8.6 Biodiversity: fauna and flora

This section covers inventory of plant and animal species, including rare and endangered species, in the surrounding area. The identification of high-risk habitats before to the start of the proposed activities, along with ecologically appropriate mitigations, would decrease the severity of the overall impact. As with any development initiatives in pristine areas, consequences on fauna and flora are unavoidable. During the site visits on June 23, 2022, an evaluation of the proposed mineral processing's potential effects on the fauna and flora was done. Through field observations, recording, and data collection, the Mining Claim area was thoroughly evaluated. The material is based in part on a thorough literature review. Identification of all probable amphibians, reptiles, mammals, and plants anticipated in the project region is the goal of the flora and fauna literature review. There are not any species unique to the study region, however the planned investigation area does host a small number of fauna species. The usage of species lists of plants identified within the quarter-degree squares, which were taken from the database, Botanical Research and Herbarium Management System, at the National Botanical Research Institute in Windhoek, further improved the assessment of the flora.

8.6.1 Flora

The semi-desert vegetation type is present in the vicinity of the mining claims. Generally speaking, vegetation is sparse in shape, with few trees and a narrow range of grass. The vegetation of the Namib Desert's bleak and barren plains is primarily confined to the sandy beds of non-perennial drainage systems, which only flow after heavy rains in their catchment areas farther away. Despite being dry, these riverbeds frequently have shallow subsurface water throughout the year. The topography is more stony and less vegetated around the project area. Only after good local rain events can grass cover develop. Up to 111 grass species, representing 73 to 88 different species, are thought to exist in the region (Müller, 2007; Van Oudshoorn, 1999). The endemic Setaria finite connected to ephemeral drainage pathways is the most significant grass anticipated in the area. Although the season (end of dry and beginning of wet) made it challenging to identify grasses, neither the protected species nor any of the identified grasses are specifically connected to the

proposed research region, which reduces the total impact on grasses. During site observation, a few Camelthorn (red-thorn, Acacia reficiens) trees and immature shrubs with creamy smooth bark known as kobas, Cyphostemma currorii, were also spotted.

8.6.2 Fauna

Mammals

The biome regions in the western highlands are home to Okombahe. The region is home to a wide range of species, including those found in the Okombahe reserve, as shown in the table below. There was no wildlife seen during the site visit, which took place during the day. This, however, does not imply that there was no wildlife in the project area; rather, it may be explained by the fact that species was hiding out of sight and away from human presence in the shadows of the distant foliage and possibly beneath rock outcrops. According to the literature evaluation, none of the species in the project area will be negatively impacted by the implementation of the planned project activities in the region.

Table 2: Mammal species which are likely to occur within the project area.

No	**Scientific name**	**Common name**	**No**	**Scientific name**	**Common name**
1	*Acinonyx jubatus*	Cheetah	6	*Oryx Gazella*	Gemsbok
2	*Antidorcas marsupialis*	Springbok	7	*Panthera leo*	Lion
3	*Crocuta crocuta*	Spotted Hyena	8	*Panthera pardus*	Leopard
4	*Equus zebra hartmannae*	Zebra	9	*Tragelaphus stresiceros*	Kudu
5	*Hyaena brunnea*	Brown Hyena	10	*Oryx Gazella*	Gemsbok

Reptiles

Griffin (1998) emphasized the is an existence of 261 species of reptiles in Namibia. Of the species of reptiles on the continent, these animals account for 30%. According to Griffin (1998), 55 species

of lizards inhabit Namibia. More than 60% of the reptiles found in Namibia are said to be protected by the conservation Ordinance, according to the author Griffin (1998). The project will not significantly influence the reptile species found in the proposed mineral processing activity area, despite the fact that proposed mineral processing activities do damage reptile habitat. With 129 species of lizards, Namibia is home to one of the continent's most diverse lizard faunas. The majority of vertebrate fauna species with restricted mobility, such as some reptiles, are expected to be impacted by the proposed mineral processing activities. Seven reptile species are strictly exclusive to the mining claims site, according to the literature review, which also revealed that there are about 40 reptile species likely to reside in the Uis area:

Table 3: Reptile species which are likely to occur within the project area.

Scientific name	**Common name**
Sepsina alberti	Albert's skink or Albert's burrowing skink
Pedioplanis husabensis	Husab sand lizard
Nanaqua spinytail lizard	Cordylus namaquensis
Cordylus campbelli	Campbelli's spinytail lizard
Cordylus pustulatus	Herero girdled lizard
Pachydactylus gaiasensis	Brandber thick-toed gecko
	Albert's skunk

Avian diversity

Simmons et al. (2003) note that although Namibia's avifauna is relatively limited in comparison to the equatorial regions of other parts of Africa with significant rainfall, 658 species have already been identified, including a distinct and varied group of dry endemics. Although Namibia's avifauna is rather scarce when compared to the heavy rainfall equatorial portions of Africa, there are about 650 species of birds that have been reported there. 14 species of birds are endemic or nearly endemic to Namibia, according to Brown et al. (1989), with the bulk of these species living in the Savannah, 10 of which are found in a dry north-south strip in central Namibia. There could

be up to 40 different bird species near the facility. even if some species, like the Ludwig's Bustard and the Kori Bustard, are red-listed

8.7 Noise and Vibration

Measurement of background noise levels and vibrations at various locations around the site. Unwanted sound that travels through a compressible medium, like air, is typically referred to as noise. Any pressure variation that the ear can detect is referred to as sound. Being subjective as opposed to being objective, the human response to noise is complicated and very variable. A baseline noise survey will be carried out for the Project's potential project site. A separate report with the findings of the noise effect evaluation will be submitted. Opencast mining and ore processing facilities are common sources of noise in the proposed Project. Blasting, drilling, ore and waste handling (loading, unloading, dozing) in open pits, on dump sites, and in crusher and plant areas, ore crushing and screening, haul truck traffic involving diesel mobile equipment use, and ore processing activities like crushing, screening, and milling will all produce noise on the project site.

8.8 Traffic and Transportation

This section covers data collection on existing traffic patterns and transportation infrastructure. This section covers assessment of surface water and groundwater quality, water flow, and availability in the project area. Mining claim 73418 is located approximately 50 km southwest (SW) of Uis settlement, within Okombahe Reserve, Dâures Constituency, Erongo Region, approximately 270 km northwest of Windhoek, the capital city of Namibia. The mining claim are situated on state land, accessed approximately 20km off-road via C35 and D2342 gravel roads. Routes C35 and C36 connects the towns of Hentiesbay and Omaruru respectively are the main roads that significant traffic volumes and are considered an important tourism route to the Brandberg mountain and the surrounding attractions. C35 is one of the primary access route to the site and will also serve as the route for transportation of the final products of the plant to the port.

9. Social Baseline

The receiving environment within the research area is described in this chapter. The physical environment, biological environment, and socio-economic environment are the three elements that make up the environment.

9.1 Socio-Economic Environment

The Erongo Region had a population of 150,809 people as of the 2011 Namibia Population and Housing Census, of which 70,986 were women and 79,823 were males. The population of the area was expanding at a rate of 3.4% each year. Only 13 percent of people resided in rural areas, while 87% of people lived in metropolitan areas. This is a result of a significant share of people moving from rural to urban areas in search of employment, especially among young individuals. The top four languages used at home in the Erongo Region are Oshiwambo (39%), Afrikaans (20%), Nama/Damara (19%), and Otjiherero (10%). Seven constituencies make up the Erongo Region: Arandis, Dâures, Omaruru, Karibib, Swakopmund, Walvis Bay Rural, and Walvis Bay Urban. The proposed project is located in the Dâures Constituency. Dâures Constituency has a total size of 17786.6 km^2, or 28% of the entire area of Erongo Region. With a population density of about 0.6 people per km^2, the Dâures Constituency is one of the least populous areas in the Erongo Region and is mostly home to Damara and Herero speakers. Population data for the Dâures Constituency is shown in Table 4.

Table 4: Statistics of Dâures Constituency.

Dâures constituency statistics	
Population	11,350
Male	6, 041
Female	5, 309
Private households	2, 911
Population under 5 years	15 %
Population aged 5 to 14 years	23 %
Population aged 15 to 59	51 %
Population aged 60+ years	11 %
Female : male ratio	100: 114
Female head households	40 %
Male head households	60 %
People with disability	4 %

Employed population	56 %
Unemployed population	44 %
Retired population	63 %
Literacy rate 15 + years, %	82 %
Household income from pension	24 %
Household income from business and non-farming activities	9 %
Household income from farming	24 %
Household income from cash remittance	11 %
Household income from wages and salaries	28 %

9.1.1 Current Land Uses

The only and main agricultural activity is raising livestock (goats, sheep, and cattle), as the terrain is unsuitable for growing crops due to its aridity and low soils. Due to persistent long draughts, even raising animals is becoming more and more risky. Small-scale tourism-related businesses, the sale of handicrafts, and semi-precious stone mining are additional sources of income.

Cultural and Heritage Resources: Identifying places of cultural heritage and evaluating conventional land use methods. Section 9(a) of the Environmental Regulations of 2012 mandates that a disclosure of all the tasks to be undertaken as part of the assessment process, including any specialists to be hired if necessary, be made. An expert investigation of archaeology was carried out by a qualified archaeologist. In order to identify any potential artifacts or human remains that might be nearby, a foot search was done as part of the inquiry. This report must be submitted with a letter of authorization from the Heritage Council of Namibia and an archaeological expert study. According to a desktop search, there are no nearby mining claims that have been recognized heritage sites by Namibia's National Heritage Council. At the subject site, an accidental find method might be necessary.

9.2 Stakeholder Mapping:

This section entails identification of stakeholders, including local communities, NGOs, government agencies, and other interested parties.

9.2.1 Legal framework

An crucial step in the environmental impact assessment process is public consultation. The proposed project's stakeholders and interested members of the public have the chance to voice any questions or concerns during the public consultation process. The instruments governing environmental impact assessment in Namibia are the Environmental Management Act of 2007 and associated EIA rules from 2012. Preventing and reducing the significant effects of activities on the environment is one of the Act's key goals, and it does so by giving interested and impacted parties the chance to participate throughout the assessment process and by ensuring that the assessment's findings are taken into account before any decisions about the activities are made. In accordance with Section 21 of the EIA Regulations, the person leading a public consultation procedure must notify all prospective interested and impacted parties by:

(a) Installing a notice board in a visibly visible location on the site's fence or border where the activity to which the application relates is being or will be carried out;

(b) Providing written notice to: (i) The owners and occupants of land adjacent to the location where the activity is being conducted or will be conducted, as well as to any alternative location; (ii) The local authority council, regional council, and traditional authority, as applicable; and (iii) Any other state organ with jurisdiction over the matter.

The public notifications (attached) were published in the regional newspapers during the months of July 2023 in accordance with the legislation' requirements. The public consultation procedure began on May 8, 2023, and it ended on August 9, 2023, for registration and submission of written inputs, comments, and objections to the environmental assessment process. The EIA Regulations explicitly specify that under Section 21(6) of the EIA Regulations, potential interested and affected persons must be given a reasonable opportunity to comment on the application.

On May 8th, 2023, a stakeholder's registry, as stated in Table 5, was established. The public meeting took place on May 8, 2023, in the Uis Community Hall in the Uis settlement. Pictures from the meeting are annexed to this report.

Through newspaper advertisements, the public was requested to submit written comments, input, or concerns to the proposed minerals processing activities (public notices are annexed to this report). The background information document (BID) annex to this report was distributed to all identified I&APs and to all registered stakeholders.

Table 5 (a): Register of Organs of State as per section 22(c) of the EIA regulations of 2012.

Table 5 (a): Register of Organs of State as per section 22(c) of the EIA regulations of 2012.

No.	**Name**	**Position**	**Organization**
1	Teofillus Ngitila	Executive Director	Ministry of Environment, Tourism and Forestry
2	Timoteus Mufeti	Environmental Commissioner	Ministry of Environment, Tourism and Forestry
3	Maria Amakali	Director: Water Resources Management	Ministry of Agriculture, Water and Land reform
4	Isabella Chirchir	Mining Commissioner	Ministry of Mines and Energy
5	N P Du Plessis	Senior Environmentalist	NamWater

(b)Registered stakeholders (register was made available from 08 May 2023).

No.	Name	Affiliation	Contact Details
1	Nelwin huseb	Secretary of Tsiseb Conservancy	<nelwinhuseb@gmail.com>
2	Allen Kandjai	Farming in Omungambu	<akandjai@b2gold.com>
3	Hafeni Hiveluah	Interested party (IP)	<hafexx@gmail.com>
4	Nelimona Iipinge	Namibian Environment and Wildlife Society	<ndeliimonachox@gmail.com>
5	Watjizaiye Menjono	Resident of Omungambu	<fwmenjono@gmail.com>
6	Desmond Van der Smit	Uis Property Owner	<desmond@vandersmit.com>

9.2.2 Public and Stakeholder Consultation Outcomes

Concerns and comments raised by interested parties as follows:

Mr Gregory N Huseb

- ✓ Mr Gregory N Huseb reminded the environmental consultant to liaise with the Tsiseb Conservancy on time as opposed to approaching them when in urgent need of a consent letter

Watjizaiye Menjono

- ✓ Watjizaiye Menjono, a resident of Omungambu and believed based on the published directions of the location of the proposed plant that it should in Omungambu.
- ✓ Requested for a map and coordinates to confirm.
- ✓ He also wanted details of the project

Allen Kandjai

- ✓ Allen Kandjai is farming in Omungambu which is not too far out from the said proposed locations requested details of the project
- ✓ Would you please share the relevant details (extent of area, scope, method etc.) in order to determine if we are directly affected.

Nelimona Iipinge requested to be registered as an interested party

Hafeni Hiveluah requested to be registered as an interested party

Desmond van der Smit asked the following questions:

- ✓ Air Quality Impacts: Could you please provide more details on the emissions expected from the generators used for power generation? I am keen to understand how these emissions might affect the local air quality and the potential health implications for nearby communities.
- ✓ Water Consumption and Contamination: Considering the significant water requirements of lithium processing, can you elaborate on the anticipated water consumption of the plant? Additionally, what measures are being put in place to address concerns about water contamination from processing by-products?

- ✓ Biodiversity and Habitat Disturbance: As the proposed plant's location is close to Uis, I am eager to know more about the potential impact on local biodiversity and habitats. Are there any specific plans to mitigate habitat disturbance and protect wildlife in the area?
- ✓ Noise and Light Pollution: Given the operation of generators and the plant's proximity to a road, could you provide insights into the expected levels of noise and light pollution? How do you plan to mitigate any potential adverse effects on wildlife and the surrounding environment?
- ✓ Traffic Impact: With the plant being situated near a road, what is the projected increase in heavy vehicle traffic? How do you plan to manage potential impacts on the road infrastructure and address concerns raised by local communities?
- ✓ Waste Generation and Management: I am interested in understanding the type and volume of waste that the lithium processing plant is expected to generate. How will you handle and dispose of waste responsibly, especially if hazardous materials are involved?
- ✓ Greenhouse Gas Emissions: Given that generators will be used for power generation, what steps are being taken to minimize the plant's greenhouse gas emissions and reduce its overall carbon footprint?
- ✓ Human Waste of Mine Workers: Could you provide information on the measures in place to manage human waste generated by the mine workers? How will you ensure proper sanitation and prevent any potential environmental contamination?
- ✓ Potential Issues with Fuel Storage: Can you elaborate on the safety measures that will be implemented to address potential issues with fuel storage? How do you plan to prevent spills, groundwater contamination, and other hazards associated with on-site fuel storage?
- ✓ Operating Life Span: Additionally, could you please provide information on the projected operating life span of the proposed lithium processing plant? Understanding the estimated duration of its operation will help in assessing the long-term environmental impacts and planning for potential site rehabilitation measures.
- ✓ Site Rehabilitation Plans: As part of responsible environmental management, I am keen to know about the site rehabilitation plans for the plant. Considering that mining and processing operations often result in significant disturbances to the environment, I am interested in learning about the measures and strategies you have in place to rehabilitate the site once the plant's operational life comes to an end.
- ✓ Ore Stockpiles: What is the projected size and appearance of the ore stockpiles that will be present on the plant site? How will the stockpiles be managed to minimize their visual impact on the surrounding landscape, especially considering the site's tourist attraction status?
- ✓ Waste Stockpiles: Similarly, could you provide information on the waste stockpiles generated during the lithium processing operations? How will you handle and manage these stockpiles to prevent them from becoming an eyesore and affecting the scenic beauty of the region?
- ✓ Stockpile Locations: Where are the planned locations for both the ore and waste stockpiles? Have efforts been made to strategically position these stockpiles to reduce their visibility from prominent tourist areas?
- ✓ Visual Mitigation Measures: Are there any planned visual mitigation measures to enhance the visual appeal of the site and minimize the impact of stockpiles on the overall aesthetics of the area? For instance, will landscaping or screening be employed to shield the stockpiles from view?

- ✓ Community Consultation: Have you engaged with the local community and tourism stakeholders to understand their concerns about the visual impact of the proposed plant and stockpiles on the tourism experience? How have you incorporated their feedback into your plans?

Public meeting

- ✓ Public meeting was held on Saturday 8 May 2023 at Uis Community hall.
- ✓ The only clarity that was requested during the meet was as to why as to why another EIA over mining claims that already have an ECC
- ✓ The attendants did not see the need for the meeting because the MC 73418 (the proposed location of the plant already has an ECC)
- ✓ The confusion was however, defused by explanation that the activities are different

All above stated concerns and questions were addressed.

10. Assessment of Impacts

This section gives a rundown of the various phases (construction, operations and decommissioning) of the proposed project's activities, along with any potential environmental effects.

Project Phases covered

1. Construction and Commissioning: Based on the design and technical plans, the lithium processing plant is constructed during this phase and this is expected to last approximately 18 months. The commissioning of the processing facilities, equipment installation, and structural construction are all included in this phase. To ensure safe and responsible building, safety procedures and environmental regulations are strictly adhered to.

2. Operations and Production: After the lithium processing plant's construction is finished, it moves into the operations stage. In this stage, raw lithium-bearing ores are processed to create

lithium concentrate. In order to achieve envisaged final product, quality control procedures are put in place while the plant's operational efficiency is continuously tracked and improved.

3. Decommissioning and Closure: As the lithium processing plant's operational life approaches its conclusion, the decommissioning phase starts. Equipment is appropriately disposed of or put to other uses when the facility has been securely deconstructed and shut down. The site is either returned to its pre-development status or put to other uses while following all applicable environmental and legal requirements.

10.1 Identified potential impacts

Positive impacts

Generating income from taxes and royalties, regional growth, creation of jobs.

Negative impacts

Impacts on ground and surface water, noise and vibrations, occupational health and safety, impact on terrestrial biodiversity (fauna and flora), heritage and archaeological significance, visual impact, fire and explosion hazards, solid waste management, and air quality (dust generation and fumes emission)

10.2 Impact assessment and analysis

This part studied and analyzed the effects of the mineral processing activities on the biophysical and human environment. The detected impacts were evaluated in terms of chance of occurrence, spatial size, magnitude, severity, and duration. The approach of impact assessment that was used to evaluate the importance of affects both before and after mitigation. This methodology guarantees uniformity and allows for the consistent handling of potential impacts. Each impact was examined using the assessment methods listed below:

Table 6 Impact assessment criteria

PART A: DEFINITION AND CRITERIA		
Definition of significance		Significance = consequence x probability
Definition of consequence		Consequence is a function of severity, spatial extent and duration
Criteria for ranking of the severity of the environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favorable publicity.
Criteria for ranking the duration of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the spatial scale of impacts	**L**	Localized - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local

	H	Widespread – Far beyond site boundary. Regional/ national

PART B: Determining consequence					
Severity= L					
Duration	Long term	**H**	**Medium**	**Medium**	**Medium**
	Medium term	**M**	**Low**	**Low**	**Medium**
	Short term	**L**	**Low**	**Low**	**Medium**

SEVERITY = M					
DURATION	Long term	**H**	**Medium**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	High
	Short term	**L**	**Low**	**Medium**	Medium

SEVERITY = H					
DURATION	Long term	**H**	**High**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	**High**
	Short term	**L**	**Medium**	**Medium**	**High**
			L	**M**	**H**
			Localized Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
			Spatial scale		

PART C: Determining significance				
Definite/ Continuous	**H**	**Medium**	**Medium**	**High**
Possible/ frequent	**M**	**Medium**	**High**	**High**
Unlikely/ seldom	**L**	**Low**	**Low**	**Medium**
		L	**M**	**H**
		Consequence		

PART D: Determining significance					
Probability (of exposure to impacts)	Definite/ Continuous	**H**	**Medium**	**Medium**	**High**
	Possible/ frequent	**M**	**Medium**	**Medium**	High
	Unlikely/ seldom	**L**	**Low**	**Low**	Medium
			L	**M**	**H**
			Consequence		

PART D: Interpretation of significance	
Significance	**Decision guideline**
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

H+ = High positive; H= High; L+ = Low positive; L = Low; M = Medium

Mitigation measures and monitoring

Based on the findings of the EIA, a comprehensive set of mitigation measures has been proposed to address potential environmental and social impacts. These measures will be integrated into the project's operational practices to ensure sustainable development and minimize the project's ecological footprint.

Practical, attainable mitigation methods that will reduce or eliminate the consequences must be suggested for implementation when negative impacts are detected. Mitigation objectives have been defined in this regard. Reasons have been provided when mitigation is not practical. To maximize the advantage to be obtained in the event of positive consequences, enhancing methods are advised. When applicable, it has been suggested to monitor requirements using quantitative standards to evaluate the efficacy of mitigation activities. These have to specify what needs to be done, by whom, and how often and when. By implementing mitigation measures, the project can be carried out with reduced environmental impacts, ensuring the sustainable development of the facility.

10.3 Assessment of impacts for the construction phase

Overview

The physical development and establishment of the facility are done during the construction phase of a lithium processing plant to get it ready for use. As it establishes the groundwork for the facility's successful operation, it is a crucial time in the establishment of a lithium processing plant. It is an important phase in the project's life cycle and necessitates careful preparation, execution, and adherence to environmental and safety requirements. During the screening and assessment phases, the Environmental Practitioner evaluated and identified environmental elements and potential impacts after consulting with relevant authorities, IAPs, and the environmental team. A lithium processing plant's building phase will have a number of environmental implications that must be taken into account and reduced to the extent possible. The following are some of the major environmental impacts: habitat loss and fragmentation, soil erosion and sedimentation, air quality effects, noise and vibration, water consumption, waste generation, chemical and fuel spills, traffic and transportation effects, and visual effects.

Positive impacts during construction

The construction of a processing facility to produce a lithium concentrate in a developing nation like Namibia can have a number of favorable effects and can bring about favorable economic growth. It is however critical to remember that in order to optimize the positive benefits of the processing plant, good management, environmental care, and adherence to social and environmental norms are required. Cooperation between the governmental, private, and local communities is essential for the benefits of the processing facility to be inclusive and sustained. Some of the most significant advantages are:

- Economic Development and Job Opportunities: The building and running of the processing facility will lead to the creation of jobs for both skilled and unskilled laborers. This will result in higher income levels and lower unemployment rates, improving the local communities' general economic well-being.
- Foreign Direct Investment (FDI): The establishment of a lithium concentrate processing facility might draw in overseas investors and encourage FDI in the nation. This influx of cash has the potential to boost economic development and broaden the nation's industrial base.
- Opportunities for revenue generation and export: Lithium concentrate processing and export could result in significant revenue for the nation. Lithium concentrate sales on the global market can boost a nation's foreign exchange profits.
- Industrial Development and Diversification: The construction of a lithium processing facility may promote the nation's industrial growth. It might draw associated businesses, like battery production and renewable energy technologies, promoting technological advancement and economic diversification.
- Improved Infrastructure: The construction of a processing plant may call for the extension and enhancement of existing infrastructure, such as roads, water supplies, and energy grids. For surrounding towns, this may result in improved accessibility and living circumstances.

- Technology Transfer and Skill Development: Lithium processing technology can encourage knowledge sharing and technology transfer. The local workforce's capacity and skill growth as a result could improve the human capital of the nation.
- Positive Social Impact: The processing plant's revenue can be used to fund social development initiatives like community infrastructure, healthcare, and educational initiatives. The population's general quality of life and wellbeing may be enhanced by this.
- Regional Development and Investment: A lithium processing facility may draw capital to the area. This might result in the rise of support industries and the formation of industrial clusters, which would improve the business climate.

Negative Impacts during construction

The construction phase is a critical period in the development of a lithium processing plant, as it lays the foundation for the successful operation of the facility. Careful planning, adherence to environmental and safety standards, and effective project management are essential to ensure a smooth and efficient construction process. During the construction phase of a lithium processing plant, several environmental impacts need to be considered and mitigated to minimize their adverse effects on the surrounding environment. Identified key environmental impacts are given below:

10.3.1 Habitat destruction and fragmentation

Any use of land transformation results in the loss of site-specific biodiversity, habitat fragmentation, reduction of intrinsic functionality, and reduction of the role that undeveloped land plays as a link between various places of biodiversity importance. Clearing vegetation and levelling the land for site preparation can result in the destruction and fragmentation of habitats. This can displace local wildlife and disrupt ecological balance in the area. Physical disturbance, ongoing human presence, and prolonged human use will cause the modification. The assessment of biodiversity considers how people affect the local flora and fauna. The integrity of baseline

biodiversity as well as the biological productivity of the site and the near vicinity are at risk due to some project activities like moving vehicles, moving people, and excavation.

Dust, gaseous emissions, and airborne particles will be created and deposited on plants. The physiological processes of plants, particularly those near the project site like photosynthesis and respiration, will undoubtedly be impacted by this. These suggest that some plants might develop more slowly while others might be removed. The project area's surrounding natural vegetation appears to be unaltered. Most of the land lacks vegetation, with some minor exceptions along river systems. The project can have a negative effect on some vegetation species in the vicinity.

The excavation for establishing the foundations of various components of the processing plant may result in land degradation and habitat loss. The majority of the affected species are endemic because even minor changes to their habitat might put them at a very high risk of survival. The proponent must make sure that none of the employees capture, hurt, or kill any animals. Wildlife poaching must be strictly avoided because it is illegal, and anyone found engaging in it risks being fired from the project and prosecuted. If caution is not exercised, it is feared that workers may disturb birds or nests on sites. The Ministry of Environment, Forestry, and Tourism should be notified if any of the staff members come across bird nesting sites for species of endangered avifauna, such vultures.

Table 7 Qualitative impact assessment for habitat destruction and fragmentation.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**M**	**L**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation measures

1. Site Selection and Design: Choosing a location that minimizes impacts on sensitive ecosystems and habitats, avoiding areas with high biodiversity will lessen environmental damages. Establishing a lithium processing plant requires careful consideration during the site selection and design stages. It entails locating and assessing suitable plant locations as well as planning

the infrastructure and layout of the building. Optimizing the plant's design to reduce its footprint and avoid fragmentation of significant wildlife corridors is of essence.

Important Considerations in the selection of site:

- Access to Raw Materials: When choosing a location, lithium-rich ore resources nearby are a key factor. Locating your business close to high-quality lithium sources will save you money on transportation and provide a steady supply of raw materials.
- Infrastructure and Transportation: The effective delivery of raw materials to the factory and the distribution of the finished product depend on access to dependable transportation channels, such as highways, trains, and ports.
- Water Availability: Water is used extensively during the production of lithium, therefore having access to a dependable and sustainable water source is crucial. It is crucial to evaluate the quantity and quality of water supplies.
- Environmental Considerations: Evaluate the site's possible effects on the environment, considering habitat sensitivity, air quality, water quality, any protected areas, and other ecologically important characteristics. Reduce effects on delicate ecosystems by carefully arranging your site.

Plant design:

The design of the lithium processing plant is the next phase after the site has been chosen. In the design process, important components include:

- Waste Management and Tailings Facilities: Create systems for managing waste that can deal with the by-products and tailings produced during the operations which considers necessary precautions to protect the environment.
- Utilities and Services: Include necessary utilities in the plant's design, such as systems for waste disposal, water supply, power distribution, and heating, ventilation, and air conditioning.
- Environmental Compliance: Ensure that environmental management plan and pollution control strategies are incorporated into the plant's design to reduce its ecological imprint and adhere to environmental requirements.

Benefits of effective site selection and design:

- Operational Efficiency: A well-planned site layout and design improve the plant's operational efficiency by cutting down on transportation distances and streamlining production procedures.

- Resource Optimization: By strategically choosing a site, natural resources like water and energy may be used more effectively, cutting down on waste and operating expenses.
- Environmental Stewardship: Careful site selection and design that takes into account environmental aspects reduces the plant's environmental effect and encourages sustainable
- Regulatory Compliance: Following regulations while choosing a site and designing a project lowers the possibility of delays or legal issues and guarantees a smooth approval procedure.

2. The following measures must be made to mitigate future impacts on flora

- As much as is practically possible, the footprint of the area to be disturbed will be minimized.
- Before beginning the development activities, remove special fauna and delicate fauna and, if possible, relocate to a less delicate/disturbed site.
- The amount of disturbed regions must be minimized. Only the current tracks should be used, and off-road driving should be prohibited.
- Before beginning the development activities, remove special fauna and delicate fauna and, if possible, relocate to a less delicate/disturbed site.
- Suggest using native plants in the landscaping rather than exotic ones because they require less upkeep and perform crucial ecological tasks like sequestering carbon from decomposing materials at the same time.
- Where it is obvious that some major species will be eliminated, consideration should be given to proposing to rescue the individuals involved and relocate them to nearby gardens.
- Disturbance of marginal vegetation in the highlands should be limited.
- The protected and indigenous species should be reintroduced in the region, and where possible, removed plants should be transplanted or replaced with new plants.

3. Enforceable mitigation measures for fauna

- Adhere to the terms outlined in the site-access contracts, particularly as they pertain to the regions used for professional hunting. The delicate hunting season needs to be considered specifically.
- Please Don't disturb the invertebrates in the area or along the gravel road stretch.
- Prevent the development of several road strips, which may disturb the locations where different mammals reproduce.
- If the necessity arises, a fauna survey will be carried out to assess the impact of fragmented habitat on game species.
- Care will be taken to make sure there isn't any rubbish laying about because wild animals might eat it.
- No employee shall be allowed to hunt, snare, or take any wild animal in any other way.
- Observed bird deaths and nest removal should, whenever possible, be documented in a biodiversity data-base and made public.

Monitoring

- Consistent monitoring of any unexpected signs in an animal's habitat.

10.3.2 Air Quality Impacts during Construction

During the construction of a lithium processing plant, certain activities can have temporary air quality impacts which can lower air quality in the vicinity. Dust emissions may contain harmful substances, such as heavy metals, affecting both human health and the environment. These impacts mainly arise from earthmoving, construction machinery, and material handling. Here are some key air quality impacts during the construction phase:

1. Dust and Particulate Matter: Construction activities, such as excavation and material transportation, can create dust and particulate matter. When the wind carries this dust, it can reduce air quality and affect nearby communities. Dust may be might be aggravated during the winter months when strong winds occur (>10 m/s).
2. Vehicle Emissions: Trucks and excavators used in construction produce pollutants that cause short-term air pollution. Carbon dioxide (CO2), carbon monoxide (CO), hydrocarbons, oxides of nitrogen (NOx), sulphur, and PM10 are among the contaminants found in vehicle exhaust. Lead, cadmium, and nickel, among other toxic trace metals, are also present in minute

quantities. The kind and quantity of gasoline used, engine size, vehicle speed, and the amount of abatement technology installed all affect how much of each pollutant is released. The contaminants are diluted and diffused in the surrounding air after being released. Due to field vehicles' installation of adequate exhaust filters, pollution from vehicle burning of hydrocarbons is less of a worry.

3. Construction Materials: The use of construction materials like cement and asphalt can release volatile organic compounds (VOCs) during curing, which can impact air quality.

Workers' inhalation of dust produced and air pollutants suspended in the air may cause respiratory illnesses. Pneumoconiosis, chronic obstructive pulmonary disease (CODP), and lung cancer are the main respiratory conditions linked to inhaling mineral dust. It should be highlighted, nonetheless, that lengthy and continuous exposure to mineral dust is not anticipated given the size and nature of the proposed project. The flora is also affected by the dust produced and fume emissions, not only humans. Long-term photosynthesis and transpiration rates are expected to be impacted by the fallout dust that settles on vegetation. The accumulated dust on plant leaves may have an impact not only on the operation of the vegetation, but also on livestock that eat the vegetation. The project should, whenever possible, avoid, minimize, and control

Table 8. Qualitative assessment of air quality impacts.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**L**	**M**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures during Construction:

Implementation of mitigation measures during the construction phase, the project can minimize its temporary impact on air quality, ensuring a healthier environment for both workers and nearby residents. Potential air quality impacts, such as emissions from construction operations, were assessed, and measures were implemented to control emissions and maintain compliance with air quality standards.

To minimize air quality impacts during the construction phase, the project can implement several mitigation measures:

- Dust Control: Use water sprays and cover exposed areas to suppress dust during construction activities, reducing its spread to surrounding areas. The proponent must decide whether to halt construction under extreme wind conditions until the wind has subsided.
- Vehicle Management: Maintain construction vehicles properly to minimize emissions and schedule deliveries during off-peak hours to reduce congestion and air pollution. Establishing a routine maintenance and repair schedule for vehicles
- Alternative Materials: Consider using eco-friendly and low-VOC construction materials to reduce emissions during curing.
- Work Practices: Encourage best practices among workers, such as reducing idling times for machinery and vehicles, to minimize air quality impacts. Use of additional required PPE (gloves, work suits, sun hats, etc.) and personal protective equipment (PPE) for effective dust control and respiratory protection.
- Community Communication: Keep the local community informed about construction activities, potential air quality impacts, and mitigation efforts to address any concerns they may have.

<u>Monitoring</u>

- Daily inspection of the transportation routes and dust prone areas to ensure that mitigation measures are in place.
- Daily inspection on site all workers in dust prone areas are wearing their protective clothes.
- Installation of dust receptors in and around the construction site for purposes of dust generation monitoring.

10.3.3 Noise and Vibration during Construction

Any disruptive or unwelcome sound that obstructs or endangers people or wildlife is considered noise pollution. Numerous negative impacts on a person's bodily and mental health result from ongoing noise exposure. Tinnitus, noise-induced hearing loss (NIHL), decreased performance, trouble sleeping, conversational disruption, annoyance or tension, anxiety, sadness, and high blood pressure are a few of these impacts. Workers are not permitted to operate in environments with noise levels that are 85 dB or higher per 8 hours, according to ISO 18001 guidelines. Animal species are negatively impacted by noise pollution because it degrades habitat quality, raises stress levels, and muffs other sounds.

During the construction phase of the processing plant, certain activities and equipment can generate noise and vibration that may affect nearby communities. These impacts can be bothersome and disruptive to residents' daily lives if not properly managed. Let's delve into the details of these impacts and how they can be mitigated:

1. Noise Disturbance:
Construction activities involve heavy machinery, such as excavators, bulldozers, and trucks, which can generate loud noises. The constant noise from these machines can be irritating and disturb the peace and quiet in the surrounding area. Prolonged exposure to high levels of noise can also lead to stress and affect the well-being of nearby residents, including their sleep patterns and overall quality of life.

2. Vibrations:
Large construction equipment, particularly when operating close to the ground, can generate vibrations that travel through the soil. These vibrations might be felt by people living in nearby buildings or houses. If the vibrations are intense or frequent, they can cause discomfort and unease, especially if they persist for an extended period.

Table 9: Qualitative assessment of noise and vibration impact.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**L**	**M**	**L**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L/M**	**L**

Mitigation measures for noise and vibration during the construction phase:

If mitigation measures are implemented, the project will demonstrate consideration for the environment during the construction phase. Proactive efforts to manage noise and vibration impacts contribute to a more harmonious relationship between the project and the receiving environment. To reduce the impact of noise and vibration during the construction phase, the following mitigation measures can be implemented:

- Using quieter equipment: Employ modern, quieter machinery and equipment to minimize noise levels during construction activities. Choose equipment with lower noise emissions and vibration characteristics.
- Scheduling work wisely: Plan construction activities during less sensitive hours, avoiding early mornings, late evenings, and weekends when people are more likely to be at home or trying to rest.
- Noise barriers and enclosures: Erect noise barriers or enclose construction equipment to contain noise within the construction site and limit its spread to surrounding areas.
- Monitoring and adjustment: Regularly monitor noise levels and vibrations during construction. If noise levels exceed acceptable limits, consider adjusting work practices or using additional noise reduction measures.
- Compliance with regulations: Ensure that all construction activities adhere to local regulations and guidelines concerning noise and vibration limits.
    - According to ISO 18000, noise levels for employees working an 8-hour shift shouldn't be greater than or equal to 85dBA.
    - Workers working near high noise machinery and vehicles should be provided with ear protection equipment such as ear muffs and earplugs.
    - Safe minimum distance from noise generating activities should be introduced.
    - Horns/hooters as a general communication tool should not be allowed, but use it only where necessary as a safety measure.

Monitoring

To determine the current ambient noise levels in the vicinity of the proposed project during construction, noise monitoring may be done. Programs for noise monitoring must to be developed and implemented by qualified professionals. The kind of acoustic indices that are recorded is determined by the kind of noise that is being monitored, according to a noise specialist. To ensure that the noise levels at the site do not exceed permitted limits, noise levels should be continuously monitored.

10.3.4 Water Consumption during Construction

During the construction phase of a lithium processing plant, water is an essential resource needed for various activities and processes. Construction activities can have a significant impact on water consumption, both in terms of volume and potential environmental implications. Let's explore how water is used during construction and ways to manage its consumption:

Water Uses during Construction:

- Dust Suppression: Water is often used to control dust during construction, particularly in dry and dusty environments. Spraying water on construction sites can help prevent dust from becoming airborne and spreading to surrounding areas.
- Concrete Mixing and Curing: Construction activities often involve mixing concrete for foundations, structures, and infrastructure. Water is a crucial component in the concrete mixing process, and it is also used for curing concrete to ensure it gains strength properly.
- Material Processing: Water might be required for the processing and beneficiation of raw materials used in construction. For example, it can be used in the washing and separation of ores to extract the desired lithium-rich materials.
- Worker Amenities: Providing water for workers' amenities, such as drinking water, sanitation facilities, and washing stations, is vital to ensure a safe and healthy working environment.

- Equipment Cooling: Some construction machinery and equipment require water for cooling purposes to prevent overheating during continuous operation.

Managing water consumption:

Given the importance of water during construction and its potential impact on local water resources, it is essential to manage water consumption responsibly:

- Water-efficient practices: Adopt water-efficient construction practices, such as using recycled water when possible and optimizing water usage in concrete mixing and curing processes.
- Rainwater harvesting: Consider rainwater harvesting systems to collect and store rainwater for non-potable uses, such as dust suppression and equipment cooling.
- Water recycling and treatment: Explore opportunities for recycling and treating water on-site to reduce the demand for fresh water and minimize the environmental footprint.
- Water monitoring: Implement a water monitoring program to track water consumption during construction. Regular monitoring allows for early detection of any excessive water usage and enables timely corrective actions.
- Community engagement: Engage with local communities to understand their water needs and concerns. Collaborating with local stakeholders can help identify opportunities for sustainable water management practices.
- Compliance with regulations: Ensure compliance with all relevant water regulations and permits. This includes obtaining necessary permits for water use and discharge to protect water resources and ecosystems.

10.3.5 Groundwater and surface water contamination

During the construction phase of a lithium processing plant, there is a risk of groundwater and surface water contamination due to various activities and potential spillages. Groundwater and surface water are valuable resources that support ecosystems and provide drinking water for nearby communities. It is crucial to implement measures to prevent contamination and protect these vital

water sources. Chemicals such heavy metals, organic solvents, oils, microbiological pollutants, and effluent discharge may be the principal contaminants in groundwater and surface water. These toxins could seep into the earth and contaminate the nearby aquifer through faults or fractures, and over time, they could spread to other groundwater systems in the region.

In order to prevent subsequent releases and their associated negative effects, the cause of any uncontrolled leak that results in land contamination during any project phase should be found and fixed. In order to reduce the risk to human health and ecological receptors, contaminated lands should be handled. Reducing contamination levels at the site while limiting human exposure to contaminants is the ideal method for decontaminating land.

Storm water is another source of water contaminant. Any surface runoff and flows brought on by precipitation, drainage, or other causes are referred to as storm water. Surface water contamination can result from stormwater runoff from construction projects picking up contaminants including silt, debris, and building materials and transporting them into surrounding streams or rivers. Rapid runoff, even from uncontaminated storm water, erodes stream banks and beds, lowering the quality of the receiving water. The volume and footprint of the activities where potential sources of pollution are expected to occur, should however, should be taken into consideration as being relatively minor. Due to the somewhat modest impact, groundwater must nonetheless be safeguarded because it is a valuable resource. The proponent has outlined numerous steps to guarantee the protection.

Table 10. Qualitative impact assessment of surface and groundwater.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M/H**	**M**	**M/L**	**H/M**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures to be enforced:

- No disposal of waste products of any type in or near surface water bodies or potential groundwater recharge sites.
- Non-toxic and biodegradable lubricant will be utilized.

- Wastewater and contaminated water should be controlled for proper disposal and should not be released into the environment.
- Project machinery and equipment as well as vehicles not in use should have drip trays underneath to catch any potential oil leaks.
- Spill kits will be readily available on site, and all vehicle maintenance and refueling will be done on impermeable surfaces. In order to control and address pollution accidents, workers and/or contractors will be taught on how to use the spill kits.
- During orientation, emphasize environmental awareness for both contractors and employees.
- Accessibility to equipment for spill prevention and response, which should always be visible to and available to all employees.
- Obtain a spill response action plan in the event of an accident, and any spills will be cleaned up right away to the satisfaction of the environmental manager by removing the spillage and the contaminated soil and by disposing of them at a recognized facility as specified in the spill response action plan.
- On-site designated waste collection tanks must be located far from waterways, and this isolation must always be maintained.

Monitoring

Implement groundwater monitoring wells around the construction site to assess any potential impacts on groundwater quality.

10.3.6 Waste generation and management during construction

During the construction of a lithium processing plant, various activities generate waste materials that need proper management to minimize environmental impact and ensure a safe working environment. In order to encourage sustainable construction methods and cut down on the amount of garbage sent to landfills, waste management is essential. Contractors, employees, and other visitors to the area may produce waste. utmost of the site's personnel and contractors must give their utmost to proper solid waste management. If the solid waste produced by this project is not controlled, it will have an impact on the environment.

Waste of all kinds, including hazardous waste, normal industrial waste, and home waste, may be produced during construction. Prior to being removed and eventually disposed of at authorized trash disposal facilities, domestic waste will be processed and stored on site for a brief period of time. To get rid of all the hazardous material on the property, a licensed waste management

company would be hired. Additionally, restrooms will have sealed septic tanks, chemical toilets, or both, with regular trips to the Uis village for sewerage disposal.

Below are waste generation sources:

1. Construction debris: Construction activities generate debris, including concrete, wood, metal scraps, packaging materials, and other construction-related waste.
2. Excavated materials: The excavation of soil and rocks produces large amounts of excavated material, which may need proper disposal or reuse.
3. Hazardous waste: Construction sites may produce hazardous waste, such as paint, solvents, adhesives, and construction chemicals, which require specialized handling and disposal. All chemicals and other hazardous substances must be stored and maintained in accordance with the Hazardous substances ordinance (No. 14 of 1974), with all relevant licences and permits to be obtained where applicable.
4. Packaging materials: Materials delivered to the construction site, such as equipment, machinery, and materials, often come with packaging that needs proper disposal.

Table 11. Qualitative impacts assessment for waste management.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**L**	**H**	**L**	**M**	**M**	**L**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Effective waste management measures:

By prioritizing waste management during the construction of the plant, the project can contribute to a cleaner environment, support resource conservation, and promote responsible construction practices for the benefit of all stakeholders. To manage waste responsibly during construction, the following measures can be implemented:

- Waste segregation: Encourage workers to segregate waste at the source to separate recyclable materials from non-recyclables and hazardous waste.
- On-site recycling: Implement on-site recycling programs to reuse materials like concrete and metal scraps, reducing the volume of waste sent to landfills.

- Hazardous waste Handling: Handle hazardous waste according to strict regulations, ensuring proper storage, labeling, and transportation to licensed disposal facilities.
- Waste minimization: Emphasize waste reduction through proper planning and material estimation, avoiding excessive orders that may result in waste.
- Waste collection Points:
    - Set up designated waste collection points on the construction site to facilitate easy waste disposal and segregation by workers.
    - Suitable receptacles for waste disposal should be provided at appropriate locations on site. These receptacles be clearly marked for different waste types.
    - The project site should be equipped with separate waste bins for general/domestic waste and hazardous waste.
    - The collected solid waste should be disposed at registered and approved disposal site agreed upon by both Municipality and the proponent.
    - Strictly, no burning of waste on the site or at the disposal site, as it possesses environmental and public health impacts.
- Contractor education: Educate contractors and workers on the importance of waste management and the implementation of waste reduction practices.

10.3.7 Traffic and transportation impacts during construction

The construction of a processing plant can have significant impacts on traffic and transportation in the surrounding area. The movement of construction vehicles, road closures, and changes in traffic patterns can disrupt normal commuting routes and affect the overall transportation system. It is essential to proactively address these impacts to ensure the smooth flow of traffic, promote safety, and minimize inconvenience to the community. Construction activities necessitate the movement of heavy machinery, materials, and equipment to and from the site. This influx of construction traffic can lead to congestion on local roads and highways, affecting the regular flow of vehicles.

Effective traffic and transportation management measures:

By prioritizing effective traffic and transportation management during construction, the project can demonstrate its commitment to safety, sustainability, and community well-being, creating a positive impact on the on the receiving environment throughout the construction phase. To manage traffic and transportation impacts during construction, the following measures can be implemented:

- Traffic impact assessment: Conduct a comprehensive traffic impact assessment before construction begins to identify potential issues and devise appropriate mitigation measures.
- Traffic management plans: Develop detailed traffic management plans to manage construction-related traffic, including detours, road closures, and signage.
- Alternative routes and notifications: Provide information about alternative routes and construction schedules to the public through clear signage and community notifications.
- Construction vehicle management: Monitor construction vehicle movements and enforce speed limits to ensure safe interactions with other road users.
- Community engagement: Engage with the local community to gather feedback, address concerns, and provide regular updates on construction progress and traffic management efforts.

10.3.8 Visual impact during construction

The construction of a lithium processing plant can have significant visual impacts on the surrounding landscape and the aesthetic appeal of the area. The sight of construction activities, equipment, and temporary structures may alter the natural beauty and visual harmony of the environment. Construction damages the ecology and reduces the area's overall appeal, which has a negative visual effect. The C35 and D2342 road, which is used by locals and tourists alike, is 20

kilometers away from the project. Since they are so focused on snapping pictures of the scenery, it is believed that tourists have extremely sensitive visual sensors. It is essential to address these visual impacts to maintain the scenic quality of the area and ensure that the project aligns with the community's visual expectations. Here are the key visual impacts and ways to address them:

- The presence of large construction equipment and machinery can be visually intrusive, especially in areas with natural landscapes or scenic views. The sight of construction vehicles and temporary structures may disrupt the visual serenity of the surroundings.
- During construction, dust and debris generated by activities like earthmoving and excavation can temporarily obscure the landscape, affecting the clarity of views and visual enjoyment.
- Construction sites often require the installation of temporary structures, barriers, and fencing for safety and security. While necessary for construction operations, these structures can be visually unappealing to the community.
- The construction of tall structures, such as storage tanks or processing facilities, may alter the skyline and change the visual character of the area.

Table 12. visual impacts impact evaluation.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**L**	**M**	**L**	**M**	**M**	**L**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Effective Visual Impact Mitigation Measures:

To manage visual impacts during construction, the following measures can be employed:

- Use natural or artificial screening and landscaping to minimize the visibility of construction equipment and temporary structures from public viewpoints.
- Implement effective dust control measures to reduce airborne dust and debris, maintaining clear views and reducing visual disturbances.
- Use minimum and informative construction signage to avoid visual clutter and maintain a clean aesthetic during construction.
- Consider the appearance of temporary structures, such as fences and barriers, and use materials and colors that complement the surroundings.

- After construction is complete, engage in revegetation and restoration efforts to restore the landscape to its original or improved condition.
- Properly manage nighttime lighting to minimize light pollution and glare that may impact the nocturnal visual experience.
- Care must be made to ensure that all restored areas resemble the surrounding area in terms of visual character, vegetation cover, and terrain, and that any unfavorable visual consequences are remedied to the environmental consultant's satisfaction.
- Minimize topsoil disturbance, preserve existing trees, and add native plants to encourage re-vegetation.
- As part of the restoration procedure, overburden will be reinserted into the excavation.
- Keep off-road equipment and vehicles inside the approved area.
- Excavations, vehicle footprints, and land markings must be returned as much as possible to their former visible and physical states.

10.3.9 Occupational Health, Safety, and Security during Construction:

Ensuring the health, safety, and security of workers and personnel during the construction of a lithium processing plant is of utmost importance. Construction sites can be hazardous environments, and proactive measures must be taken to prevent accidents, protect workers' well-being, and safeguard valuable assets.

Table 13. Impact evaluation for occupational health, safety and security.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**M**	**M**	**M**	**M**
Mitigated	**L**	**L/M**	**L**	**L**	**L/M**	**L**

Here are the key aspects and details concerning occupational health, safety, and security during construction:

- Conduct health assessments for workers before they start their tasks to identify any pre-existing health conditions that could affect their work or safety.
- Provide adequate facilities for personal hygiene, including clean drinking water, sanitation, and areas for handwashing.

- Establish onsite medical aid facilities and ensure trained personnel are available to handle medical emergencies promptly.
- Implement proper protocols for the safe handling and storage of hazardous materials, ensuring workers' exposure to harmful substances is minimized.
- Regularly monitor workers' health to identify and address any emerging health issues related to their work environment.
- Conduct thorough risk assessments to identify potential hazards at the construction site and implement measures to mitigate these risks.
- Ensure that all workers wear appropriate PPE, such as helmets, safety goggles, gloves, and safety footwear, to protect them from potential injuries.
- Provide comprehensive training to workers on construction site safety, emergency procedures, and the proper use of equipment and tools.
- Implement fall protection measures, such as guardrails and safety harnesses, to prevent falls from heights.
- Regularly inspect and maintain construction equipment to ensure they are in safe working condition.
- Implement traffic control measures to protect workers from vehicle-related accidents within the construction site.
- Control access to the construction site to prevent unauthorized entry and protect valuable materials and equipment.
- Install security cameras and conduct regular monitoring to deter theft and vandalism.
- Employ trained security personnel to patrol the construction site and respond to any security breaches.
- Securely store construction materials to prevent theft or damage.
- Implement robust cybersecurity measures to protect sensitive data and prevent cyber threats.

10.4 Assessment of Impacts for the operation phase

10.4.1 Overview

During the operation phase of a lithium processing plant, the focus shifts from construction and development to the actual production and processing of lithium ore. This phase is a critical stage of the project where the plant is fully operational, and the production processes are fine-tuned to efficiently extract and concentrate lithium from the raw materials. Overall, the operation phase of a lithium processing plant is a crucial stage where the emphasis is on efficient and responsible production while ensuring the well-being of workers, the environment, and the surrounding communities. It requires careful monitoring, continuous improvement, and a commitment to sustainable practices for long-term success.

1) Commencement of Operations: At the start of the operation phase, all necessary permits and licenses are in place, and the plant has undergone thorough testing and commissioning to ensure it operates safely and efficiently. The production team, along with trained personnel, takes over the plant's operation.

2) Ore Extraction and Processing: The primary activity during the operation phase is the extraction of lithium-rich ore from the mine. The ore is transported to the processing plant, where it undergoes various stages of crushing, grinding, and beneficiation to produce lithium concentrate. Specialized machinery and equipment are utilized to handle the ore efficiently and minimize environmental impacts.

3) Environmental Monitoring and Compliance: Environmental monitoring is a key component during the operation phase. The plant must comply with the environmental management plan (EMP) and all regulatory requirements. Regular monitoring of air quality, water quality, noise levels, and other environmental factors ensures that the plant's operations do not negatively impact the surrounding ecosystem.

4) Health and Safety Measures: Occupational health and safety remain a top priority throughout the operation phase. The plant implements strict safety protocols to protect its workers from potential hazards and accidents. Regular safety training and emergency preparedness drills are conducted to ensure a safe working environment.

5) Waste Management: The operation phase generates various types of waste, such as tailings, process residues, and solid waste. Proper waste management practices are put in place to handle and dispose of these materials responsibly, following all environmental guidelines and regulations.

6) Product Quality Control: Maintaining product quality is crucial for the success of the lithium processing plant. Rigorous quality control measures are implemented at every stage of the processing to ensure that the final lithium concentrate meets the required specifications and standards.

7) Continuous Improvement: The operation phase provides an opportunity for continuous improvement. The plant's operators closely monitor the process performance and efficiency, seeking ways to optimize operations, reduce energy consumption, and minimize waste generation.

8) Stakeholder Engagement: Stakeholder engagement remains an essential aspect during the operation phase. The plant continues to interact with local communities, regulatory bodies, and other stakeholders to address any concerns, share information, and maintain a positive relationship.

9) Sustainable Practices: The operation phase emphasizes sustainable practices. Efforts are made to minimize the plant's ecological footprint and promote resource conservation. Initiatives like water recycling, energy efficiency measures, and biodiversity conservation are integrated into the plant's operations.

10) Periodic Reviews and Reporting: Regular reviews and reporting are conducted during the operation phase to assess the plant's performance, environmental impact, and compliance with the EMP. Reports are submitted to regulatory authorities and stakeholders, demonstrating transparency and accountability.

<u>Positive impacts during operation phase</u>

- Creating jobs and improving lives: When the lithium processing plant starts operating, it provides job opportunities for people in the local communities. It means a chance for skilled and unskilled workers to find work and support their families, bringing hope and stability to their lives.
- Boosting the local economy: With the plant generating revenue from selling lithium concentrate, the entire region experiences an economic boost. This means more funds for essential services like schools, hospitals, and other community needs.
- Paving the way for green energy: The lithium concentrate produced plays a vital role in making electric vehicles (EVs) and renewable energy storage possible. By supporting these sustainable technologies, we're taking steps toward a cleaner, greener future for our planet.
- Caring for the community: Responsible mining companies take their role seriously. They invest in the local community by supporting education, healthcare, and clean water initiatives. It's about giving back and making sure everyone benefits from the project.
- Protecting nature: During the operation phase, everyone keeps a close eye on the impact on the environment. The Environmental Management Plan (EMP) guides us to ensure we're doing our best to protect the natural world and conserve biodiversity.
- Building better infrastructure: The presence of the plant brings improvements to the area. Better roads, power networks, and water systems are built, making it easier for people to get around and access essential services.
- Engaging with our neighbors: The company believes in open communication with the communities around them. They listen to concerns, answer questions, and involve locals in decisions that affect their lives.
- Nurturing our planet: Water is precious, so extra care is taken to manage it responsibly. Water is recycled and reused to minimize the impact on local sources and ensure everyone has access to this essential resource.
- Keeping our wildlife safe: The company understands the importance of protecting the local flora and fauna. Steps are taken to restore habitats and safeguard the unique biodiversity in the area.
- Leaving a positive legacy: The goal is to leave a lasting impact long after the plant is gone. By balancing business needs with the well-being of people and the planet, the aim is to create a legacy that benefits future generations.

In the end, the operation phase is not just about profits and business; it's about making a positive difference in people's lives and caring for our environment. Working together and being responsible, can build a brighter and more sustainable future for everyone.

<u>Negative impacts during operation phase</u>

- Disturbing Our Quiet Spaces: The operation phase of the lithium processing plant can bring noise and activity to once-peaceful areas. For some local residents, this might disrupt their tranquil living environment and affect their daily lives.
- Traffic Troubles: Increased traffic in the region due to the plant's operations can lead to congestion on local roads. For those who have been used to peaceful commutes, the added traffic can be frustrating and time-consuming.
- Concerns About Water: Some community members worry about water usage during the operation phase. They fear that the plant's water needs might affect local water sources and availability for farmers and households.
- Air Quality Concerns: With the plant's machinery and processes, there might be concerns about air pollution. People worry about the impact on their health and the environment, particularly for those with respiratory issues.
- Wildlife Disruptions: The operation phase might encroach on wildlife habitats, leading to displacement of certain animal species. This can be distressing for those who value the local biodiversity and wildlife.
- Waste and Disposal: The plant's operations generate waste, and there are concerns about how it will be managed. People worry about the potential environmental impacts and proper disposal of waste materials.
- Uncertainty for Livelihoods: Some local communities rely on traditional livelihoods like farming or fishing. They worry that the plant's presence might disrupt their way of life and affect their income and livelihoods.
- Visual Changes: The physical appearance of the area might change during the operation phase. For those who cherish the natural landscape, this alteration can be disheartening.
- Safety Concerns: The operation phase involves heavy machinery and industrial processes. There are concerns about safety risks for workers and the community, especially if proper safety measures are not in place.
- Fear of Chemical Exposure: Some residents worry about potential exposure to chemicals used in the processing plant. They fear the health risks associated with such exposure and want assurance of safety measures.

It's important to remember that while the operation phase can bring negative impacts, responsible management and collaboration with the community can help address these concerns. By actively listening to local residents, implementing effective environmental measures, and promoting open dialogue, we can work together to find solutions and create a more sustainable and harmonious operation phase.

10.4.2 Noise and vibration impact during operation phase

The operation of heavy machinery, processing equipment, and transportation can generate noise and vibrations that may disrupt the tranquility of the area and impact wildlife and nearby communities. This can lead to disturbances for nearby communities, affecting their peace and tranquility. Excessive noise can cause stress, disrupt sleep patterns, and impact overall well-being, particularly for those living in close proximity to the plant.

Table 14. Qualitative assessment of noise and vibration impact.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	M	L	M	M
Mitigated	L	L	L	L	L/M	L

Mitigation Measures:

- Invest in quieter processing equipment and modern noise reduction equipment to minimize noise emissions and ensure a quieter operation.
- Conduct regular maintenance to ensure machinery operates at reduced noise levels, mitigating disturbances.
- Installation of noise barriers and sound-absorbing materials around processing areas to limit noise propagation to nearby communities.
- Schedule noisy activities during times that have the least impact on nearby communities, such as avoiding nighttime operations.
- Conducting regular noise level monitoring to ensure compliance with set standards.
- Addressing any complaints from nearby communities promptly and taking necessary steps to minimize disturbances.

Monitoring:

- Regular noise level measurements at various points around the processing plant to assess compliance with noise standards.

- Ongoing feedback from residents to address any noise-related concerns and take necessary corrective actions.

10.4.3 Traffic congestions and safety during operation

The operation phase may result in increased traffic movement in and around the processing plant, leading to congestion on local roads and potential disruptions for nearby communities. Heavy traffic can raise safety concerns for pedestrians and other road users, while increased road wear and tear may impact local infrastructure.

Mitigation Measures:

- Collaborate with local authorities to manage traffic flow during peak hours and reduce congestion.
- Encourage employees to carpool or use public transportation to reduce the number of vehicles on the road.
- Implement traffic management plans to ensure smooth flow in and out of the plant premises and minimize traffic disruptions.

Monitoring:

- Regular traffic flow assessments during peak hours to identify potential bottlenecks and implement necessary improvements.
- Solicit feedback from the community on traffic-related issues and actively address their concerns.

10.4.4 Water consumption and contamination during operations

The processing plant's water consumption and discharge may raise concerns about the availability and quality of water resources in the surrounding area, affecting both human and ecological needs. Water scarcity can impact local communities' access to clean water, while improper water discharge can lead to pollution and harm aquatic ecosystems. There is also a risk of water contamination from spills or leaks of hazardous substances.

Table 15. Qualitative impact assessment of surface and groundwater.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M/H**	**M**	**M/L**	**H/M**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures:

- Implement water recycling and treatment systems to minimize water usage and conserve this vital resource. (No chemicals will be used, water from both the plant and living quarters will be recycled).
- Promote responsible water management practices throughout the operation phase to avoid wasteful practices.
- Conduct regular leak detection and repair programs to prevent water wastage and conserve water resources.
- Proper storage and handling of chemicals to prevent water contamination (no chemicals to be used for processing, waste water to be recycled).
- Regular water quality monitoring to detect any potential contamination and take prompt corrective actions.

Monitoring:

- Regular water quality monitoring to ensure compliance with environmental standards and prevent water pollution.
- Monitoring of water consumption levels and comparison against sustainable targets.
- Regular water quality monitoring to detect any potential contamination and take prompt corrective actions.

10.4.5 Air pollution during operations

The operation phase may result in air emissions from various processes, potentially leading to air quality concerns for nearby communities and sensitive ecosystems. Poor air quality can have adverse health effects on residents, especially those with respiratory conditions.

Table 16. Qualitative assessment of air quality impacts.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**L**	**M**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures:

- Adopt advanced emission control technologies to minimize air pollutants and reduce the plant's environmental footprint.
- Conduct regular maintenance of equipment to ensure efficient operations and reduce emissions.
- Implement dust control measures, such as water spraying, to minimize dust emissions and improve air quality.
- Dust suppression techniques, such as water spraying, to minimize airborne dust.
- Continuous air quality monitoring to identify and address any exceedances of acceptable standards.

Monitoring:

- Air quality monitoring stations around the processing plant to assess pollutant levels and ensure compliance with air quality standards.
- Continuous monitoring of air emissions and adherence to regulatory standards.

10.4.6 Impact pertaining to wildlife disruptions

Operation activities may disturb local wildlife habitats and migration patterns, impacting biodiversity and potentially leading to conflicts between wildlife and human activities. Wildlife disruptions can harm delicate ecosystems and reduce the abundance of native species.

Table 17. Qualitative impact assessment for terrestrial biodiversity.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**M**	**L**	**M**	**M**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures:

- Conduct thorough environmental impact assessments to identify sensitive wildlife habitats and implement protective measures.
- Establish buffer zones to protect wildlife habitats from disturbance and maintain ecological balance.
- Create wildlife corridors to allow animals to move freely between habitats and preserve their natural migration patterns.

Monitoring:

- Regular biodiversity assessments to track the status of wildlife populations and identify any declines or disruptions.
- Monitoring of wildlife corridors and habitats to ensure undisturbed movement of animals and assess the effectiveness of protective measures.

10.4.7 Waste and Disposal impact

The processing plant may generate various types of waste, including hazardous materials, which can pose environmental risks if not managed properly. Improper waste disposal can lead to pollution, soil contamination, and harm to wildlife.

Table 18 Qualitative impacts assessment for waste management.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**L**	**H**	**L**	**M**	**M**	**L**
Mitigated	**L**	**L**	**L**	**L**	**L**	**L**

Mitigation Measures:

- Implement a comprehensive waste management plan to handle waste responsibly, including recycling and proper disposal.
- Promote recycling and reuse of materials wherever possible to reduce waste generation.
- Ensure proper storage and disposal of hazardous waste according to regulations to prevent environmental contamination.

Monitoring:

- Regular waste audits to track waste generation and diversion rates and identify areas for improvement.
- Monitoring of waste disposal sites to ensure compliance with regulations and prevent any environmental harm.

10.4.8 Uncertainty for livelihood impact

The operation phase may lead to uncertainties for local livelihoods, as some community members may worry about potential economic and social impacts. This uncertainty can create anxiety and fear about potential changes to their way of life and livelihood opportunities.

Mitigation Measures:

- Prioritize local hiring and provide skill development programs for community members to increase local employment opportunities.
- Explore economic diversification opportunities to support alternative livelihoods and enhance economic resilience.
- Engage in open dialogue with community members to address their concerns and provide transparent information about potential impacts.

Monitoring:

- Monitor local employment rates and community feedback to assess the project's impact on livelihoods.
- Regular communication with community members to address their concerns and update them on project developments.

During the operation phase, the significance of addressing negative impacts is well recognized. Ensuring the well-being of nearby communities and safeguarding the environment are top priorities. Effective mitigation measures will be put in place, and rigorous monitoring will be conducted to track any potential issues. Through open communication and collaborative efforts, a positive and sustainable relationship with the community will be fostered. The aim is to conduct operations responsibly, keeping a strong focus on environmental conservation and the welfare of everyone involved.

10.4.9 Occupational health, safety and security

Safety and well-being of personnel should be a primary concern to the proponent as it should be to any employer. It should be understood that industrial activities can pose certain risks, so proactive steps has to be taken ensure everyone's safety and health. The proponent will be responsible for ensuring the safety of all personnel at the project site, in accordance with the provisions of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919).

Table 19. Impact evaluation for occupational health, safety and security.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**M**	**M**	**M**	**M**	**M**
Mitigated	**L**	**L/M**	**L**	**L**	**L/M**	**L**

Safety Impacts:

1. Occupational accidents: team members work with heavy machinery and equipment, which can lead to accidents like slips, trips, and falls.

Mitigating Measures:

- Thorough safety training and regular refreshers to raise awareness and promote safe practices.
- Mandatory use of personal protective equipment (PPE) to minimize injuries.
- Conducting frequent safety inspections and audits to spot potential hazards.

Monitoring:

- Regularly review accident reports and analyze their causes to prevent future incidents.
- Keep track of safety training completion to ensure everyone is up-to-date.

2. Fire and Explosions: Certain activities during operations may carry the risk of fire or explosions.

Mitigating Measures:

- Comprehensive fire safety protocols, including the presence of fire extinguishers and fire suppression systems.
- Conducting fire drills and emergency response training to ensure everyone knows what to do in case of an emergency.

Monitoring:

- Regularly check fire safety equipment and conduct drills to assess response times.

Occupational Health Impacts:

1. Exposure to Harmful Substances: Some processes may involve exposure to chemicals harmful to health.

Mitigating Measures:

- Strict adherence to handling and storage procedures for hazardous materials.
- Providing proper personal protective equipment to limit exposure.
- Offering regular health assessments to monitor any potential health risks.

Monitoring:

- Conduct air quality assessments to check for any potential workplace exposure risks.
- Regularly review health assessments to identify any health issues early on.

2. Ergonomic Hazards: Prolonged and repetitive tasks can lead to musculoskeletal disorders and discomfort.

Mitigating Measures:

- Designing workstations ergonomically to reduce physical strain.
- Providing regular breaks and rotating tasks to prevent repetitive strain injuries.

Monitoring:

- Encouraging employees to report any discomfort or strain they experience.
- Regularly reviewing workstation setups for improvements.

3. Mental Health and Well-being: The work environment can impact employees' mental health.

Mitigating Measures:

- Cultivating a supportive work culture that encourages open communication and stress management.
- Providing access to counseling and mental health support services for employees.

Monitoring:

- Regularly checking in with employees to ensure their well-being and address any concerns.
- Conducting well-being surveys to gauge the overall mental health of the workforce.

By putting safety and health at the forefront and implementing effective mitigating measures, it can be ensured that personnel under question remain safe and healthy throughout the operation phase. The proponent's commitment to monitoring and continuous improvement will help in creating a positive and productive work environment for everyone involved.

During the operation phase, the well-being and safety of our workforce are of utmost importance. Here are the key measures and details concerning occupational health, safety, and security:

<u>Occupational health:</u>

- Prior to commencing tasks, all personnel will undergo health assessments to identify any pre-existing conditions that could impact their work or well-being.

- Adequate facilities for personal hygiene, including clean drinking water, sanitation, and handwashing areas, will be provided for the workforce.
- Onsite medical aid facilities will be established, and we will have trained personnel available to promptly respond to any medical emergencies.
- Regular monitoring of workers' health will be conducted to promptly identify and address any health issues related to their work environment.

Safety:

- Thorough risk assessments will be carried out to identify potential hazards in the operational area, and appropriate measures will be implemented to mitigate these risks.
- Personal Protective Equipment (PPE), such as helmets, safety goggles, gloves, and safety footwear, will be mandatory for all personnel to protect them from potential workplace hazards.
- Comprehensive training on operational site safety, emergency procedures, and the proper use of equipment and tools will be provided to all personnel.
- Fall protection measures, including guardrails and safety harnesses, will be in place to prevent falls from heights and ensure the safety of workers.
- Regular inspections and maintenance of equipment will be conducted to ensure safe working conditions and prevent accidents.

Security:

- Access to the operational site will be strictly controlled to prevent unauthorized entry and safeguard valuable assets and equipment.
- Security cameras will be strategically placed to monitor the site, deter theft, and prevent vandalism.
- Trained security personnel will be stationed to patrol the operational area and promptly respond to any security breaches.
- Adequate measures will be taken to securely store materials and equipment to prevent theft or damage.
- Robust cybersecurity protocols will be implemented to safeguard sensitive data, prevent cyber threats, and maintain data integrity.

10.4.10 Socio-economic impacts and mitigation measures

The establishment and operation of processing plant can have significant socio-economic impacts on the local community and regional economy. It is crucial to assess and address these effects to ensure that the project brings tangible benefits while minimizing any adverse consequences.

Table 20. Qualitative impacts assessment for socio economic.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	**M**	**L**	**M**	**M**	**M**	**M**
Mitigated	**M**	**L**	**M**	**M**	**L**	**L**

Employment and local workforce development

The operation of the lithium processing plant will create job opportunities, both during the construction and operation phases. Efforts will be made to prioritize local hiring to boost the socio-economic development of the nearby communities. The project proponent will collaborate with local employment agencies and community leaders to identify and train skilled workers from the surrounding areas. This approach will not only support local livelihoods but also reduce the need for long-distance commuting, mitigating potential traffic-related impacts.

Social Infrastructure and Services

The influx of workers and potential population growth in the region due to the project may put pressure on existing social infrastructure and services, such as schools, healthcare facilities, and public services. The project proponent will work in collaboration with local authorities to assess and address the needs for additional infrastructure and services. Investments may be made in developing or upgrading local infrastructure to support the increased demand and ensure that the local community benefits from the project.

Community Development and Corporate Social Responsibility (CSR)

Long Fire is committed to being a responsible corporate citizen and actively contributing to the well-being of the communities in which it operates. The project proponent will develop a Community Development Plan and CSR initiatives aimed at enhancing social and economic development in the local area. This may include supporting education, healthcare, cultural preservation, environmental conservation, and other projects that align with the needs and aspirations of the local community.

Socio-economic monitoring and reporting

To evaluate the effectiveness of the socio-economic mitigation measures and ensure ongoing positive impacts, the project proponent will implement a robust socio-economic monitoring program. This program will track key indicators, such as local employment rates, income levels, access to services, and community feedback. Regular reports will be prepared and shared with relevant stakeholders, including local communities, regulatory authorities, and NGOs, to demonstrate the project's socio-economic contributions and address any concerns that may arise.

Stakeholder engagement during operation

Stakeholder engagement is a critical aspect of the project's success and sustainability. The proponent is committed to maintaining open communication and collaboration with all stakeholders throughout the operation phase. This will involve regular meetings, public consultations, and communication channels to address queries, receive feedback, and update stakeholders on project progress and performance.

The company will continue to engage with local communities, NGOs, government agencies, and other interested parties to ensure that their voices are heard, and their concerns are addressed effectively. The feedback received will be used to refine and improve operational practices, leading to better environmental and socio-economic outcomes.

10.5 Decommissioning phase

The decommissioning phase is a critical aspect of the project's lifecycle, and careful planning is necessary to ensure the safe closure of the lithium processing plant and the successful reclamation of the site.

10.5.1 Decommissioning plan and land reclamation

Before the commencement of the decommissioning phase, a detailed Decommissioning Plan will be prepared. This plan will outline the steps and procedures for dismantling and removing equipment and structures, safe handling and disposal of hazardous materials, and site restoration.

The land reclamation process will aim to restore the site to its pre-development state or a condition that is compatible with the surrounding natural environment. The reclamation plan will include measures to stabilize soils, reintroduce native vegetation, and minimize erosion.

10.5.2 Waste management during decommissioning

During the decommissioning phase, the generation of waste materials will be minimized as much as possible. Any waste generated will be managed in accordance with local regulations and best practices. Hazardous materials will be handled and disposed of safely, following approved methods and disposal facilities.

10.5.3 Health and safety during decommissioning

The safety of workers and the surrounding community will remain a top priority during the decommissioning phase. Proper safety protocols will be strictly followed, and workers will be provided with appropriate training and equipment for safe dismantling and removal of equipment and structures.

10.5.4 Stakeholder engagement during decommissioning

Stakeholder engagement remains a cornerstone of Long Fire Investments' commitment to responsible and sustainable operations. Throughout the decommissioning phase, the company will maintain regular communication with stakeholders to keep them informed of the progress, potential impacts, and mitigation efforts.

Long Fire Investments will hold public consultations, meetings, and workshops to discuss the decommissioning process and its implications on the local community and environment. Feedback from stakeholders will be carefully considered in refining the decommissioning plan and ensuring a transparent, collaborative, and successful closure of the lithium processing plant.

10.6 Environmental monitoring and reporting

10.6.1 Air quality monitoring

Air quality monitoring is a critical aspect of assessing the impact of processing plant on air quality. Monitoring stations will be strategically located within and around the project site to measure concentrations of key air pollutants, including particulate matter (PM10 and PM2.5), nitrogen oxides (NOx), sulfur dioxide (SO2), volatile organic compounds (VOCs), and greenhouse gases (GHGs). The collected data will be analyzed regularly to evaluate compliance with relevant air quality standards and to identify any potential exceedances or adverse trends. In the event of anomalies, appropriate corrective actions will be taken to address the issues promptly.

10.6.2 Water quality monitoring

Water quality monitoring will assess the impact of the lithium processing plant on both surface water bodies and groundwater sources. Parameters such as pH, total suspended solids (TSS), heavy metals, dissolved oxygen, nutrients, and other contaminants will be measured regularly at designated monitoring points. This information will help to ensure that wastewater discharge and other operational activities do not compromise the quality of local water resources. In case of any deviations from regulatory standards, appropriate corrective measures will be implemented to safeguard water quality.

10.6.3 Soil and vegetation monitoring

Soil and vegetation monitoring will focus on evaluating changes in soil characteristics and vegetation health within the project area. Soil samples will be collected at various depths to assess any potential soil contamination or nutrient changes. Additionally, the condition of local vegetation will be assessed to ensure that plant health is not adversely affected by project activities. The results will guide the implementation of measures to prevent soil erosion and preserve the integrity of local ecosystems.

10.6.4 Noise and vibration monitoring

Noise and vibration monitoring will assess the project's acoustic impact on the surrounding environment, including nearby residential areas. Sound level meters will be installed at designated locations to measure noise levels continuously. Similarly, vibration sensors will be used to monitor ground vibrations arising from construction and operational activities. The data collected will be analyzed to ensure compliance with relevant noise regulations and standards. Mitigation measures, such as noise barriers or altering operational schedules, will be implemented if necessary to minimize noise and vibration impacts.

10.6.5 Traffic and transportation monitoring

Traffic and transportation monitoring will focus on understanding the traffic flow patterns and the project's influence on local transportation infrastructure. Traffic surveys will be conducted to assess changes in traffic volumes and patterns during the construction and operation phases. The data will help in identifying potential congestion points and road safety concerns, enabling the implementation of traffic management plans and measures to mitigate any adverse effects.

10.6.6 Stakeholder engagement and social impact Monitoring

In addition to environmental monitoring, Long Fire Investments (Pty) Ltd will continue its stakeholder engagement efforts during the operation and decommissioning phases. Stakeholder feedback and concerns regarding social impacts will be actively sought and addressed.

Social impact monitoring will focus on assessing the effectiveness of socio-economic mitigation measures and understanding how the project has influenced the well-being of the local community. Key indicators, such as changes in employment rates, income levels, access to services, and community development projects, will be tracked and evaluated regularly. The feedback received will be used to make adjustments to the Community development plan and ensure that the project's socio-economic contributions align with the community's needs and aspirations.

10.7 Stakeholder engagement

10.7.1 Engagement approach and strategy

The environmental practitioner and the proponent recognize the significance of effective stakeholder engagement in ensuring the success and sustainability of the project. The approach to engagement has been inclusive, transparent, and is continuous throughout all phases of the project. The input and perspectives of stakeholders, including local communities, government agencies, NGOs, and others, are highly valued. Open and transparent communication will be maintained to create a collaborative environment where everyone's voice is heard and respected. The commitment to stakeholder engagement is an ongoing process that adapts to the changing needs and concerns of all parties involved. This approach aims to build stronger relationships with the communities and organizations, leading to a project that benefits everyone and has a positive impact on the environment and society. Throughout the stakeholder engagement process, the team carefully identified key stakeholders and acknowledged their specific interests in the project. Tailored communication channels were established to facilitate engagement with different stakeholder groups, ensuring that information reached them in a timely manner. The team was committed to providing clear and transparent information about the project, including potential impacts and proposed mitigation measures.

The project actively encouraged stakeholders to share their feedback, ask questions, and express concerns openly. Their valuable input was considered and integrated into the decision-making processes and project planning, making it a collaborative effort between all involved parties. By fostering a culture of open dialogue and inclusivity, the project aimed to build trust and ensure that every stakeholder's voice was heard and valued.

The stakeholder engagement strategy included:

- Identification of key stakeholders and their respective interests in the project.
- Tailored communication channels to facilitate engagement with different stakeholder groups.
- Timely dissemination of project-related information, including potential impacts and proposed mitigation measures.
- Opportunities for stakeholders to provide feedback, ask questions, and express concerns.
- Incorporation of stakeholder input into decision-making processes and project planning.

10.7.2 Stakeholder consultation and feedback mechanisms

During the stakeholder consultation, we engaged in various interactive methods to encourage open and constructive dialogue. We held meetings and public consultations through newspapers and other platforms to ensure that all voices were heard. Our approach was inclusive, making sure to accommodate the diverse needs and preferences of stakeholders, such as local communities, NGOs, and government agencies, who have a vested interest in the project.

To further strengthen this commitment, Long Fire Investments (Pty) Ltd will set up effective feedback mechanisms. We want to provide stakeholders with convenient ways to express their opinions and raise any concerns they might have about the project. This will include dedicated email addresses and feedback forms, ensuring that stakeholders have accessible and confidential channels to communicate their viewpoints. Our aim is to foster a transparent and collaborative process, where stakeholders feel empowered to actively participate and contribute to the project's development and success.

10.7.3 Incorporation of stakeholder input

The input received from stakeholders will be systematically analyzed and considered in project decision-making. The project proponent is committed to incorporating relevant and feasible stakeholder input into the development, operation, and decommissioning of the lithium processing plant. Where possible and appropriate, stakeholder suggestions will be integrated into the project's design and mitigation measures to optimize environmental and social outcomes.

The commitment goes beyond just listening to stakeholders; it involves actively seeking ways to integrate their valuable input into the entire lifecycle of the project. From the initial development phase to the operation and eventual decommissioning, stakeholder suggestions will be thoroughly analyzed and considered.

The goal is to make better choices that benefit not only the project but also the environment and the community. By including stakeholder perspectives, the aim is to optimize the environmental and social outcomes of the project. Whenever possible and suitable, stakeholder ideas will be incorporated into the plant's design and mitigation measures. This approach ensures that the project is responsive to the concerns and interests of stakeholders, leading to a positive and sustainable impact on the environment and the community.

11. Conclusion

Long Fire Investment (Pty) Ltd, the proponent, has acquired mineral rights for extracting various metals in the area designated for the construction of a lithium processing plant. The plant will operate on mining claim 73418, situated approximately 50 km southwest of Uis settlement, within Okombahe Reserve, Erongo Region. This Environmental Management Plan (EMP) outlines a comprehensive strategy to manage and mitigate environmental impacts related to the plant's operations. It is crucial to implement an effective EMP to ensure sustainable practices, minimize adverse effects on the environment, and comply with regulatory requirements.

The project is committed to adhering to all relevant environmental laws, regulations, and permits. Environmental awareness and training for all personnel involved in the project are highly valued. The project aims to engage positively with the community and consider their input and concerns throughout its duration. Emphasis is placed on environmental preservation, sustainability, responsible operation, and minimizing the project's environmental footprint to leave a positive impact on the surrounding environment and communities.

Potential positive and negative impacts of the proposed lithium processing operations on mining claim 73418 were identified and assessed. The EMP provides mitigation measures and recommendations to minimize these impacts to acceptable levels. The EMP should be used as a reference document during all project phases, and regular audits should ensure compliance. Parties responsible for non-compliance with the EMP should be held accountable for any required rehabilitation.

Overall, the potential environmental impacts of the project are expected to be of low probability, localized extent, and low magnitude and duration. This report serves as a framework for integrating mitigation measures and applicable legal tools to ensure compliance and sustainability. Adequate human and financial resources must be provided by the proponent to implement the proposed mitigations effectively and ensure proper environmental management during the planned activities.

12. Recommendations

- ✓ It is recommended that the establishment of the lithium processing plant on the project site be granted an Environmental Clearance Certificate, provided that:
- ✓ The EMP's mitigations are fully implemented as specified, and improvements are made where necessary.
- ✓ The Proponent and all their workers comply with the legal requirements governing this type of project and its associated activities.
- ✓ In summary, the following should be observed:
- ✓ The proponent must take necessary actions to implement the EMP and minimize adverse environmental impacts.
- ✓ All contractors and employees must be fully informed about the EMP provisions, guidelines, and legislative requirements, and adequate insurance cover should be in place.
- ✓ Environmental risks associated with construction and processing activities should be considered and planned for, with best practices implemented to minimize impacts.
- ✓ Close liaison and consideration with relevant landowners and regulatory authorities are essential, with advance notices and permissions obtained for access.
- ✓ Operations should adhere to the EMP, implementing necessary mitigation measures, monitoring, and stipulated rehabilitation measures.
- ✓ If portable water is discovered during borehole drilling, the proponent should support other land users in accessing freshwater for consumption, wildlife, and agriculture, as requested by the local community/landowners. Relevant underground water abstraction permits must be obtained from the Ministry of Agriculture, Water, and Land Reform, with observation of abstraction and monitoring conditions.
- ✓ Any damage to vegetation, land surface, or landowner property resulting from the development should be corrected promptly.

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14. Appendices

A: Proof of Advertisements, Letters and Notices

Appendix B: CV of EAP

Appendix C: BID