

# DRAFT ENVIRONMENTAL MANAGEMENT PLAN

FOR THE PROPOSED MINERALS EXPLORATION FOR  
BASE & RARE METALS, INDUSTRIAL MINERALS,  
PRECIOUS METALS, AND SEMI-PRECIOUS STONES  
WITHIN EPL 9110

Near Tsumeb

**Oshikoto & Otjozondjupa Regions**

MAY 2023

**APP: 0673**



**DOCUMENT INFORMATION**

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## 1. INTRODUCTION

Alliance Environmental Consultancy CC (AEC) (herein referred to as the consultant) has been appointed by Philco One Hundred and Seventy-Three (Pty) Ltd (herein referred to as the proponent) to act on their behalf in obtaining an Environmental Clearance Certificate (ECC) for the proposed minerals exploration for base & rare metals, industrial minerals, precious metals, and semi-precious stones within EPL9110 near Tsumeb in the Oshikoto and Otjozondjupa regions. The project area is located approximately 16km East of Tsumeb and about 30km North of Grootfontein in the Oshikoto and Otjozondjupa Regions. The site is accessible via the D3039 or D3021 district roads from the M75 main road north and east of Tsumeb respectively. The EPL covers approximately an area of 78906 hectares in total. The licence covers portions of farmlands in the area (see Figure 1&2).

The proponent pegged the area through the MME on 31 October 2022. The EPL is still pending approval as it is subject to an ECC by MEFT which is the reason for conducting this environmental scoping and impact assessment.

The corner coordinates of the EPL are provided in the table below.

TABLE 1 - CORNER COORDINATES FOR THE EPL

| ID       | LATITUDE   | LONGITUDE  |           | LATITUDE   | LONGITUDE  |           | LATITUDE   | LONGITUDE |
|----------|------------|------------|-----------|------------|------------|-----------|------------|-----------|
| <b>1</b> | -18.999317 | 17.957203  | <b>10</b> | -19.280379 | 18.0926100 | <b>19</b> | -19.256063 | 17.889912 |
| <b>2</b> | -18.999608 | 18.176300  | <b>11</b> | -19.292246 | 18.0764460 | <b>20</b> | -19.164218 | 17.890282 |
| <b>3</b> | -19.117619 | 18.162620  | <b>12</b> | -19.299281 | 18.0703590 | <b>21</b> | -19.164617 | 17.961144 |
| <b>4</b> | -19.122401 | 18.220082  | <b>13</b> | -19.307541 | 18.0459310 |           |            |           |
| <b>5</b> | -19.201562 | 18.219816  | <b>14</b> | -19.297030 | 18.0422500 |           |            |           |
| <b>6</b> | -19.227700 | 18.170696  | <b>15</b> | -19.304863 | 18.0184910 |           |            |           |
| <b>7</b> | -19.209812 | 18.159018  | <b>16</b> | -19.315642 | 18.0224300 |           |            |           |
| <b>8</b> | -19.226063 | 18.116775  | <b>17</b> | -19.321305 | 18.0028860 |           |            |           |
| <b>9</b> | -19.272577 | 18.1163400 | <b>18</b> | -19.256065 | 18.002716  |           |            |           |

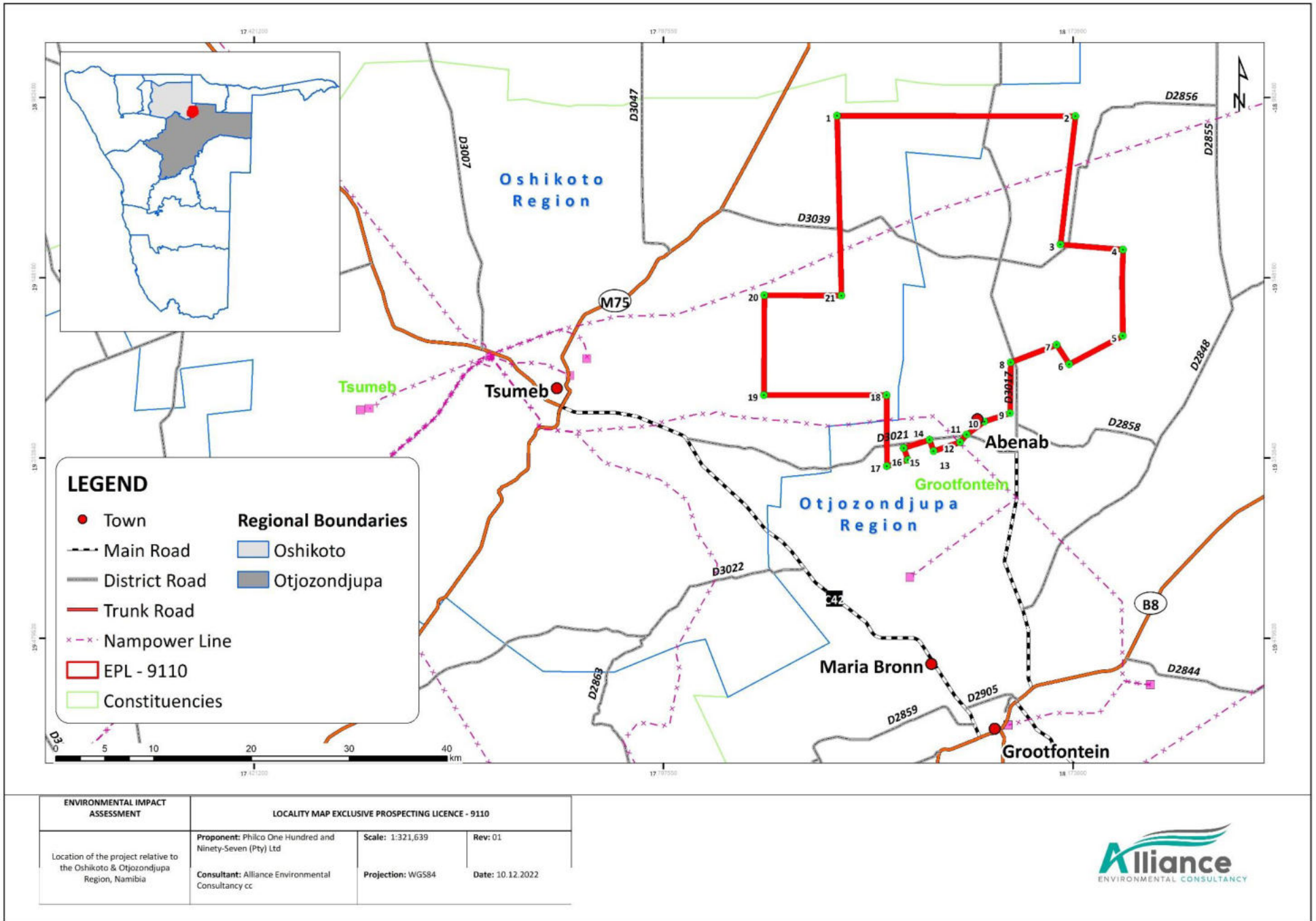


FIGURE 1 – REGIONAL LOCATION OF THE EPL AND SURROUNDING INFRASTRUCTURE.

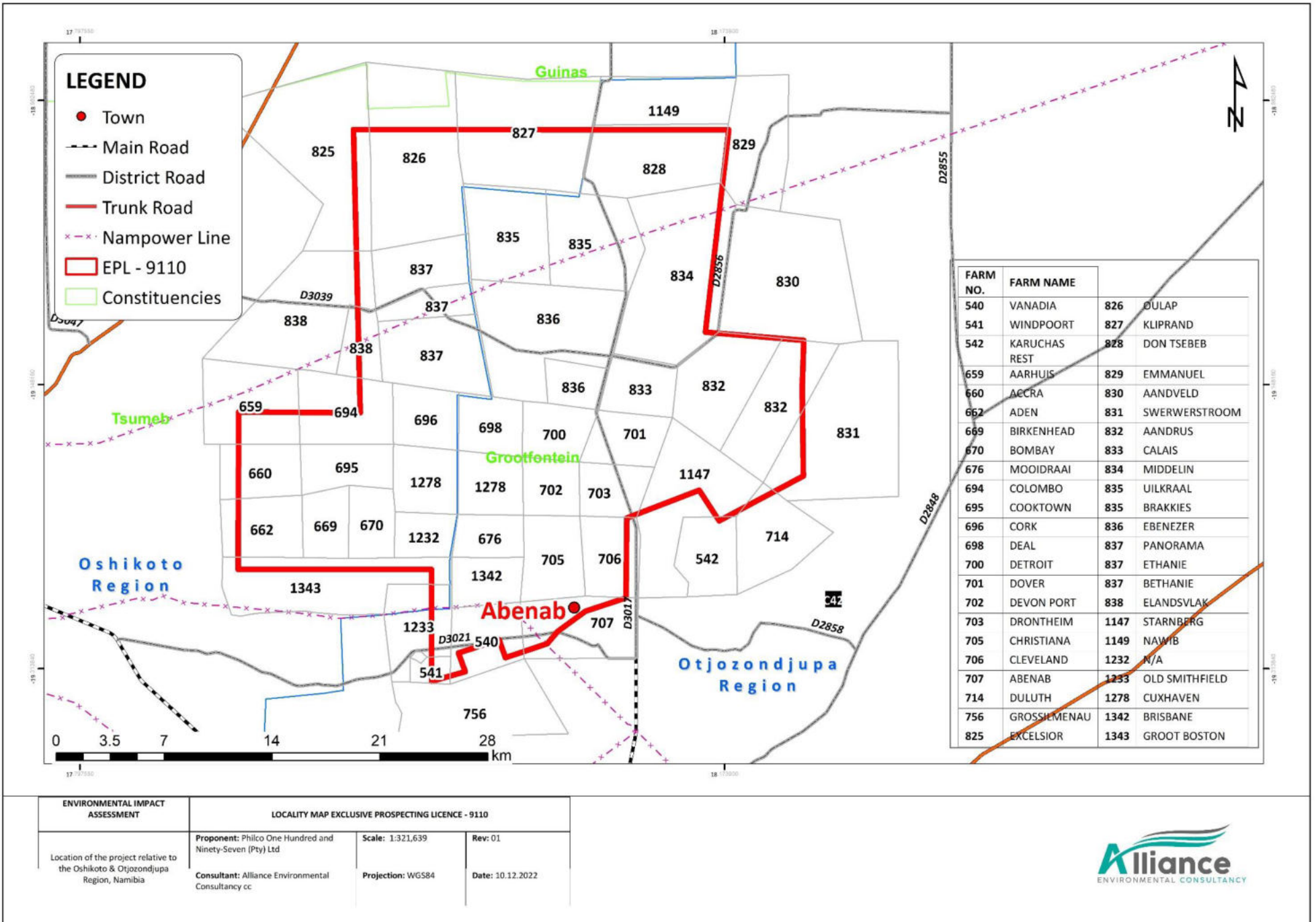


FIGURE 2 - EPL LOCATION WITH FARMS

## **1.1. PURPOSE OF THE DOCUMENT**

Alliance Environmental Consultancy CC (AEC) has prepared this document as part of the Environmental Scoping and Impact Assessment for the proposed prospecting which was conducted in terms of the Environmental Management Act, 2007 (Act No 7 of 2007). This Environmental Management Plan is a live document that has been prepared based on the environmental impacts identified in the Environmental Scoping and Impact Assessment (ESIA) and should be read in conjunction with the ESIA Report.

The aim of this document is to provide management measures to address the environmental impacts that have been identified and to give possible mitigation measures/recommendations. It is essential for personnel involved to fully be aware of the possible environmental issues and the means to avoid or minimize the potential impacts of activities on site.

Furthermore, the proponent fully understands the legal and policy requirements as a holder of the EPL. Impacts identified in the EIA form the basis of a set of environmental specifications that will be implemented on-site. These environmental specifications act as an agreement between the proponent and the Ministry of Environment, Forestry, and Tourism (MEFT).

## **1.2. LIMITATIONS OF THE ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

The project-specific information used in this document is that provided by the Proponent, Consultants experience, relevant literature, as well as from direct communication with the farmers and landowners, therefore no specialist studies were conducted for this project. AEC makes the assumption that all project-related technical data and information provided by the Proponent is complete and accurate and that all information required for the creation of this EMP has been revealed. Additionally, it is expected that the pertinent data from the many sources of literature studied is accurate. Lastly, this EMP was created under the presumption that the planned project will not undergo any substantial changes.

## **1.3. PROJECT ACTIVITIES**

The proponent wishes to conduct an exploration program on EPL 9110 for base & rare metals, industrial minerals, precious metals, and semi-precious stones. Once granted by MME, the licence will be valid for three years with possible renewal after this period. The commencement of the project is planned as soon as the environmental clearance certificate and physical EPL licence has been issued. The exploration program will be carried out as outlined in more detail below:



### **PLANNING PHASE ACTIVITIES**

This will incorporate the procurement of all required permits and agreements with various state and parastatal agencies as well as surface landowners/land custodians. These will result in various agreements to be entered into between the proponent and the respective parties.

Possible parties that will be/are being consulted include the following:

- Ministry of Mines and Energy (MME)
- Ministry of Environment Forestry & Tourism (MEFT, this application)
- Respective Regional Councils
- Ministry of Agriculture, Water & Land Reform (MAWLR)
- Landowners/ Land custodians

### **INITIATION/PRE-OPERATIONAL PHASE**

#### *I. Accommodation*

During this phase, a provisional field camp is planned with basic infrastructure as required for operations within the boundaries of the EPL, such providing accommodation on site. Alternatively, the workers can commute from the nearby town/settlement or any accommodation places that may be deemed sufficient by the proponent. Any infrastructure will be erected with the permission of the land custodians in the area, i.e., the farmers. The accommodation area will be demarcated to limit the movement of equipment and personnel beyond the footprint of the camp area, and also to limit the movement of animals onto the site from the surrounds.

#### *II. Access*

Existing access roads will be utilized and if need be, upgraded to accommodate heavy motor vehicles and operational machines. The selective clearing of vegetation in areas designated for prospecting will be minimal from the foreseen operations. Usually, land is cleared at areas where drilling operations will be conducted or where the camping area will be erected. When lateral expansion is required the removal of vegetation will be done in association with the Directorate of Forestry that issues the relevant permits.

#### *III. Waste management*

Solid waste will be removed off site and taken to the nearest registered dumpsite (Tsumeb). The proponent intends to use portable toilets at work sites, when necessary. Alternatively, toilets may be established, with septic tanks to be emptied regularly using a tanker truck which removes the sewerage

and takes it to the municipal sewerage works. For a longer-term field camp arrangement, a French drain system could be devised and constructed.

### **OPERATIONAL SUPPORT SERVICES**

#### *I. Water supply*

Water supply sources being considered are either.

- Ground water abstraction; and
- NamWater

The proponent does not expect to use much water, as the only main activities are for camp use and for drilling (approximately 2000L – 2500L or less a month). It is suggested that amounts of water can be sourced from the nearest NamWater supply scheme or from one of the surrounding neighbors or community boreholes and then be trucked to the exploration site and camp, this is the preferred option.

If for any reason more water is required then the proponent suggests abstraction of ground water, which can be done at minimal extraction cost, a borehole can be sunk to augment supply volumes or an existing borehole can be utilized with the owner's permission. However, for this option depending on the required volumes (if exceeding limits for the applied purposes), groundwater exploration would need to be undertaken followed by the required permit application process with the Directorate of Water Affairs (DWA).

#### *II. Power supply*

No infrastructure development to get electricity from the national grid has been planned. All mobile equipment is diesel driven and self-propelled. Static equipment will use electricity generated by diesel generators. A small field of photovoltaic panels is also envisaged for power generation in the medium term.

#### *III. Onsite fuel storage*

Diesel storage at the site will be only temporary and intermittent during drilling and bulk sampling operations. Approximately 200 – 400 litres of diesel will be stored in a bunded fuel tank system, conveniently placed and accessible for deliveries. This facility will be of modern construction, either double-skinned or 110% bunded to ensure spills are prevented.

Delivery systems will use sealed fittings to prevent spillage. The fuel facility, when in operation, is to be actively manned. Standardized spill kits and reporting systems will be in place to deal with any

hydrocarbon spills. Contaminated soils will be transferred to a remediation site, which is specifically designed for such treatment.

### **PROSPECTING/OPERATIONAL PHASE ACTIVITIES**

The company is targeting rare and base metal mineralization of the Otavi Mountain Land (OML) which can be associated with precious metals and industrial mineral mineralization's. More than 620 mineral occurrences are known in the area, with the majority being located in the Gauss Formation of the Abenab Subgroup and in the Elandshoek Formation of the Tsumeb Subgroup. Operations are scheduled to operate 12 hours a day (6am to 6pm) seven days a week with the farmers agreement. The personnel will be transported to and from the operational site by company transport.

#### *I. Vehicle, machinery and associated equipment*

Main equipment types to be used will include 4X4 bakkies, drill rigs (Reverse Circulation (RC) or Diamond Drill Hole (DDH)), excavators and front-end loaders to be used if overburden topsoil removal is required, water tankers for the camp site and to support drilling operations, portable analyses and geophysical equipment, sampling equipment (bags, sieves, spades etc.). The aforementioned will be stored in designated areas at the accommodation place.

The projected mineral exploration activities during prospecting follow a staged approach. The different work aspects and consecutive phases are summarized as follows:

#### *II. Desktop studies including geological mapping.*

High resolution data are purchased from the MME to assist in a desktop review of existing historic geological exploration reports data as well as all past research conducted in the general area to see if there are any prospective targets. The data available is used to understand the background of the area through remote sensing and topographic surveys. This involves a review of geological maps of the area and on-site ground traverses and observations. The maps and data will be updated where relevant information has been obtained.

#### *III. Geophysical survey*

The geophysical surveys include the collection of information of the substrata, by ground and airborne techniques, through sensors such as radar, magnetic and electromagnetic to detect any mineralization in the area. Ground geophysical surveys would be carried out using sensors mounted on vehicles or carried by hand. Aerial geophysical surveys would be carried out using sensors mounted on low flying aircraft or unmanned drones. The airborne geophysical technique tries to measure electrical conductivity and magnetic variations of the ground using measuring instruments suspended underneath a helicopter, drone or aircraft. Where necessary, permits will be obtained from Namibia

Civil Aviation Authority (NCAA) to support the airborne geophysical surveys. Generally, these techniques are not intrusive in terms of impacts towards the environment.

#### IV. *Geochemical sampling*

This stage incorporates geochemical analyses, geochemical soil sampling programs, and additional ground geophysical surveys.

For soils sampling, it is done at depths of at least 10 - 30cm therefore firstly removing the upper surface of the soil that will be filled back once a sample is collected. The samples are collected into bags of approximately 100 - 500grams. Usually, soil samples are to be collected where drainage and catchment basins are poorly developed. Sampling can be carried out in up to 8 teams, each consisting of a field technician or geologist and local field assistants.

Other surface samples collected may include termite mounds and rocks if exposed at surface.

Once the exercise concludes, the samples are collected and sent to an analytical laboratory (as preferred by the proponent) for geochemical trace element analysis to determine if sufficient quantities of the desired mineralization are present.

Using the results obtained through the geophysical and geochemical surveys, a guidance map is created. When target areas are determined, it may be necessary for drill pads to be established. Efforts will be made to limit or minimize the amount of clearing of trees and shrubs, including by considering alternative sites for drilling. Should sensitive/protected species be present in the target area a trees removal and clearing permit is applied for through the Department of Forestry (DoF).

#### V. *Exploration Drilling*

Exploration drilling is the process of sampling rock below surface from an area, where it is suspected that there may be mineralization. The most commonly used drilling techniques are Reverse Circulation Drilling (RC) or Diamond Drilling. Both methods are applied in exploration, resource evaluation and subsequently in defining an ore reserve.

Exploration Diamond Drilling differs from other geological drilling in that a solid core is extracted from depth, for examination on the surface. The key technology of the diamond drill is the actual diamond bit itself. It is composed of industrial diamonds set into a soft metallic matrix. The drill produces a "core" which is logged, photographed and which can be split longitudinally for sampling purposes. Half of the split core is assayed while the other half is permanently stored for future use and reference.

RC Drilling uses a pneumatic hammer, which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample, which is comprised of rock chips. It is relatively quick and cheap compared to Diamond Drilling. The RC technique is common for infill drilling, at a much higher density or narrower spacing to allow extrapolations of the rock units. Usually, the drill area

is approximately 20m x 20m and during the drill process is off-limits to those not part of the exploration team for safety reasons.

Once the samples are sufficient and analysed at the laboratory the information may be used for resource modelling and delineation of mineral resources for further study. These may develop into mining targets after several further phases of work over 3-5 years of evaluation.

*VI. Advanced prospecting/exploration*

In the advanced stage of exploration, larger amounts of rock sample material may be required for performing processing trials and for metallurgical testing programs. Ground conditions and geotechnical parameters also need to be established for planning and costing purposes.

Bulk sampling for metallurgical tests and processing trials will be done to complement the material obtained during drilling. Possibly, pits or trenches are to be dug / excavated to a depth of 5m, and several hundred cubic meters of samples are taken. The location of the pits will depend on the drilling results and will be in close proximity where drilling has occurred. The size of the sample required depends on the nature of the mineralization as observed from drilling and sampling.

*VII. Pre-feasibility and feasibility studies*

If the detailed exploration activities yield positive results, the exploration data will be compiled into a pre-feasibility report, and upon positive results from further work, a detailed feasibility study will be conducted on the identified site-specific area where a mineral deposit is defined.

Additional detailed and site-specific drilling, bulk sampling, laboratory testing, and trial mining may be conducted.

*VIII. Mining Licence Application or End of exploration Program*

Only if an economic mineral resource is discovered within the EPL area, the proponent will compile an application for a mining licence and a detailed environmental impact assessment study will be undertaken. The EIA will comprise of detailed site-specific specialists' studies of different aspects of the project these studies may include the following impact assessments; Hydrology and geohydrology, archaeology, air quality, traffic, biodiversity (fauna & flora), visual and soil etc.

Should there be no discovery of any economic minerals that warrants a Mining Licence, the proponent can decide to end the operations of the project and the area is rehabilitated.

**DECOMMISSIONING AND FINAL REHABILITATION**

In accordance with the Environmental management Act (EMA), the proponent is required to make funds accessible which will specifically be available and allocated for rehabilitation efforts. This fund

should continually be available during the period of the active operation yet also be sufficient to cover all decommissioning activities when required.

Decommissioning activities will include the removal of any temporary infrastructure, rehabilitation of roads and other linear infrastructure, drill sites and bulk sampling pits, as necessary. This is done in order to reduce the effects of soil erosion and to re-establish normal ecosystem functionality so as to rehabilitate the environment. The proponent will review rehabilitation requirements with the local pastoralist and may not rehabilitate a road only at the request of the local landowner.

#### **1.4. SUMMARY OF THE RECEIVING ENVIRONMENT**

Generally, Tsumeb lies in the areas that receive higher annual rainfall in the country with more than 550mm annually, hence allowing successful intensive agricultural practices. The EPL overlaps with more than 35 commercial farmlands and/or farm portions which is the predominant land use. Despite the importance of agriculture in the area, minerals occurrence in the surrounding is considered prominent. The importance of proactive communication between the proponent, farmers, and owners of nearby properties is emphasized. Excellent relationship should be maintained throughout the life of the project.

The Tsumeb climate is classified as hot semi-arid climate where the wet season is normally hot and mostly cloudy whilst the dry season is warm, windy, and clear. The hot season lasts for 3.5 months, from September to December, with an average daily high temperature above 31°C. Tsumeb receives an average precipitation of 528mm per year. The average percentage of cloud cover near the Tsumeb surrounding area fluctuates seasonally over the course of the year. The maximum windspeed recorded for areas around Tsumeb ranges from 10 – 14.9 mph easterly winds with an average of 3.2mph (Iowa weather, 2023).

The study area lies within the Karstveld of the Tree-and-shrub Savanna vegetation biome. The vegetation within the study site was found to be dominated by mopane (*Colophospermum mopane*) and purple pod terminalia (*Terminalia prunioides*). Plant diversity is estimated at >500 species (Mendelsohn et al, 2002), notwithstanding the fact that terrain and water availability may contribute to local differentiation. Other species with commercial potential that could occur in the general area include *Hyphaene petersiana* (Makalani palm) – a palm tree native to the subtropical, low-lying regions of south-central Africa, *Combretum imberbe* (Lead wood), *Peltophorum africanum* (African Wattle), *Acacia mellifera detinens* (Black-thorn acacia) and *Acacia luederitzii* (Kalahari acacia) (Enviro Dynamics, 2014). Mopane trees are prevalent in the area, and it is protected due to its high value to humans and their livestock. Although several protected species occur in this habitat, with the exception of *Colophospermum mopane*, they are present in low numbers.

According to the Atlas of Namibia, nationally, the area is regarded as a relative medium - high mammal, reptile and intermediate amphibian diverse. Although many endemic species are known to occur from the general area, it cannot be determined if any of these are expected with the EPL area. Species most likely to be adversely affected by exploration would be the variety of reptiles and ground nesting birds specifically associated with this area. Mitigation measures aimed to prevent any serious or lasting damage to this diversity including limiting damage to habitat in general and prohibiting poaching is detailed in the EMP.

The soils in this area are broadly categorized to the group of leptosols and defined by a Mollic leptosols domination soils. Mollic Leptosols, the predominant soil type in the EPLs, have strong surface structure but poor water-holding capacity. The EPL area consists of Kalahari and Namib sands as well as Otavi group. The basement in the EPL area is made up of Palaeoproterozoic granitic gneiss and amphibolites which have been intruded by Mesoproterozoic granite. The underlying geology primarily consists of limestones (including calcrete), dolomites and marbles. Pre-historic weathering of surface and underground limestone by water caused them to dissolve and a "karst landscape" developed. The company is targeting rare and base metal mineralization of the OML which can be associated with precious metals and industrial mineral mineralization.

The proposed EPL lies in the Owambo Groundwater basin. The EPLs fall within the hydrogeological region of the Otavi Mountain Land, an area characterized by a productive fractured aquifer mainly recharged through rainfall and water quality is generally of a high standard (Christelis, 2001). The water table in the area is extremely shallow; past research shows that at some places intersected at only 4m below surface (Enviro Dynamics, 2014). The majority of the area has been designated a "Groundwater Control Area," highlighting the value of its potential for groundwater on a national scale (Christelis, 2001). The entire area is dependent on groundwater resources for domestic purposes and stock watering. There are more than 30 boreholes situated within and around the EPL area and farmers around the area predominantly use water from borehole abstraction. Provided that the boreholes within the area are operational, it is highly probable assumed that water will be obtained from some of these existing boreholes during the exploration activities. Appropriate permit should be obtained from the DWA should borehole water use be realized.

Figures 3 to 6 provide some baseline maps of the project area.

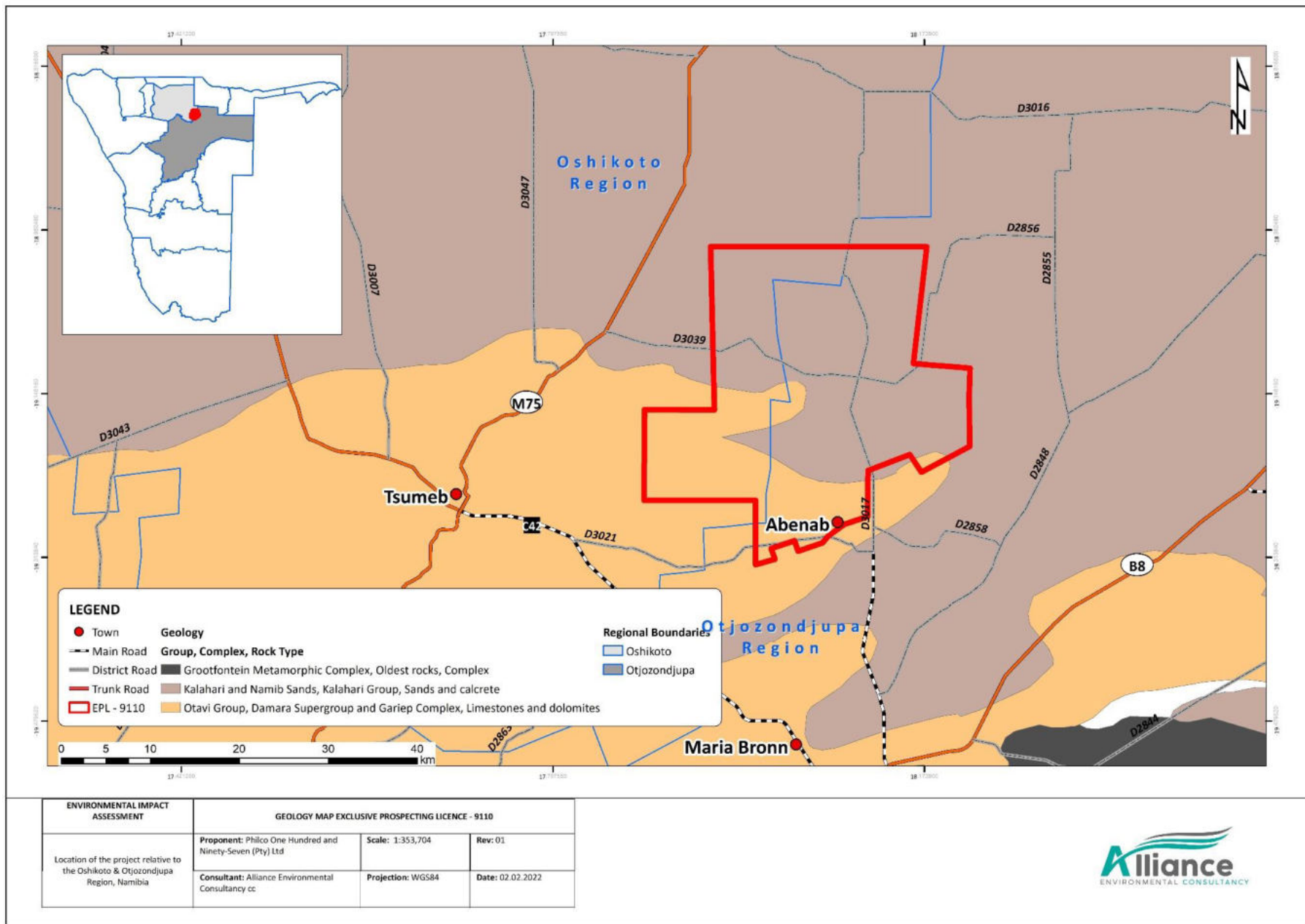


FIGURE 3 - GEOLOGY OF THE PROPOSED PROJECT AREA



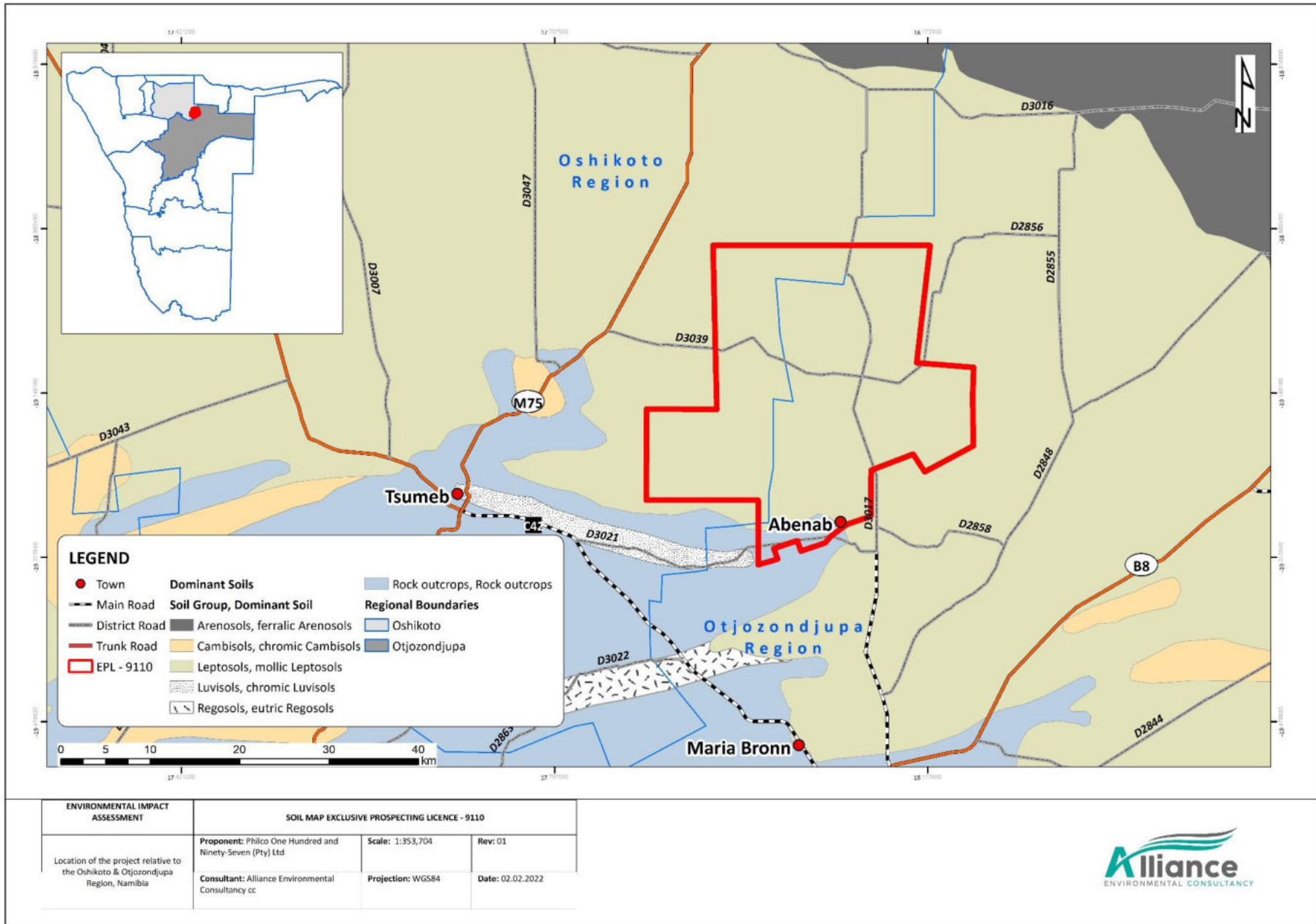


FIGURE 4 - DOMINANT SOIL TYPE SURROUNDING THE PROJECT AREA

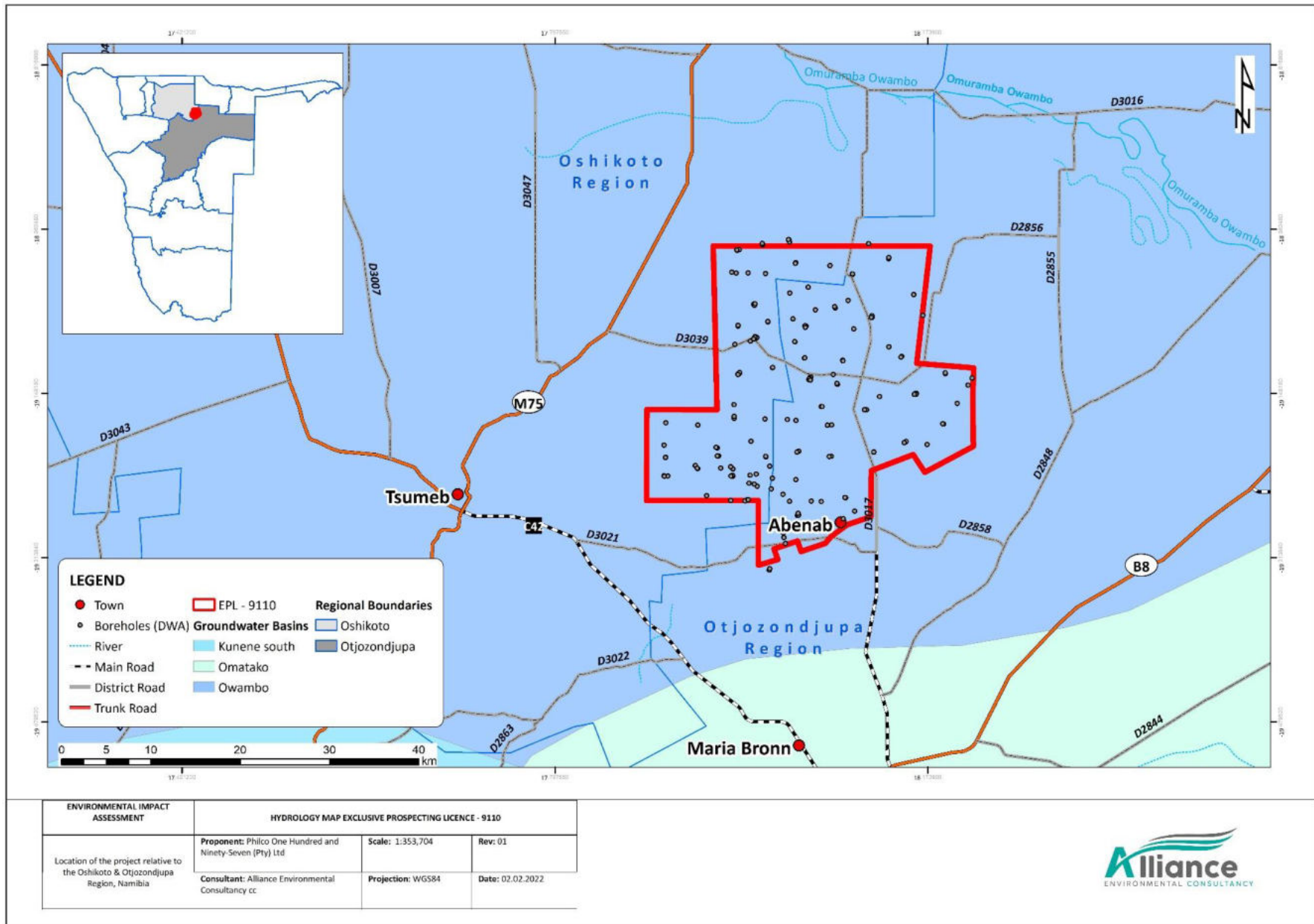


FIGURE 5 - GROUNDWATER BASINS AND HYDROLOGY OF THE PROJECT SITE

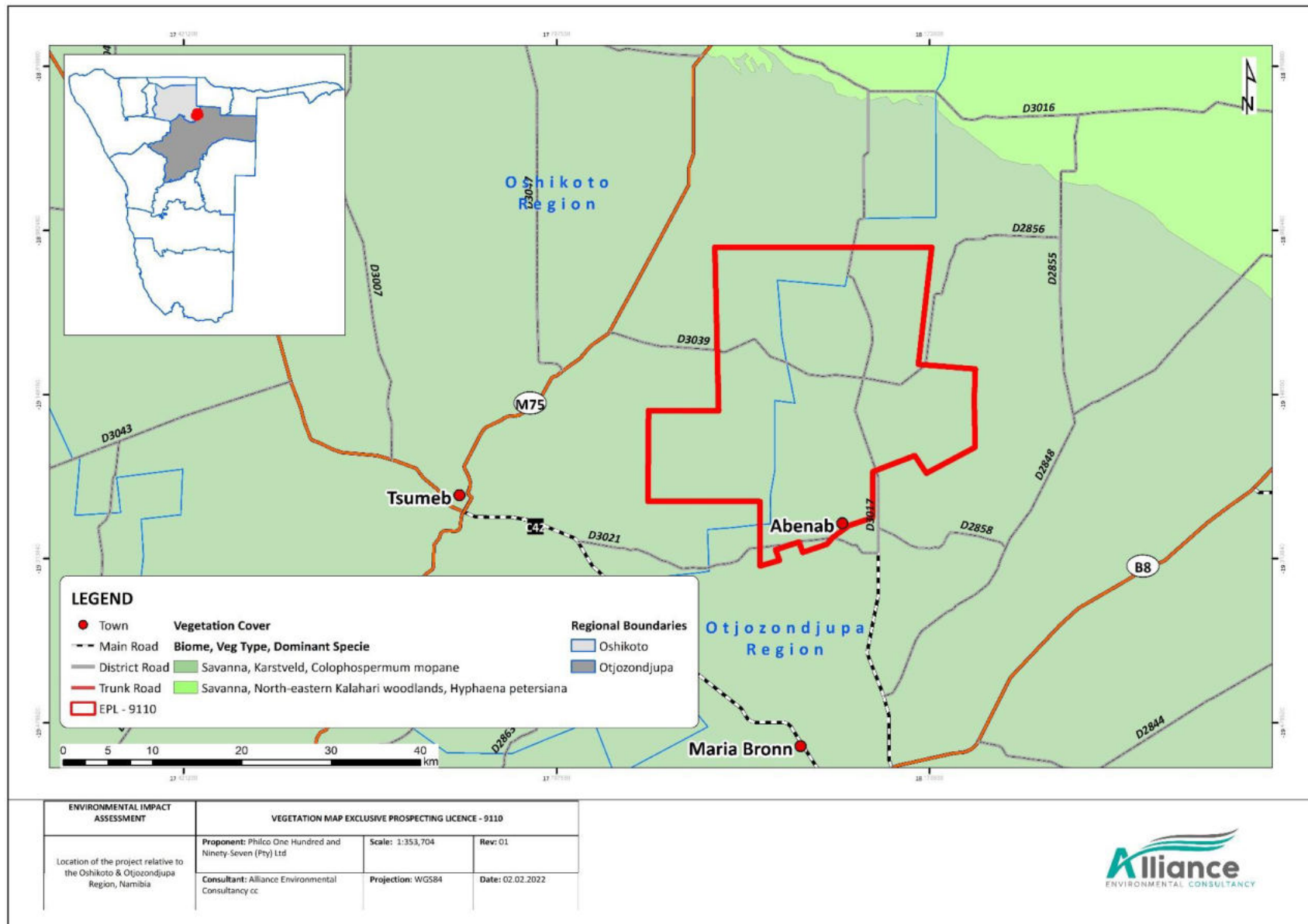


FIGURE 6 - VEGETATION OF THE PROJECT SITE

## 2. ENVIRONMENTAL MANAGEMENT PRINCIPLES

The Proponent will ensure that all project participants adhere to the following company goals:

- i. All employees will be obliged to undertake activities in an ecologically and socially responsible way. This applies to all consultants, workers, contractors, and subcontractors, as well as transporters, and visitors who are directly or indirectly requested by the Proponent to attend the work area as part of normal operations.
- ii. Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against dangers on site, potential hazards; and,
- iii. Promote good relationships with the surrounding settlements and other stakeholders.
- iv. Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
  - a. Prevent or minimize environmental impacts;
  - b. Minimize air, water, and soil pollution; and
  - c. Conserve Biodiversity.

In order to achieve the project's goal, the following principles must be followed:

TABLE 2 - EMP PRINCIPLES

| TERM                          | DESCRIPTION   |
|-------------------------------|---|
| Accountability and Commitment | The Company Senior Executives and Line managers will be held responsible and accountable for: <ul style="list-style-type: none"> <li>a. Health and safety of site personnel while on duty,</li> <li>b. Environmental impacts caused by exploration activities or by personnel engaged in the daily operations at the site.</li> </ul> |
| Competence                    | The company will ensure a competent workforce through appropriate selection, training, and awareness of all safety, health, and environmental matters.  |

| TERM  | DESCRIPTION  |
|---|--|
| Risk Assessment, Prevention, and Control    | Identify, assess and prioritize potential environmental risks. Prevent or minimize risks through careful planning and design, allocation of financial resources, management, and workplace procedures. Intervene promptly in the event of adverse impacts arising. |
| Performance and Evaluation                  | Set appropriate objectives and performance indicators. Comply with all laws, regulations, policies, and environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.  |
| Stakeholder Consultation                    | Create and maintain opportunities for constructive consultations with employees, authorities, and other interested or affected parties. Seek to achieve an open exchange of information and mutual understanding in matters of common concern.                     |
| Continual Improvement                       | Through continual evaluation, reports, and innovation, seek to improve performance regarding social health and well-being as well as environmental management throughout the lifespan of the project.  |
| Financial Provisions for project activities | In line with the internationally recognised "polluter pays principle" the company will make the necessary financial provision for compliance with the EMP.   |

### **3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT**

#### **3.1. COMMUNICATION BETWEEN PARTIES**

Emphasis will be put towards open communication between all parties, in order to reach a proactive approach towards potential environmental issues deriving from the project. This approach should guarantee that environmental impacts are anticipated and prevented, or minimized, rather than adopting a negative “policing” approach after negative impacts have already occurred.

The importance of a proactive approach cannot be over-emphasized, particularly in relation to preventing unnecessary tracks, and damage to vegetation (i.e., protected and endemic species) as these impacts cannot easily be remedied.

#### **3.2. THE EXPLORATION COMPANY**

The company is ultimately responsible for all stages of the project and the impacts resulting from those activities. The responsible persons will be the company’s appointed Environmental Control Officer (ECO), Project Manager (PM) and Managing Director (MD) to ensure that:

- The EMP and its environmental specifications are included in contractual documents, and it is required that contractors, and subcontractors, consultants etc. do meet the EMP requirements;
- The company and all its subcontractors, consultants etc. comply with all Namibian legislation and policies and any relevant International Conventions;
- Compliance with the environmental specifications is enforced on a day-to-day basis;
- Environmental audits are conducted periodically by a suitably qualified Environmental Control Officer ECO to confirm that the environmental requirements are properly understood and effectively implemented;
- Sufficient budget is provided to implement those measures that have cost implications;
- The PM must commission tree surveys well in advance of planned track creations so that the necessary site visits by forestry personnel and forestry permits are acquired; and
- Open and effective communication is maintained between all parties concerning environmental management on the project.

### 3.3. SITE/PROJECT MANAGERS

Day-to-day responsibility for environmental management will be assigned to the Site/Project Manager as well as the Environmental Control Officer (ECO) for the duration of the project to:

- Be familiar with the contents of the EMP and applicable sections of the EIA and the measures recommended therein.
- Monitor compliance with the environmental specifications on a daily basis and enforce the environmental compliance on-site by communicating the ECO's directions to all personnel involved; In the event of any infringements leading to environmental damage, personnel need to consult with the ECO and seek advice on any remedial measures to limit or rectify the damage.
- Maintain a record (photographic and written) of "before-and-after" conditions on site.
- Facilitate communication between all role players in the interests of effective environmental management.

### 3.4. ENVIRONMENTAL CONTROL OFFICER (ECO)

The proponent must appoint a suitably qualified ECO who is responsible to:

- Undertake environmental audits of overall compliance with the environmental specifications. This should be done at least bi-annually for the project area.
- Submit a site inspection report to the Managing Director.
- Advise the MD on interpretation and implementation of the environmental specifications as required; and,
- Make recommendations for remedial action in cases of non-compliance with the environmental specifications.
- The report should be submitted to the MEFT periodically at the time interval stipulated by law.

### 3.5. CONTRACTORS

The contractors will have the responsibility to:

- Familiarize themselves with the requirements of the EMP and comply with the environmental specifications within.
- Notify the ECO through the MD timeously in advance of any actions that might have significant negative impacts. Mitigatory measures should be discussed and implemented before negative impacts arise. Conduct or arrange for environmental training for employees and subcontractors.
- Undertake rehabilitation measures where required as far as possible, rehabilitation measures should be carried out progressively and not left till the end of the project.

## **4. ENVIRONMENTAL SPECIFICATIONS**

The activities will be conducted in an environmentally and socially responsible manner. The contractor and all personnel on-site will comply with the environmental specifications contained in this section.

### **4.1. TRAINING AND AWARENESS**

All site personnel and site contractors will receive the training to equip them with the necessary knowledge to comply with the environmental specifications. The MD will ensure that an appropriate level of training is provided at all levels of site personnel.

### **4.2. STAKEHOLDER RELATIONS**

All site personnel will endeavor to maintain good relations with the landowners and members of the public. Any complaints received by the ECO should be recorded and will be addressed.

### **4.3. PERMITS**

All relevant permits shall be obtained from relevant authorities.

The removal or relocation of rare and endangered plants will be conserved and should it be removed or relocated it shall be done with the required permits from the Directorate of Forestry.

### **4.4. ROAD SAFETY**

The access roads can be dangerous at times due to dust from passing vehicles, poor camber, patches of loose sand, careless drivers, animals and other external factors. All drivers must be aware of these hazards and take precautions to avoid them. Such precautions will include, but not be limited to:

- Complying with speed limits.
- Reducing speed considerably when visibility is poor.
- Being wary of other vehicles.
- Travelling with lights on even in daylight.
- Slowing down for animals and birds on the road; and,
- Being cautious of other road users– taking into account reduced visibility due to dust.



#### 4.5. ACCESS TRACKS

- The proponent will predominantly use existing tracks, and any new tracks or extensions should be established with the permission of the landowners and the Department of Forestry DoF when necessary (if larger areas require clearing).
- The selected access and site roads will be clearly marked. A single road only will be used to and from each destination. Turning points for vehicles will also be pre-selected and marked.
- Particular care will be taken to avoid damage to plants.
- Any elevated sites, or sites away from existing tracks, will be accessed on foot rather than by a vehicle.

#### 4.6. CONSERVATION OF BIODIVERSITY

- Damage to protected species will be avoided at all costs. The list of plant species that could potentially occur in the area and their status in terms of sensitivity is presented in the scoping report for reference (Appendix E).

#### 4.7. WILDLIFE POACHING

**NB: It is an offence to poach wildlife.**

No animal or bird is to be captured, killed or harmed in any way. Anyone caught violating this law will face suspension from the project and could be liable for prosecution. In a likewise manner, domestic livestock on farms may also not be harmed.

#### 4.8. SOIL MANAGEMENT AND EROSION CONTROL

- During any excavating and clearing the Contractor shall take care to remove as little topsoil as possible. All soil within 100mm of the cleared surface level shall be regarded as topsoil.
- Remove and separately stockpile any subsoil material that can be used for site backfilling.
- Avoid handling soil when wet as this may result in the loss of soil structure and compaction. Soils should not be handled during windy conditions, which may lead to the loss of soil through wind erosion.
- Soil erosion must be prevented at all times. Where evidence of soil erosion can and/or is taking place, this should be reported by the Contractor to the Project Manager (PM) or ECO.
- Unnecessary compaction of construction areas must be prevented, to reduce runoff velocity.

## 4.9. POLLUTION CONTROL

### 4.9.1. Spillage Incidents

- Should any incident occur in terms of spilling, they shall report it immediately to the PM and the Contractor shall be responsible for containing and cleaning up the spillage. The Contractor shall ensure that correct mitigation of the pollution is undertaken.

### 4.9.2. Air pollution / Dust emission

- Soil and sand stockpiles shall be located in sheltered areas not exposed to the wind.
- Retention of vegetation where possible will reduce dust travel.
- Exposed surfaces must be re-vegetated as soon as possible.
- The movement of vehicles and other vehicles should be strictly controlled in order to reduce the impact of increased air pollution.
- Adherence to speed limits shall be enforced.
- Ensure sensible and responsible use of equipment which generates dust.
- Limit operations during dusty working weather conditions.
- Vehicles and operating equipment must be regularly serviced.

### 4.9.3. Noise pollution

- Noise levels shall be kept within acceptable limits. All noise and sounds generated shall adhere to SABS 0103 specifications for maximum allowable noise levels for residential/communal areas.
- Noisy activities must be limited to between 06h00 to 19h00 to avoid disturbance towards adjacent landowners.
- Noisy activities should not be allowed on weekends and public holidays unless specific arrangements have been made with the proponent and provided that neighbors have been timeously notified.
- Vehicles and operating equipment must be regularly serviced.

## 4.10. WASTE MANAGEMENT

- The area needs to be kept clean, neat, and tidy to the satisfaction of the proponent and ECO. The proponent will provide bins at the worksites and will be responsible for the collection and containment of daily refuse and waste generated by staff. Bins will be secured in such a way that wind cannot remove papers and plastics. Bins will also be secured against animals around the vicinity.

- No waste will be buried/burnt on site. All waste will regularly be removed to an approved waste disposal facility (Tsumeb).

#### 4.11. HAZARDOUS SUBSTANCES

- All containers of fuel, oil, and any other hazardous substances will be kept sealed, and clearly labeled for identification.
- Tanks for fuels, oils, and any other hazardous substances need to be bunded to hold 110% of the capacity of the tank to contain any possible spills.
- If any spills occur, clean-up shall occur immediately and disposed of appropriately.

#### 4.12. FIRE PREVENTION

- Ensure an Emergency Response Plan.
- No fires are to be left unattended.
- Charcoal sourced from the surrounding should be 100% cured to avoid combustion.

#### 4.13. ARCHAEOLOGICAL SITES

- All archaeological remains are protected under the National Heritage Act (2004) and are not to be destroyed, disturbed, or removed. The Act also requires that any archaeological finds be reported to the Heritage Council Windhoek (**Tel. 061-244375**). The same applies to rock art sites.
- The ECO will be notified without delay of any archaeological finds.

#### 4.14. HEALTH AND SAFETY

All company personnel will receive a detailed induction upon joining the project. The PM and/or ECO will ensure regular safety 'tool box' meetings are carried out at the site in order to maintain safety awareness and to inform staff of any changes or developments pertaining to safe operations since the last induction/meeting. These meetings and inductions will be recorded and will include all names of staff present and any follow-up or action required from the meeting.

- **Dust:** All staff will receive dust masks and proper PPE to prevent inhalation of potential dust while carrying out any dust-producing activities associated with the project
- Eating, drinking, and **smoking** while working with any materials that may contain radioactive or hazardous substances is forbidden. Good personal hygiene is encouraged (e.g., washing hands before eating) to prevent ingestion of potentially hazardous or radioactive materials.
- **Bees:** Bee stings are potentially dangerous to persons who are allergic to them. Bees are attracted to water, so water / liquid should not be left standing.

- **Snakes & Scorpions:** A number of poisonous snake and scorpion species may occur in the area.

Therefore, precautions are required which include: -

- Exercising caution when picking up rocks or equipment from the ground.
- Looking at the ground when walking; and,
- Wearing closed shoes and not walking barefoot.

In case of emergency, ensure that Aspivenin (suction syringe) is permanently available at all workstations for the first aid treatment of snake bites, scorpion stings and bee stings. Antihistamine tablets should also be available for the first aid treatment of allergic reactions to bee stings.

TABLE 3 - EMERGENCY CONTACT NUMBERS IN TSUMEB

|                   |                |
|-------------------|----------------|
| Ambulance         | +264 67 221082 |
| Fire Brigade      | +264 67 221004 |
| Electricity       | +264 67 221056 |
| Hospital / Clinic | +264 67 221082 |
| Police            | +264 67 10111  |
| Water / Sewage    | +264 67 221056 |

#### 4.15. WORK STOPPAGE

The PM will have the right to order work to stop in the event of environmental specification infringements that could result in damage to plants, wildlife, or personnel. Work will continue once the situation is rectified and brought to a state of compliance.

#### 4.16. COMPLIANCE MONITORING

Where necessary during exploration activities, the company ECO will conduct regular site compliance inspections. After each inspection the ECO will compile an EMP compliance report for submission to the PM and biannually to the MEFT or as required.

## 5. MITIGATION MEASURES

The purpose of the Environmental Management Plan is to provide a detailed plan to mitigate the negative and positive impacts identified in the environmental scoping and assessment report. Furthermore, it aims to provide actions with roles and responsibilities to implement the environmental specifications provided for to the proponent, contractors, subcontractors who will undertake exploration activities.

The following table provides a large-scale summary overview of all the major environmental management aspects. The scoping study submitted with this EMP also provides mitigation measures for impacts identified therein under **Chapter 9**.

TABLE 4 – EMP MITIGATION MEASURES

| Aspect  | MANAGEMENT DETAILS  | RESPONSIBLE PERSONS                               | FREQUENCY |
|---|---|---|-----------|
| <b>Access Control</b>                                     | <ul style="list-style-type: none"> <li>• Make use of existing tracks/roads as much as possible throughout the area.</li> <li>• Only drive along the existing tracks and avoid unnecessary drives around the area as it may harm vertebrate fauna and unique flora and may also cause erosion related problems, etc.</li> <li>• Avoid off-road driving at night as this increases mortality of nocturnal species.</li> <li>• Implement and maintain off-road track discipline with maximum speed limits (30km/h or as otherwise specified by the PM)</li> <li>• Where tracks must be made to potential exploration sites off the main routes, the routes should be selected along already disturbed areas or where there is minimal biodiversity expected to occur.</li> <li>• Avoid placing tracks within drainage lines. Avoid collateral damage (i.e., select routes that do not require the unnecessary removal of trees/shrubs, especially protected species).</li> <li>• Rehabilitate all new tracks created if they will not be used by the community in the future.</li> </ul> | Contractor,<br>Project<br>Manager/Site<br>Manager | On-going  |
| <b>Establishing<br/>Camping<br/>and<br/>storage Areas</b> | <ul style="list-style-type: none"> <li>• Establishment of the supporting project infrastructure should be done on an area with the least disturbance to the environment and within the non-sensitive areas.</li> <li>• Choice of location for storage areas must take into consideration prevailing winds, distance to water bodies and general on-site topography.</li> <li>• Storage areas must be designated, demarcated, and fenced if necessary.</li> <li>• Storage areas should be secure to minimize the risk of crime.</li> <li>• They should be safe from access by children and animals etc.</li> <li>• Fire prevention/fighting tools must be present at all storage facilities.</li> </ul>  | Contractor,<br>Project<br>Manager/Site<br>Manager | On-going  |

| Aspect   | MANAGEMENT DETAILS  | RESPONSIBLE PERSONS   | FREQUENCY                                 |
|--|---|---|---|
| <p><b>Establishing Storage Areas</b></p>                               | <p><u><b>Hazardous Material Storage</b></u></p> <ul style="list-style-type: none"> <li>• Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are diesel, petroleum, oil, bitumen, cement, solvent-based paints, lubricants, explosives, drilling fluids.</li> <li>• Material safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes.</li> <li>• Hazardous storage areas must be 110% bunded with an impermeable liner to protect groundwater and soil from contamination. The Contractor shall submit a method statement to the Project Manager for approval.</li> <li>• Storage areas containing hazardous substance materials must be clearly sign posted.</li> </ul> | <p>Environmental Control Officer(ECO),<br/>Proponent</p>                                  |   |
| <p><b>Education Of Site Staff on General Environmental Conduct</b></p> | <p><u><b>Environmental Education and Awareness</b></u></p> <ul style="list-style-type: none"> <li>• Ensure that all site personnel have a basic level of environmental awareness training. The proponent must submit a proposal for this training to the ECO for approval. Topics to be covered should include:                             <ul style="list-style-type: none"> <li>○ What is meant by “environment”.</li> <li>○ Why the environment needs to be protected and conserved.</li> <li>○ How construction activities can impact on the environment.</li> <li>○ What can be done to mitigate against such impacts.</li> </ul> </li> </ul>   | <p>Project Manager/Site Manager<br/>Environmental Control Officer(ECO),<br/>Proponent</p> | <p>During staff induction and ongoing</p> |

| Aspect   | MANAGEMENT DETAILS   | RESPONSIBLE PERSONS   | FREQUENCY                                 |
|--|--|---|---|
|  | <ul style="list-style-type: none"> <li>○ Awareness of emergency and spills response provisions.</li> <li>○ Social responsibility during operations, e.g., being considerate to local residents.</li> <li>● It is the proponent's responsibility to provide the site with the appropriate level of environmental training and to ensure that there is sufficient understanding to pass this information onto anyone operating at the site.</li> <li>● The need for a 'clean site' policy also needs to be explained to all workers.</li> </ul>  |   |   |
| <p><b>Education Of Site Staff on General Environmental Conduct</b></p> | <p><u><b>Workers Conduct on site.</b></u></p> <ul style="list-style-type: none"> <li>● A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules:</li> <li>● No alcohol / drugs to be present on site.</li> <li>● No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).</li> <li>● Prevent excessive noise.</li> <li>● Prevent unsocial behavior.</li> <li>● Bringing pets onto the site is forbidden.</li> <li>● No harvesting of firewood from the site or from the adjacent areas.</li> <li>● Staff are to make use of the facilities provided for them, as apposed to ad-hoc alternatives, (e.g., fires for cooking, the use of surrounding areas / bush as a toilet is forbidden).</li> <li>● Trespassing on private / commercial properties adjoining the site is forbidden.</li> <li>● Driving under the influence of alcohol is prohibited.</li> </ul> | <p>Proponent,<br/>Employees,<br/>Environmental Control Officer(ECO)</p> | <p>During staff induction and ongoing</p> |



| Aspect                | MANAGEMENT DETAILS   | RESPONSIBLE PERSONS                      | FREQUENCY                          |
|-----------------------|--|--|------------------------------------|
| <b>Social Impacts</b> | <ul style="list-style-type: none"> <li>• Avoid exacerbating the influx of unemployed people to the area and address the unrealistic expectations about large numbers of jobs would be created.</li> <li>• Develop a standardized recruitment method for sub-contractor and field workers.</li> <li>• The employment of local residents and local companies should be a priority.</li> <li>• Camp if required should be established in close consultation with the landowners.</li> <li>• Accommodation camp should consider provision of basic services.</li> <li>• Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the project area. Disciplinary actions should be in accordance with Namibian legislation.</li> <li>• Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyzer test upon request when reporting for duty daily.</li> <li>• Request that the Roads Authority erect warning signs of heavy operation vehicles on affected public roads.</li> <li>• Ensure that drivers adhere to speed limits and that speed limits are strictly enforced.</li> <li>• Ensure that vehicles are road worthy, and drivers are qualified.</li> <li>• Train drivers in potential safety issues.</li> </ul> | Contractor, Project Manager/Site Manager | During staff induction and ongoing |

| Aspect              | MANAGEMENT DETAILS   | RESPONSIBLE PERSONS                                      | FREQUENCY |
|---------------------|--|--|-----------|
| <b>Biodiversity</b> | <p><b><u>Fauna and Flora</u></b></p> <ul style="list-style-type: none"> <li>No protected vegetation may be cleared without prior permission from the forestry department.</li> <li>Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas.</li> <li>Disturbance to birds, animals and reptiles and their habitats should be minimized wherever possible.</li> <li>Avoid unnecessarily affecting areas viewed as important habitat.</li> <li>Avoid off-road driving at night as this increases mortality of nocturnal species.</li> <li>Implement and maintain off-road track discipline with maximum speed limits (e.g.,30km/h).</li> </ul>                                 | Employees, ECO, Contractor, Project Manager/Site Manager | Ongoing   |
| <b>Visual</b>       | <ul style="list-style-type: none"> <li>Consider the landscape character and the visual impacts of the area (including camp site) from all relevant viewing angles, particularly from public roads.</li> <li>Use vegetation screening where applicable. Do not cut down vegetation unnecessarily around the site and use it for site screening.</li> <li>Avoid the use of very high fencing.</li> <li>Minimise accessing roads or going off-road where it could result in land scarring .</li> <li>Minimise the presence of secondary structures: remove inoperative support structures.</li> <li>Remove all infrastructure and reclaim or rehabilitate the project site after project activities are completed.</li> </ul> | Contractor, Project Manager/Site Manager                 | Ongoing   |
| <b>Air Quality</b>  | <ul style="list-style-type: none"> <li>Dust suppression techniques should be employed, where possible, if the specific operation activity is likely to create dusty atmospheric conditions in excess of the periodic extremes.</li> </ul>  | Contractor, Project Manager/Site Manager, ECO            | Ongoing   |

| Aspect                                    | MANAGEMENT DETAILS   | RESPONSIBLE PERSONS                      | FREQUENCY |
|---|--|--|-----------|
|   | <ul style="list-style-type: none"> <li>Avoid activities that create excessive dust on extremely windy days.</li> <li>Personnel are required to wear personal protection equipment if excessive dust is created for prolonged working periods.</li> <li>When necessary and if exploration that results in the generation of dust is ongoing for a period of over 2 years continuously, establish a monthly dust monitoring exercise to collect the baseline dust conditions in the area before excessive activities such as mining commences.</li> </ul>  |  |           |
| <b>Noise</b>                              | <ul style="list-style-type: none"> <li>A grievance procedure will be established whereby noise complaints can be received, recorded, and responded to appropriately.</li> <li>Machineries and vehicles (moving and stationed) should be serviced regularly.</li> <li>A noise management standard operating procedure (SOP) for the activities happening on-site should be developed.</li> <li>Avoid creating unnecessary noise by making sure that equipment not in use are always turned off and by avoiding operations during odd hours.</li> <li>Fit sound mufflers on all machinery where applicable.</li> <li>Equip employees with appropriate PPE (noise reduction earplugs/earmuffs)</li> <li>Employees should work in shifts to avoid prolonged working hours and consequently prolonged exposure to noise.</li> </ul> | Contractor, Project Manager/Site Manager | Ongoing   |
| <b>Soil And Groundwater Contamination</b> | <ul style="list-style-type: none"> <li>Accidental spills that occur outside of the bund area must be contained and prevented from entering the stormwater system.</li> <li>Spills must be treated with the appropriate spill absorbent.</li> <li>Any significant spills or leak incidents must be reported in terms of the National Environmental Management Act and the Water Act.</li> </ul>   | Contractor, Project Manager/Site Manager | Ongoing   |

| Aspect   | MANAGEMENT DETAILS  | RESPONSIBLE PERSONS                             | FREQUENCY      |
|--|---|---|----------------|
| <p><b>Waste</b></p>  | <ul style="list-style-type: none"> <li>• The domestic waste, which is separated from all paper and organic materials, is taken to the nearest official dumpsite.</li> <li>• Oil from the servicing of the vehicles and machines is collected in drums and is taken together with all other industrial waste that is generated on site to the nearest hazardous waste site.</li> <li>• Storage areas that contain hazardous substances must be banded with an approved impermeable liner.</li> <li>• Bins and / or skips shall be provided at convenient intervals for disposal of waste within the project site.</li> <li>• Bins should have liner bags for efficient control and safe disposal of waste.</li> <li>• Recycling and the provision of separate waste receptacles for different types of waste should be encouraged.</li> <li>• Ensure good housekeeping.</li> </ul> <p><b><u>Ablutions</u></b></p> <ul style="list-style-type: none"> <li>• Waterless toilets are to be maintained in a clean state and should be moved to ensure that they adequately service the work areas.</li> <li>• The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility.</li> </ul> | <p>All personnel</p>                            | <p>Ongoing</p> |
| <p><b>Heritage sites destruction during exploration activities</b></p> | <ul style="list-style-type: none"> <li>• In addition, where possible, activities are to be aligned along previously disturbed areas. Habitats surrounding the washes (rivers) may host sensitive plant species which require permits for removal to avoid destruction. No wandering around the site, collecting of plant species or hunting should be allowed.</li> <li>• A 'chance find' of any potential heritage site should be communicated to the police and the National Heritage Council of Namibia.</li> <li>• If activities occur at the location where a 'chance find' has been made, then the</li> </ul>   | <p>Contractor, Project Manager/Site Manager</p> | <p>Ongoing</p> |

| Aspect                | MANAGEMENT DETAILS   | RESPONSIBLE PERSONS                      | FREQUENCY  |
|-----------------------|--|--|--|
|                       | <p>activities should cease until the necessary authorities have visited the site and provided the go ahead to proceed with activities.</p>   |  |  |
| <b>Rehabilitation</b> | <ul style="list-style-type: none"> <li>• Small samples are preferably removed from site to avoid additional scars in the landscape.</li> <li>• Litter from the site has been taken to the appropriate disposal site.</li> <li>• Debris, scrap metal, etc is removed before moving to a new site or on completion of the project work.</li> <li>• Water / Fuel tanks are dismantled and removed if not needed for further use.</li> <li>• Tracks on site and the access road are rehabilitated by smoothing the middle ridge between the tracks and raking the surface unless the owner/farmer has provided the proponent a request in writing to retain the track(s)</li> <li>• if applicable the stockpiled subsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns.</li> <li>• Replace the stored topsoil seed bank layer.</li> </ul> | Contractor, Project Manager/Site Manager | Progressively and prior ceasing project activities |

## 6. MONITORING PLAN

The project monitoring is conducted under the EMP includes:

- (i) **EMP compliance monitoring** - To be conducted by the ECO to verify EMP compliance during project implementation especially if the program continues for over a period required for monitoring by MEFT.

## 7. CONCLUSION

This Environmental Management Plan highlights the management measures that will be implemented to mitigate the environmental impacts of the proposed activities. Additionally, it highlights the need / requirements for the Environmental Emergency Preparedness and Response procedure.

The EMP is a legal document, which commits the applicant to comply with all management measures, monitoring programmes and other plans as presented herein. As part of the EMP, monitoring programmes have been provided to manage and control critical components of the environment. This is a live document which may be amended if project activities alter.