

EXECUTIVE SUMMARY

1 INTRODUCTION

This Executive Summary summarises the Draft Environmental Impact Assessment (EIA) Scoping Report and Environmental Management Plan (EMP) prepared as part of the EIA process that is being undertaken for a proposed meteorological (met) mast and remote sensing campaign in the Tsau//Khaeb National Park (TKNP), near Lüderitz, southern Namibia.

1.1 PROJECT BACKGROUND

In November 2021, the Namibian government issued a notice of award stating its intention to appoint HYPHEN Hydrogen Energy (Pty) Ltd (Hyphen) as the preferred bidder to develop the country's first large-scale green hydrogen (H₂) project in two concession areas (namely Springbok and Dolphin) in the TKNP (see Figure 1).

The proposed green H₂ project will consist of 5-6 gigawatts (GW) of wind and solar renewable energy facilities, as well as support infrastructure comprising a desalination plant, an electrolyser, pipelines, powerlines, battery storage, access roads, single buoy mooring, etc. The project is forecast to produce 300 000 to 350 000 tons per annum (tpa) of green H₂, which will then be combined with nitrogen from the air to produce 1.7 million - 2 million tpa of green ammonia (NH₃) for the export market.

The bulk of the renewable electricity generation will be in the form of wind energy, which will be generated from wind turbines located within the two concession areas. To better understand the suitability of the wind resource in the identified development area, Hyphen is proposing to install 10 meteorological (met) masts and Light Detection and Ranging (LIDAR) remote sensors (LIDAR) in two locations as a means of secondary data collection. The proposed met masts and remote sensing campaign (the 'Project') will allow Hyphen to:

- Collect site specific wind resource data and refine its understanding of the wind resource characteristics, seasonality, and patterns; and
- Optimise the design (wind turbine type), number of turbines needed, and layout of the wind energy facility to ensure it operates as efficiently as possible, thereby maximising the project's generation capacity.

The proposed Project triggers Listed Activity 10.1(j) of the Environmental Impact Assessment (EIA) Regulations 2012 promulgated under the Environmental Management Act, 2007 (No. 7 of 2007), and as such requires an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT). An EIA process must be undertaken for MEFT to consider an ECC application.

SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR), an independent firm of environmental consultants, has been appointed by Hyphen to manage the ECC Application and undertake an EIA process (scoping with assessment) for the proposed met mast and remote sensing campaign. Please be advised that the larger green H₂ project will be subject to a separate EIA process. The current EIA process only deals with the proposed met mast and remote sensing campaign.

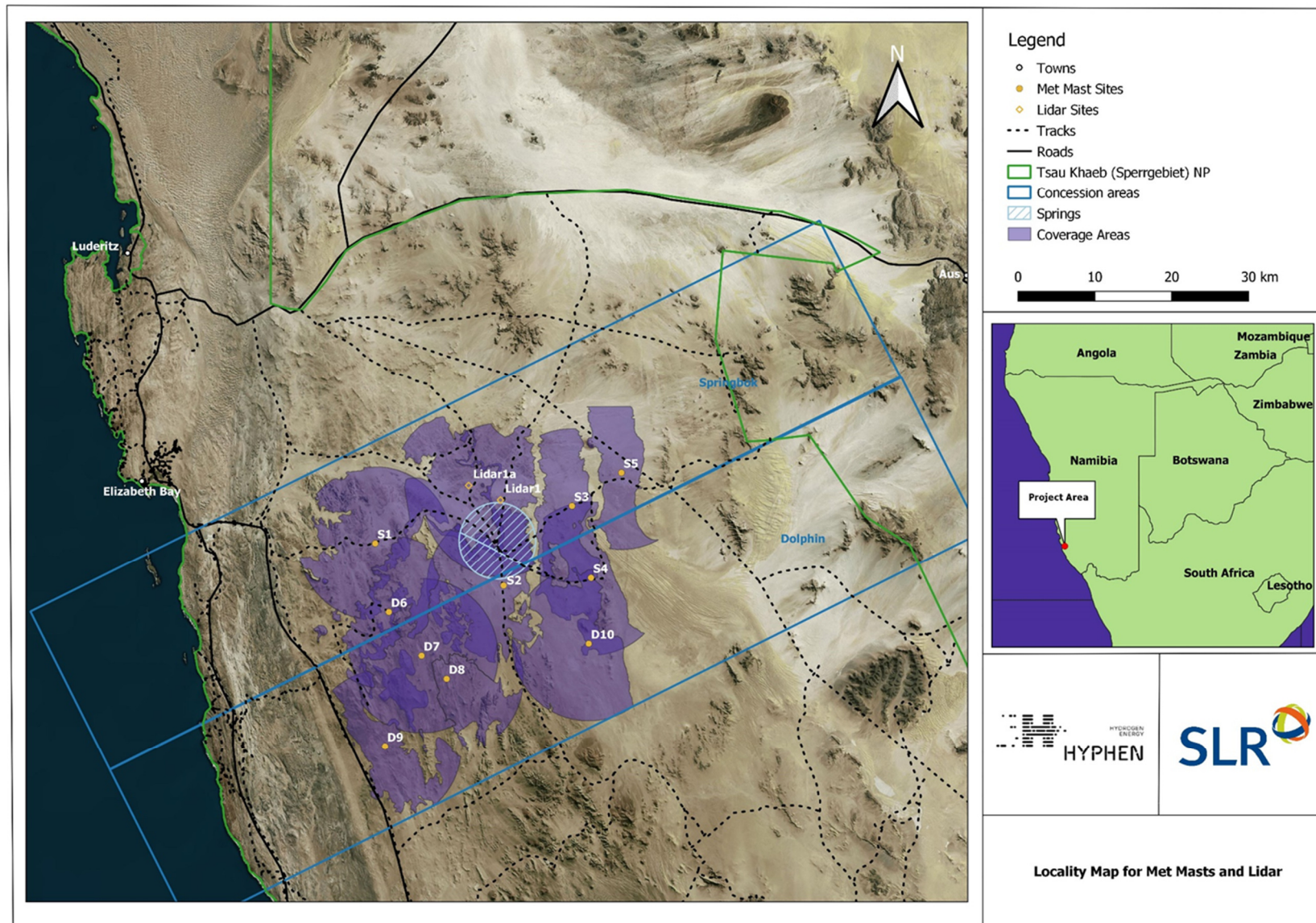


Figure 1: Locality map showing hyphen concession areas and proposed site locations in the Tsau//Khaeb National Park

1.2 OPPORTUNITY TO COMMENT

Interested and Affected Parties (I&APs) are asked to comment on the Draft EIA Scoping Report and EMP, which is being distributed for a 30-day comment period from **5 September to 5 October 2022**. For comments to be included in the Final EIA Scoping Report and EMP, they should reach SLR by **no later than 5 October 2022**.

SEND COMMENTS TO:

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Stakeholders are also invited to attend a public meeting in Lüderitz and an online meeting. Specific details of these meetings are provided in the I&AP notification letter.

Comments received on the draft report will be documented in a Comments and Responses Report. The draft report will be updated into a Final EIA Report and EMP, which will annex the Comments and Responses Report. The final report will be submitted to the Ministry of Mines and Energy (MME): Energy Directorate for consideration and review. In terms of Section 32 of the Environmental Management Act, 2007 (No. 7 of 2007), MME is then required to make a recommendation on the acceptance or rejection of the report to MEFT: Directorate of Environmental Affairs (DEA), who will make the final decision on the ECC application.

2 EIA PROCESS

The purpose of the EIA is to identify, assess and report on potential impacts the proposed project may have on the receiving environment. The EIA describes and analysis what the consequences of the project choices will be in terms of impacts on the natural and socio-economic environment and applying the Mitigation Hierarchy, identifies how such impacts can, as far as possible, be avoided, be enhanced or mitigated and controlled.

The EIA Regulations 2012 set out the procedures and documentation that need to be complied when undertaking an EIA process. The anticipated tasks and timing for the current EIA process (scoping with assessment) are presented in Figure 2.

2.1 INITIAL CONSULTATION AND DISCLOSURE

An initial round of public consultation and disclosure was undertaken to identify Interested and Affected Parties (I&APs) and develop the I&AP database, as well as obtain confirmation of the key issues and impacts for assessment. This involved the following:

- **Pre-Application Authority Meetings:** SLR and Hyphen held two online meetings with MME / MEFT and other key stakeholders. The purpose of these meetings was to introduce the project and EIA teams, provide notification of the commencement of the EIA process for the proposed project and to confirm the process to be followed.

- **Availability of Background Information Document (BID):** A notification letter and BID were released for a 21-day review and comment period from 20 April to 11 May 2022. The purpose of the BID was to convey information on the proposed project and EIA process, as well as to invite I&APs to register on the project database and provide initial comment on the proposed project and scope of the assessment.
- **Advertising and Site Notices:** Two sets of advertisements announcing the proposed project, the availability of the BID and the I&AP registration / comment period were placed in the following newspapers on 20 and 27 April 2022: (1) Republikein, the Sun and the Allgemeine Zeitung (in English and Afrikaans); and (2) The Namibian (in English). Site notices were placed at four locations in Lüderitz in English and Afrikaans, including the Lüderitz Public Library, Lüderitz Regional Council, Lüderitz Town Council and the Safari and Tours offices.

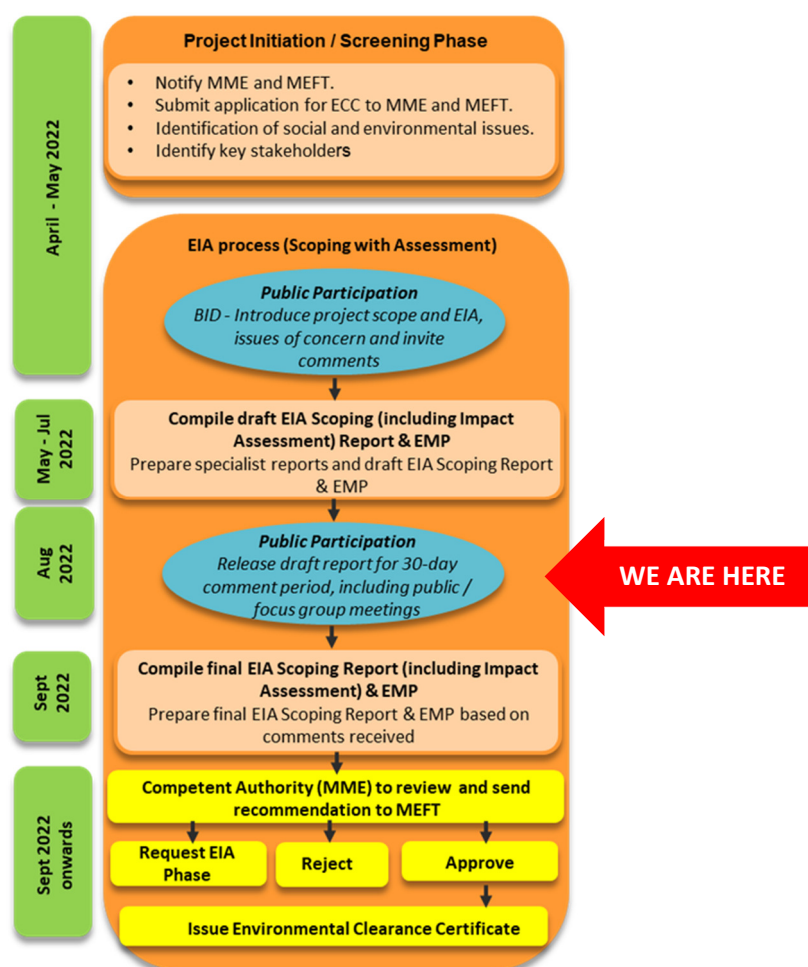


Figure 2: Outline of detailed steps in the EIA Process

2.2 SPECIALIST STUDIES AND SITE VISIT

Three specialist studies were commissioned to address the key issues associated with the proposed project. These included: (1) Terrestrial Ecology Assessment; (2) Avifaunal Assessment; and (3) Archaeological Assessment.

As part of these studies, a site visit was undertaken between 1 and 10 May 2022. Data collected was used by specialists to describe their respective baseline receiving environments, identify and assess environmental impacts that may occur as a result of the proposed project, and recommend appropriate mitigation enhancement measures (including proposing alternative routes to access the sites).

2.3 COMPILATION AND REVIEW OF DRAFT EIA SCOPING REPORT AND EMP

The Draft EIA Scoping Report and EMP has been prepared in compliance with Section 8 and 15(2) of the EIA Regulations 2012. The specialist findings on the impact assessment, recommended mitigation, as well as other relevant information, have been integrated into this report and provides further opportunity for I&APs to comment on the proposed project and draft findings of the EIA.

The following steps are envisaged for the remainder of the EIA:

- After closure of the comment period on the Draft EIA Scoping Report and EMP, the draft report will be updated into a final report. All comments received will be incorporated and responded to in a Comments and Responses Report, which will be appended to the final report.
- The Final EIA Scoping Report and EMP will be submitted to MME for consideration and review. MME will then forward it with a recommendation to MEFT for a decision on the ECC application.
- The decision taken by MEFT will be distributed to all I&APs registered on the project database.

3 PROJECT OVERVIEW

3.1 MET MASTS

The met masts will be located within Hyphen's two concession areas (namely Springbok and Dolphin) in the TKNP. Due to the extent of and changing elevation within the identified development area, 10 met masts are proposed each representing a specific wind resource coverage area (Figure 1).

Met masts are typically tall lattice structures with measuring instrumentation installed at various heights (Figure 3a). The type of mast proposed is a triangular steel lattice mast with a maximum structure height of up to 120 m and held in place by guy wires (cable stays) to anchor the mast. Each met mast foundation occupies an area of approximately 1.5 m² but maybe larger depending on the site geotechnical conditions (Figure 3b).

To stabilise the met masts, each mast will have 12 ground anchors. The guy wires attach the met mast tower to the ground at different heights. Guys wires are attached to the mast from three directions and the anchors are spaced at 40 m, 60 m, 70 m and 80 m from the centre of the mast.

Instruments will be installed at various heights on the met mast. Typical instruments that are installed on each mast include: anemometers, wind vanes, pressure sensors, temperature sensors, and humidity sensors.

3.2 LIDAR REMOTE SENSING

The LIDAR will be located at two sites within the identified development area each representing a specific coverage area (Figure 1).

The LIDAR remote sensing method is used to measure vertical wind profiles at higher elevations (up to 200 m). This method works by transmitting short pulses of infrared laser light into the atmosphere. These beams hit particles and aerosols in the air, which scatter a small fraction of that light energy back to the sensor. Data will be used to supplement the met mast data in mapping the wind speed and direction, turbulence and wind shear.

Unlike the met masts, the LIDAR sensor is mobile (Figure 4) and will moved from one site to another to further reduce wind resource uncertainty.

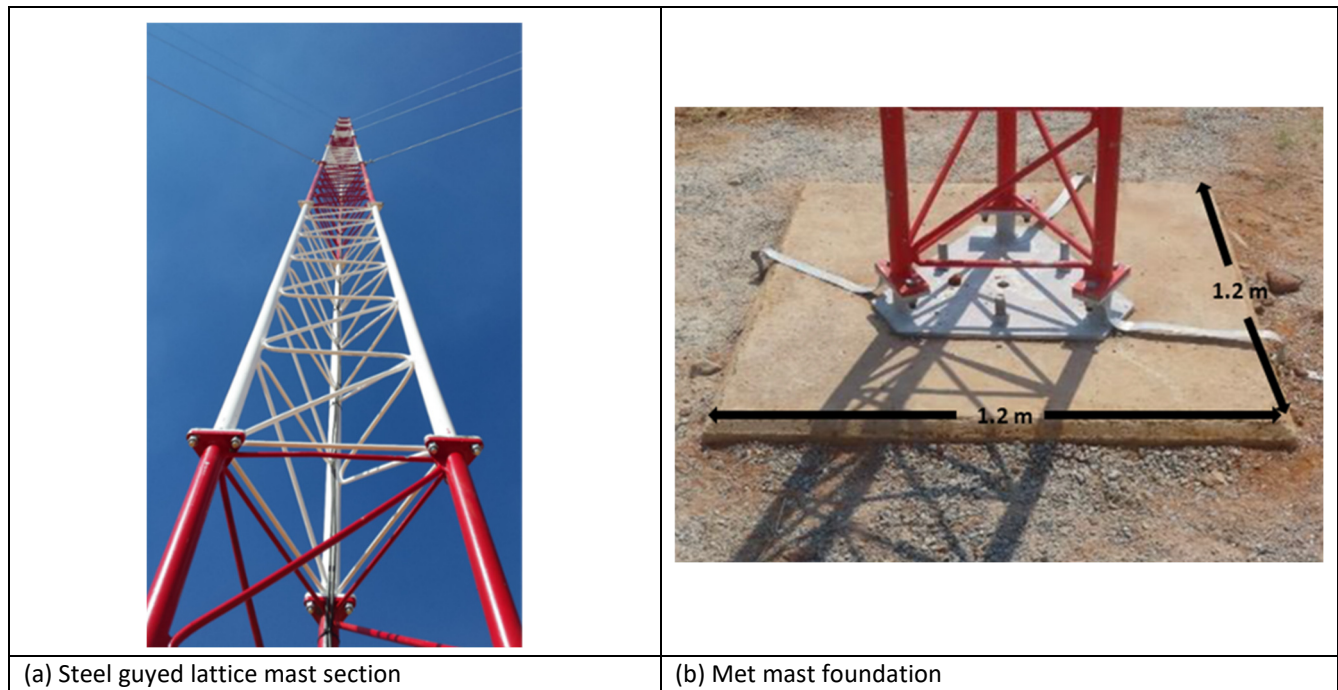


Figure 3: Met Mast



Figure 4: Examples of mobile LIDAR

3.3 SITE ACCESS

Initial access routes were identified using existing tracks, where possible. However, new tracks were required to access the more remote sites, which were identified in the field by the specialists in consultation with MEFT during the May 2022 site visit. After the site visit, the initial route network was amended by the specialists, in consultation with MEFT, in order to avoid various sensitive areas, including the Kaukausib spring area, although many of these were existing tracks. The final proposed access route network is presented in Figure 5.

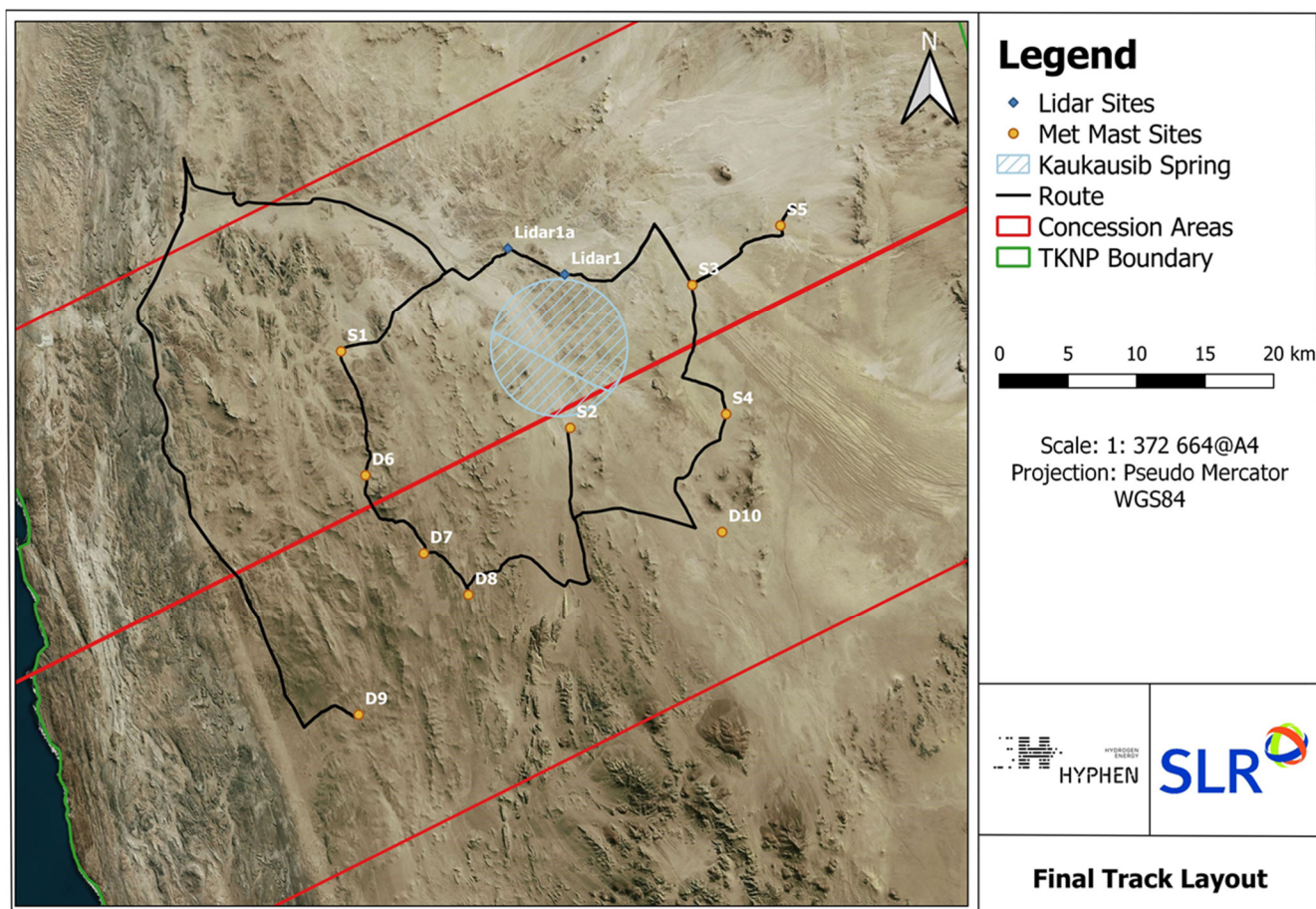


Figure 5: Final Access Route Layout

3.4 EQUIPMENT MAINTENANCE

Four maintenance visits will be undertaken for each met mast over a 12-month period. Masts could remain on site for the duration of the larger green H₂ project wind farm, decommissioned or repositioned / reused to serve as the wind farms operational met masts. Decommissioning will involve dismantling and removal, and the materials reused or recycled where possible. LIDARs are typically located at a position for a minimum of 6 months before being moved to another location or being removed from site.

4 SUMMARY OF BASELINE INFORMATION

This section provides a brief description of the attributes of the receiving environment in the project area.

Receptor/ Variable	Description Summary
1. Bio-Physical Considerations	
Climate	- Namibia is one of the largest and driest countries in sub-Saharan Africa. In general, the country is hot and dry with sparse and erratic rainfall. Most of the country is defined as very arid, arid, or semi-arid, with two deserts, namely the Kalahari and Namib, covering large portions of the west and east of the country, respectively. - Given Namibia's world-class renewable resources (wind and solar), abundant land availability, and proximity to the ocean, the project area lends itself to the potential development of renewable energy projects.

Receptor/ Variable	Description Summary
Vegetation	- The vegetation of the TKNP forms the northernmost portion of the Succulent Karoo Biome, which is a biodiversity hotspot and of international conservation importance. - The vegetation in the project areas is dominated by dwarf shrubs of various species and the shrub <i>Euphorbia gummifera</i>. In the broader context the proposed met mast and LIDAR sites are placed in Kaukausib-drainage dwarf shrubland, northern gravel and sand plain grassland, <i>Euphorbia</i> shrubland and Western Klinghardt-plain shrubland (Figure 6). - Approximately 90 plant species were recorded during the field work, of which 23 are of conservation importance (25%) either by being legally protected, red-listed or CITES-listed. Seven species are endemic to the Sperrgebiet.
Terrestrial Fauna	- Distribution and abundance of terrestrial fauna across the project area is poorly known. Mammals such as springbok, oryx, brown hyena, black-backed jackal, bat-eared fox, and cape fox occur in low abundance, but are known to move through the area, and are more likely to be found near water sources such as the Kaukausib Spring. A few amphibians and reptiles are endemic or near-endemic to the desert regions of Namibia including Desert rain frog, Nama dwarf tortoise, and Namaqua dwarf adder, which may occur in the project area. - A total of 14 reptile and six mammal species were confirmed during fieldwork, none of which are globally threatened and only hyena which is near-threatened.
Avifauna	- Due to the harsh climatic conditions, avian abundance and diversity are expected to be extremely poor in the broader project area. The occurrence, abundance, richness, and diversity of birdlife in the broader project area are largely dictated by regional rainfall patterns. Years of poor local rainfall may yield extremely few birds, while good local rainfall events may draw birds that are not necessarily desert-adapted from inland areas further west. - Out of the 49 listed bird species known (or suspected) to occur in the broader project area, five species were identified as priority species, namely Ludwig's Bustard, Barlow's Lark, Gray's Lark, Greater Flamingo and Lesser Flamingo. - During the field survey in May 2022 (dry conditions), a total of 30 bird species were identified, including the Barlow's Lark and Gray's Lark.
Biodiversity Sensitivity	Eleven of the measurement sites are located in areas with "medium biodiversity" sensitivity and one site within an area of "high biodiversity" sensitivity, as defined by the TKNP Management Plan (Figure 7).
2. Socio-Economic Considerations	
Mining	- Diamonds (and zinc more recently) have been mined in the TKNP for more than a century particularly in the //Kharas Region. - Five of the measurement sites are located withing existing Exclusive Prospecting Licence (EPL) and Mining Licence (ML) areas (Figure 8).
Tourism	A number of tourism concessions have been issued for parts of the TKNP; the only one relevant to the current project is the Aus-Lüderitz Link Tourism Development Area (TDA). Four measurement sites overlap with the Aus-Lüderitz Link TDA (Figure 9).
Archaeology	- A total of 29 archaeological sites were located during the May 2022 site survey. These included ten with historic material, two with ESA artefacts, 13 with MSA artefacts, 12 with LSA artefacts, eight with ostrich eggshell fragments, one with decorated ostrich eggshell fragments, one with ostrich eggshell beads, two with land snail, four with grindstones, nine with rock shelters, one with pottery and one with charcoal artefacts. - None of the twelve measure sites nor the access routes leading to these sites impacted on any of these archaeological or historical sites.

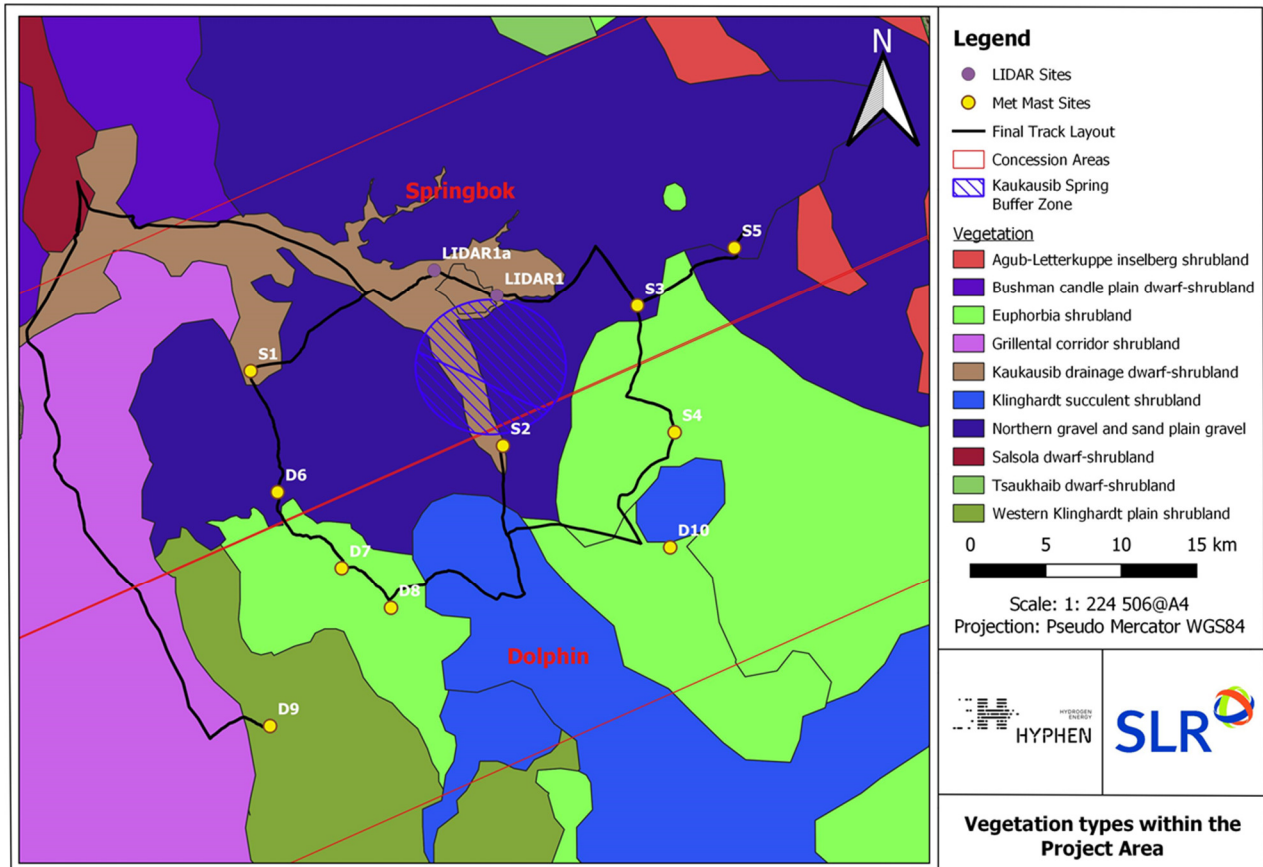


Figure 6: Vegetation Types. Source: Burke 2006; MEFT 2019; MEFT 2020a

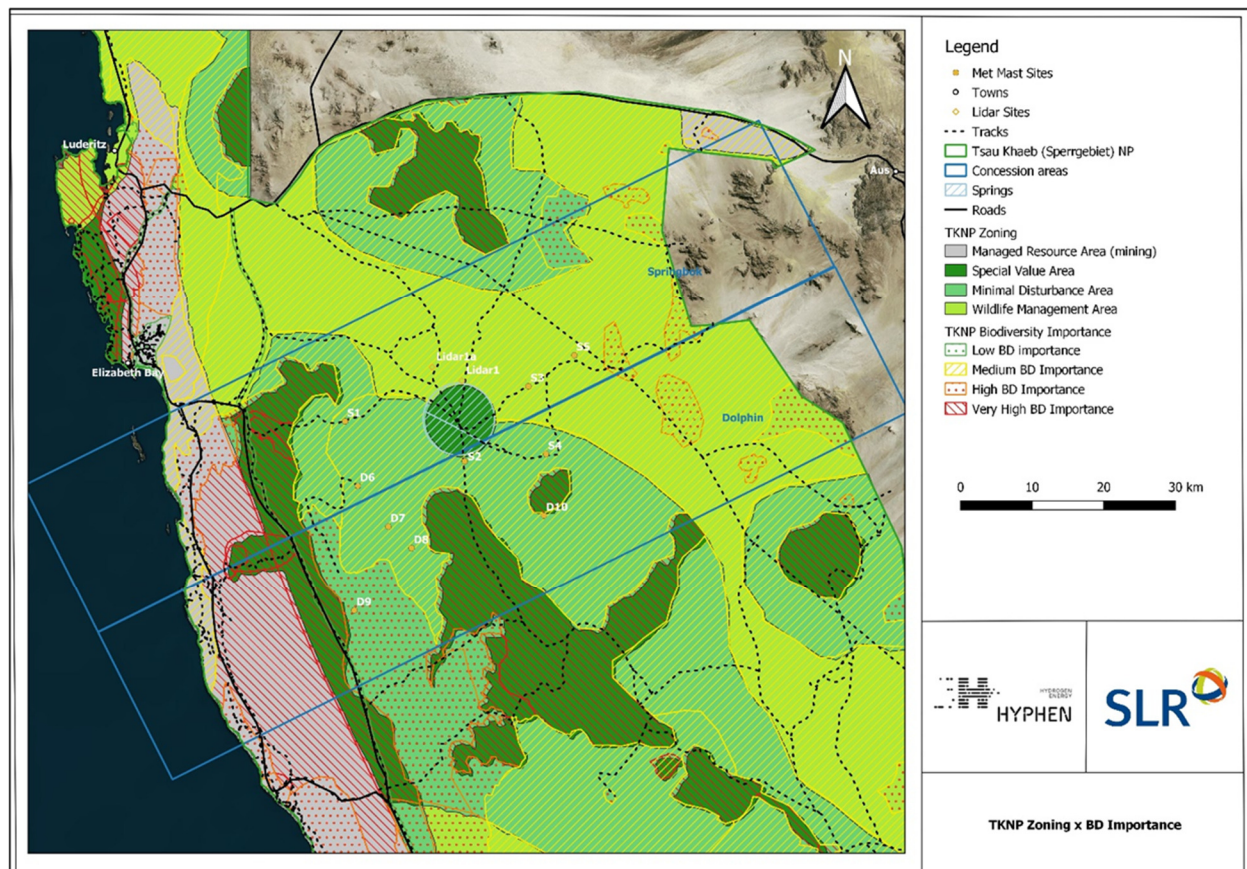


Figure 7: TKNP Zoning Map and Biodiversity Importance. Source: Burke 2006, MEFT 2019, 2020a

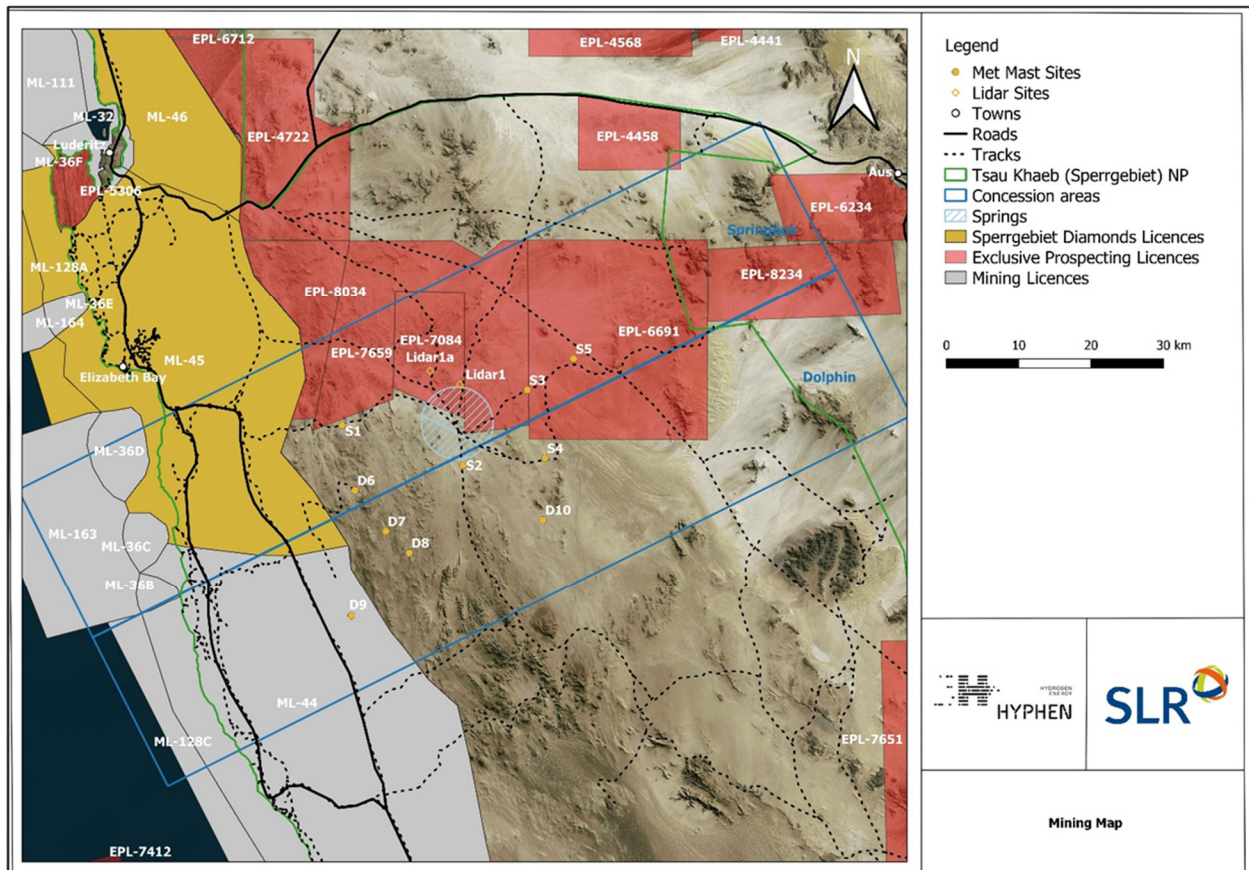


Figure 6: Mining Licenses and EPL Areas Map. Source: Namibia Mining Cadastre Map Portal 2022

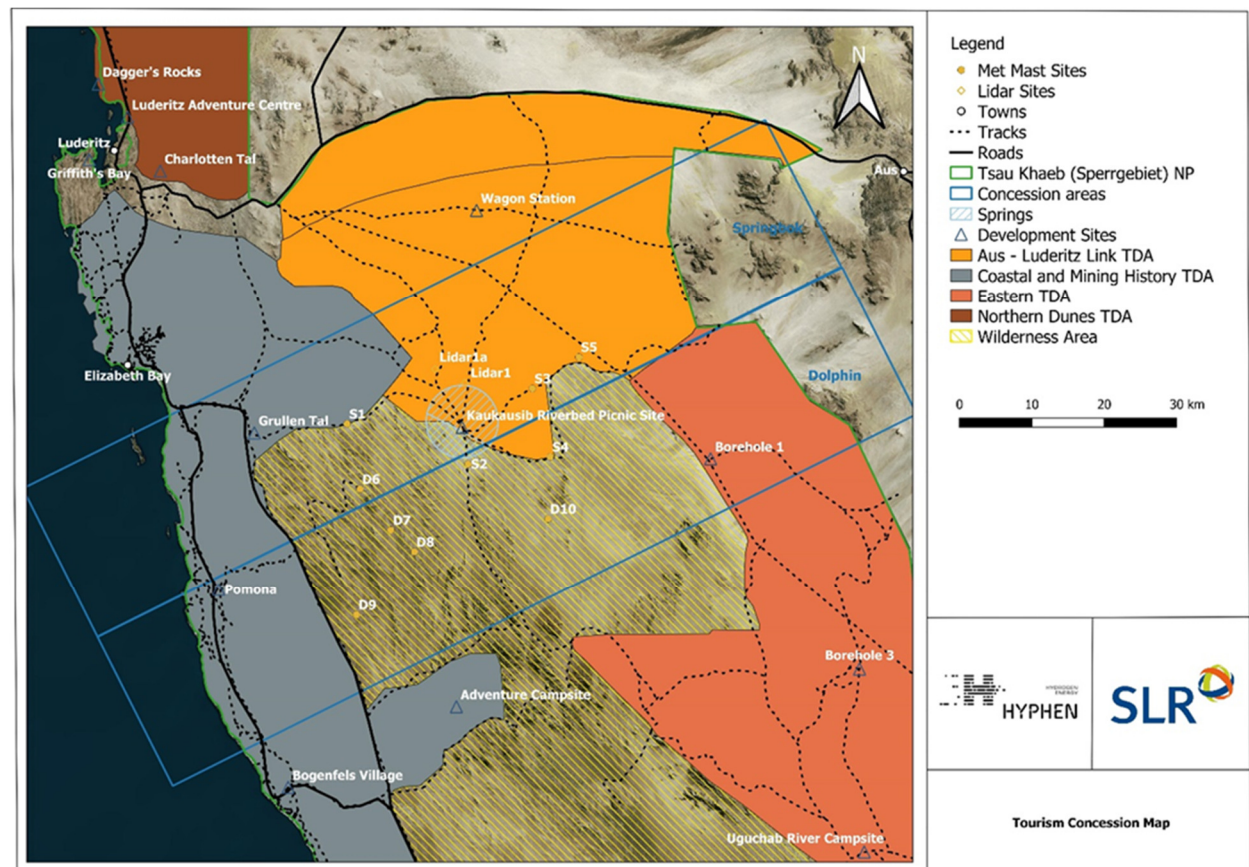


Figure 9: Tourism Concession Map. Source: MEFT 2020b

5 IMPACT ASSESSMENT AND MITIGATION SUMMARY

A summary of the assessment of potential impacts and proposed mitigation associated with the three specialist studies provided in Table 1 overleaf. The most significant impacts are related to the:

- Physical removal and disturbance of vegetation and soil, which would result in the direct loss of vegetation and faunal habitat, as well as the disturbance to terrestrial fauna (including avifauna): The vegetation of the TKNP forms the northernmost portion of the Succulent Karoo Biome, which is a biodiversity hotspot and of international conservation importance. The project area is currently in a largely undisturbed and pristine state, which provides a sanctuary for a host of life forms, including those that are adapted to the harsh arid and windy conditions that prevail. Some of these life forms are restricted to these desert habitats and, therefore, have a narrow distribution range, and are thus sensitive to disturbance.

The potential impact terrestrial ecology and avifauna as a result of vegetation removal and disturbance have, however, been largely mitigated by the careful siting of met mast sites and access routes to avoid sensitive areas. All met mast sites were selected so as to avoid areas of very high biodiversity (as defined by the TKNP Management Plan), as well as avoiding highly sensitive habitats such as on ridges, inselbergs and springs. The access tracks were also amended, in consultation with the specialists and MEFT, to avoid various sensitive areas, including the Kaukausib spring area. The impact as a result of vegetation removal and disturbance is considered to be of **LOW significance** after mitigation. Thus, it is important to ensure that the demarcated construction footprint (at each met mast site) and final agreed access routes are adhered to all times.

- Bird collision mortality and injury due to the presence of the met masts and guy wires: Met masts and supporting guy wires present an unnatural obstacle that may be poorly visible to birds, especially at night or during adverse weather conditions, such as dense fog or sandstorms. This potential impact is considered to be of medium significance prior to mitigation. With the implementation of the proposed mitigation (which includes the installation of bird diverters), the impact is considered to be of **LOW significance**.

None of the twelve measurement sites nor the access routes leading to these sites impacted on any archaeological or historical sites. The proposed project layout is thus unlikely to have an impact on the archaeology of the area. This said, it is recommended that a Chance Finds Procedure be compiled and implemented on site.

The management and mitigation measures are included in more detail in the EMP (refer to Appendix 4 of the report). To ensure compliance with the EMP it is recommended that an Environmental Control Officer (ECO) is appointed during construction.

6 CONCLUDING STATEMENT

The work undertaken in support of this ECC Application has been completed in line with the applicable regulatory framework. The assessment process followed included the undertaking of three specialist assessments deemed necessary to adequately identify and assess these potential impacts.

Following the impact assessment process, the identified residual impacts are assessed to be of **LOW** significance with the implementation of the recommended mitigation measures. The potential impacts can be adequately mitigated with the implementation of the proposed mitigation measures (as included in the EMP), which follows the principle of the mitigation hierarchy by firstly avoiding identified sensitive areas, and then reducing / minimising the impact, and lastly rehabilitating disturbed sites.

Based on the findings of the EIA and associated specialist studies, SLR is of the opinion that this EIA Scoping Report and EMP is sufficiently robust and provides sufficient information for MME and MEFT to make an informed decision on the proposed project taking into consideration the significance of potential impacts. SLR recommends that the commitments presented in the EMP should be conditional to the ECC, should MEFT approve the application.

Table 1: Summary of the significance of the impacts associated with the proposed met mast and remote sensing project in the TKNP

Note: (1) Neg = Negligible; VL = Very Low; L = Low; M = Medium; H = High; VH = Very High; +ve = Positive.
(2) * indicates that no mitigation is possible and/or considered necessary, thus significance rating remains.
(3) ** indicates that although the significance rating of the impact remains the same, the intensity of the impact decreases due to the proposed mitigation.

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
1	CONSTRUCTION PHASE					
1.1	Establishment of new tracks and erection of met masts and LIDAR	Removal and disturbance of vegetation and soil	Loss of vegetation and associated biota	MEDIUM	- Avoid the creation of additional new tracks by ensuring the final agreed access routes are adhered to at all times. - Appoint an ECO to oversee construction activities in accordance with the EMP. - Minimise and demarcate construction footprint (with wooden stakes). - Position the mast and anchors and lay-down areas to avoid plant species of concern such as <i>Zygophyllum applanatum</i> near site S5 and <i>Polemanniopsis namibensis</i> in the vicinity of sites S1, S2, S3, and LIDAR1 and LIDAR1a. - Restore disturbed areas by, at minimum, 'brooming' disturbed surfaces to natural profile.	LOW
1.2			Loss of or disturbance to avifauna habitat	MEDIUM		LOW
1.3			Disturbance, damage or loss of archaeological or historical sites	NO IMPACT	- Avoid the creation of additional new tracks by ensuring the final agreed access routes are adhered to at all times. - Appoint an ECO to oversee construction activities in accordance with the EMP. - Minimise and demarcate construction footprint (with wooden stakes). - Implement Chance Finds Procedure.	NO IMPACT
1.4			Introduction of invasive alien plants associated with construction activities	LOW	- Spray (with water) all construction vehicles at a designated facility outside the park prior to first entry. - Conduct routine checks for alien invasive plants.	LOW **

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
					Remove any alien invasive plants found in areas disturbed by the Project and incinerate at a designated area outside the TKNP.	
1.5		Increased traffic volume and construction activities	Loss and disturbance of vegetation and terrestrial fauna	MEDIUM	- Adhere to final agreed access routes. - Minimise the upgrading and maintenance of access, as far as possible. - Minimise and demarcate construction footprint. - Appoint ECO to oversee construction activities in accordance with the EMP. - Adhere to TKNP regulations especially with respect to natural resource use; waste management; traffic; water use; traffic speeds; etc. - Avoid hills, inselbergs, ridges and other prominent features (e.g., Kaukausib spring) and treat as no-go areas. - Accommodate workforce off site. - Develop and implement an Environmental Code of Conduct for all construction staff and ensure staff are well informed of environmental controls through induction and regular toolbox talks. - Store construction equipment and waste that is susceptible to hyena damage appropriately (e.g., on vehicles or storage container) or implement some form of protection (e.g., ready fence panels).	LOW
1.6			Disturbance of avifauna	LOW		LOW **
1.7						
1.8		Generation of waste and hydrocarbon spills	Soil, water and general environmental contamination	LOW	- Adhere to waste management protocols. - Ensure there is a supply of absorbent material readily available at each site to absorb / breakdown spills.	LOW **

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
2	OPERATION PHASE					
2.1	Presence and operation of met masts and LIDAR	Alteration of site characteristics	Bird collision mortality, injury and changes in behaviour	MEDIUM	- If necessary, discuss any amendments to the final met mast locations with a terrestrial ecologist. - Equip all upper guy wires with bird flight diverters. - If acceptable to NCAA, lighting should consist, as far as possible, of red or green (rather than white), flashing (rather than steady burning) lights.	LOW
2.2			Injuries to traversing birds due to laser light pulses from LIDAR sensor	LOW	None.	LOW *
2.3		Increased traffic volume and presence of staff	Disturbance of vegetation and terrestrial fauna	LOW	- Adhere to final agreed access routes. - Adhere to TKNP regulations especially with respect to natural resource use; waste management; traffic; water use; traffic speeds; etc.	LOW **
2.4			Disturbance of avifauna	LOW	- Avoid hills, inselbergs, ridges and other prominent features (e.g., Kaukausib spring) and treat as no-go areas. - Accommodate workforce off site. - Conduct routine checks and remove alien invasive plants, and incinerate at a designated area outside the TKNP.	LOW **
2.5		Generation of waste and hydrocarbon spills	Soil, water and general environmental contamination	LOW	- Adhere to waste management protocols. - Ensure there is a supply of absorbent material readily available at each site to absorb / breakdown spills.	LOW **

No.	Activities	Aspects	Impacts on Main Receptors	Pre-Mitigation Significance	Key Mitigation / Project Controls	Residual Significance
3	DECOMMISSIONING PHASE					
3.1	Removal of infrastructure	Increased traffic volume and presence of staff	Disturbance of vegetation and terrestrial fauna	LOW	- Adhere to final agreed access routes. - Adhere to TKNP regulations especially with respect to natural resource use; waste management; traffic; water use; traffic speeds; etc. - Avoid hills, inselbergs, ridges and other prominent features (e.g., Kaukausib spring) and treat as no-go areas. - Accommodate workforce off site. - Removal of alien invasive plants.	LOW **
3.2			Disturbance of avifauna	LOW		LOW **
3.3		Generation of waste and hydrocarbon spills	Faunal injury / mortality due to construction waste and soil contamination	LOW	- Adhere to waste management protocols. - Ensure there is a supply of absorbent material readily available at each site to absorb / breakdown spills.	LOW **