2022

# ENVIRONMENTAL MANAGEMENT PLAN FOR THE OPERATION AND MAINTENANCE OF AN EXISTING 66KV OKAPYA– OSHAKATI TRANSMISSION LINE AND OSHAKATI SUBSTATION IN OSHANA REGIONS

**The document is prepared by NamPower's SHEW Section. June 2022**

NamPower

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# 1 LIST OF TERMS, ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| APD | Anti-Perching Devices |
| BFD | Bird Flight Diverters |
| EAP | Environmental Assessment Practitioner |
| ECC | Environmental Clearance Certificate |
| EIA | Environmental Impact Assessment |
| EMA | Environmental Management Act no 7 of 2007 |
| EMP | Environmental Management Plan] |
| GIS | Geographical Information System |
| HIV/AIDS | Human immunodeficiency virus/ acquired immunodeficiency syndrome |
| MEFT | Ministry of Environment, Forest and Tourism |
| NHC | National Heritage Council |
| SHE | Safety, Health and Environment |
| SHEW | Safety, Health, Environment and Wellness |
| kV | Kilovolt |

## 2 INTRODUCTION

In order to carry out its mandate of transmission and distribution of electricity, NamPower's has a transmission and distribution networks across all regions countrywide. The continuous operation of the 66kV Okapya – Oshakati transmission line, Oshakati substation and other infrastructures allow NamPower to provide uninterrupted supply of electricity to regions in order to improve the living conditions of Namibian citizens and to enable economic development.

The Okapya-Oshakati route runs westwards, from the Okapya Substation to the Oshakati Substation in Oshakati town.This transmission line is about 28.8 km in length and has a kamerad hare structure. The Oshakati substation covers a footprint of 1926 $m^2$.

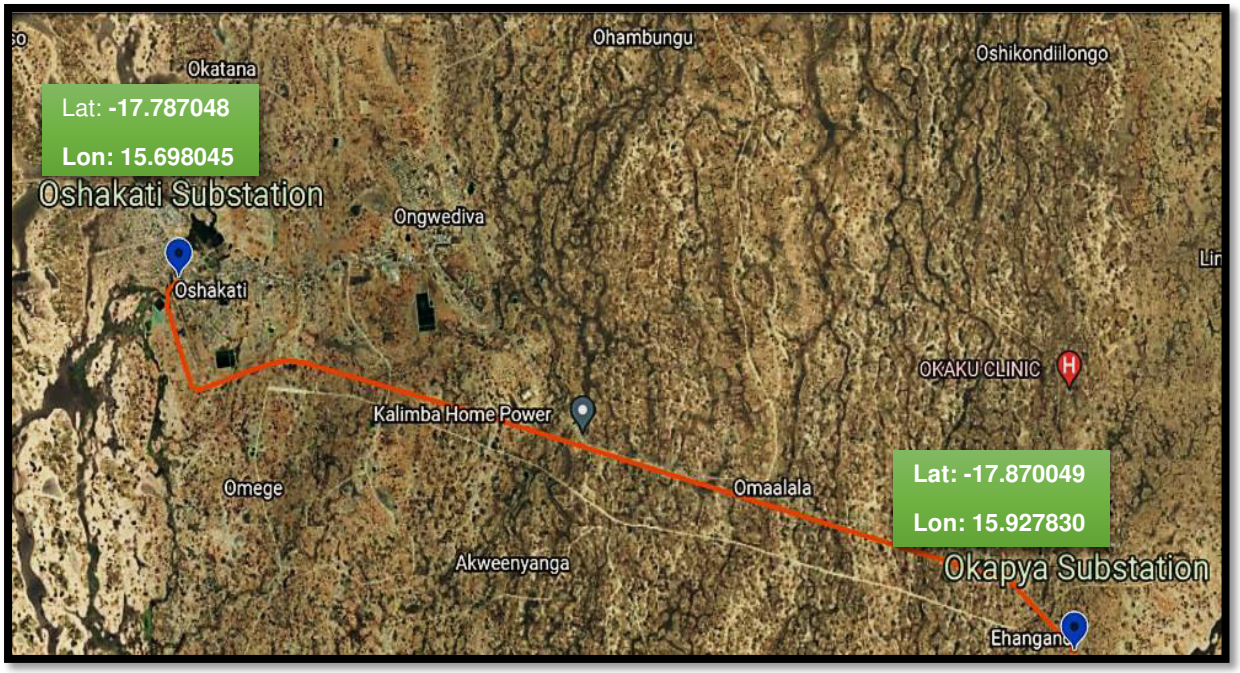


**Figure 1: Locality map showing the 66kV Okapya – Oshakati transmission line**

## 2.1 General area description

The Okapya – Oshakati 66kV passes through the vegetation type commonly referred to as Mopane Savannah or the two vegetation types referred to as the Cuvelai Drainage and Western Kalahari. The main rivers draining the general area flow westwards e.g. perennial Kunene River (Ruacana area) and southwards e.g. ephemeral Cuvelai drainage system (Cunningham, 2021). The general Okapya – Oshakati 66kV transmission line route, have numerous anthropogenic influences mainly associated with traditional farming practices (e.g. mahangu fields, kraals) rural/urban homesteads and businesses, tracks and roads, transmission lines and associated access routes and infrastructures (Cunningham, 2021).

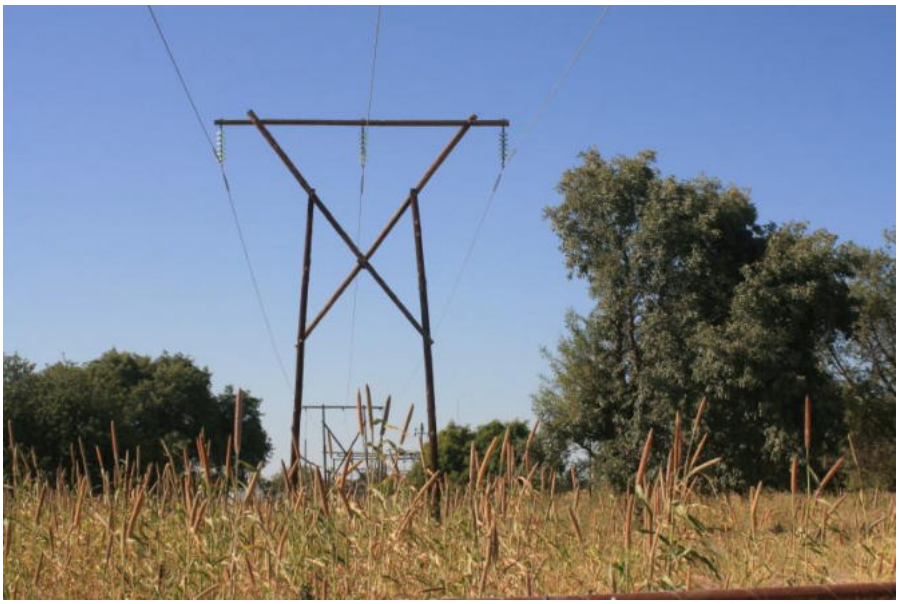

**Figure 3.** Numerous mahangu fields are located below the line

The route is not heavily vegetated with most of the route beneath the line converted to mahangu fields and or homesteads and other urban developments. The route passes through 8 “hotspot” area which is viewed as “high” sensitivity (See Annexure and Figures 5-6). In terms of sensitivity, 4.7% of the route is viewed as “high” sensitivity i.e. unique habitats and 95.3% of the route is viewed as “low” sensitivity.

**Figure 5.** Pans or locally known as oshanas are viewed as the most important habitats along the route.

**Figure 6.** Ephemeral pans along the route are viewed as “high” sensitivity.

## 3 OBJECTIVES AND SCOPE OF THIS ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The operation of the transmissions line and station can have a negative impact on the receiving environment. However, the impacts are limited to the station boundaries and line servitude. It is thus important that good management measures are implemented to ensure

that environmental damage is minimised. This Environmental Management Plan (EMP) seeks to manage and keep to a minimum the negative impacts associated with the transmission line and station and at the same time, enhance the positive and beneficial impacts.

The scope of this EMP include all activities associated with the operation of the transmission line, substations and other infrastructures. It is necessary to highlight that the EMP is a living document that should be periodically reviewed and updated. It must also be noted that the EMP should be read in conjunction with laws and regulations outlined in section 5, Table 1 and all other applicable laws.

The aim of this EMP is to detail the management actions required to implement the mitigation measures identified thereby ensuring that any operational phase activity is carried out in a manner that takes cognisance of environmental protection and is in line with National legislation.

This EMP has the following objectives:

- To outline mitigation measures to be implemented during the operation phase, in order to manage and minimise the extent of environmental impacts.
- Minimise negative impacts and enhance positive impacts associated with the operations.
- To ensure that the operational activities do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced.
- To identify key personnel who will be responsible for the implementation of the measures, outline functions and responsibilities.
- To propose mechanisms for monitoring compliance and preventing long term or permanent environmental degradation.
- Create management structures that address the concerns and complaints of Interested and Affected Parties (I&APs) with regards to the operational activities.

# 4 POLICY AND LEGISLATIVE FRAMEWORK

**Table 1 below outline the legislative requirements which are applicable to the operational and maintenance activities.**

| Legislation: | Section (s) applicable: | Implications: |
|---|---|---|
| Environmental Management Act no 7 of 2007 | Section 3<br><br>Section 27<br><br>Section 33 onwards<br><br>And all other applicable sections. | • All activities performed should be in line with the following principles:<br>o Interested and affected parties should have an opportunity to participate in decision making<br>o Listed activities should be subject to an EIA<br>o Polluter should pay for rehabilitation<br>o Pollution should be minimized<br>• Environmental assessments should be carried out for listed activities. The proposed activity can be classified under the following range of activities:<br>o Generation of electricity<br>o Transmission of electricity<br>• These sections details the process to be followed in order to obtain a clearance certificate.<br>• All existing listed activities must obtain a clearance certificate within one year of the law coming into effect. Therefore, all existing activities which can be considered a listed activity should apply for clearance. |
| EMA Regulations GN 28-30 (GG 4878) (February 2012) | • Listed activity:<br>• 5.1<br>• 6 – 9; 13; 15; 21 -24<br>• Any other applicable | • This activity can be considered as electricity generation and transmission.<br>• These sections details the process to be followed in terms of producing an Environmental |

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| | sections | Assessment and this process should be adhered to during the generation of information for this document. |
| No. 156 Labour Act, 1992: Regulations relating to the health and safety of employees at work . | All applicable regulations | All regulations applicable to different activities must be complied to. |
| Labour Act no 11 of 2007 | • Section 3<br>• Section 4<br>• Section 9<br>• Section 39 – 42<br>• All other applicable sections | • Children under the age of 16 may not be employed<br>• Forced labour may not be used.<br>• Basic conditions of employment as stipulated by the law must be met.<br>• The employer shall ensure the health and safety of all employees and non-employees on site. Employees must fulfil their duties in order to ensure their own health and safety and that of other employees and persons. Employees may leave the work site if reasonable measures to protect their health are not taken. |
| Electricity Act no 4 of 2007 | • Section 33 | • Installations used for the provision of electricity should be operated with due compliance with the requirements of laws relating to health, safety and environmental standards. Therefore – any company involved within the Electricity Supply Industry must adhere to the laws covering the previously stated aspects or stand to lose their licenses to operate. |
| Water Act no 54 of 1956 | • Section 21 and 66<br>• Section 23<br>• All other sections | • Conditions in terms of the disposal and management of effluent are to be adhered to. |

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| | applicable to different activities. | • Any person causing pollution to a water source shall be guilty of an offence. |
| Public and Environmental Health Act no 1 of 2015 | • Section 52<br>• Section 53<br>• All other sections applicable to different activities. | • A person generating waste must ensure that the waste generated is kept and stored under conditions that causes no harm to human health or damage to the environment.<br>• Waste must only be disposed of at a waste disposal site, including an incinerator approved by the local authority concerned. |
| Water Resources Management Act no 24 of 2013 | • Section 89<br>• All other sections applicable to different activities. | • The owner or occupier or other person in control of land where an incident that causes or is likely to cause a water resource to be polluted must take all reasonable measures to contain and minimize the effects of the incident; and to clean up polluted areas and remedy the effects of the incident. |
| Hazardous Substances Ordinance 14 of 1974 | • Section 27<br>• All other sections applicable to different activities. | • To provide for the control of substances which may cause injury or ill-health to or death of human beings, by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances;<br>• To provide for the division of such substances into groups in relation to the degree of danger; |

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| | | • To provide for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances; and<br>• To provide for matters connected therewith. |
| Fertilizers, farm feeds, agricultural remedies and stock remedies Act no 36 of 1947 | • Definitions<br>• Section 7<br>• Section 10<br>• All other sections applicable to different activities. | • Arborocide application is defined as an agricultural remedy under this Act<br>• Only registered pesticide may be used.<br>• May only buy herbicides in a container that complies with the prescribed requirements and is sealed and labelled.<br>• Only allowed to use herbicides in the prescribed manner.<br>• Land owners must be notified about applications, and the following information must be supplied:<br>o Purpose of administration<br>o Registered name and number of the product<br>• Precautions to be taken before, during and after each administration. |
| The Nature Conservation Ordinance (1975) as amended through the Nature Conservation Amendment Act of 1996. | • Chapter 11: Game Parks, Nature Reserves, Conservancies and Wildlife Councils | • Permits are required to enter the National Park. Permits are also required for the removal of any protected plant or tree. It also stipulates that no damage may be done to any object of geological, |

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| | | ethnological, archaeological, historical or other scientific interest without the appropriate permits. |
| National Heritage Act No 27 of 2004 | • Section: 46, 48, 55<br>• All other sections applicable to different activities. | • All heritage resources are to be identified and either protected or removed/mitigated with a permit from the National Monuments Council, before any development may take place<br>• A chance find procedure should be followed in case of discovery of a heritage resource. |
| Soil Conservation Act no 76 of 1969 | • Section 4<br>• Section 13<br>• Section 21<br>• And other applicable sections | • Institutions may be ordered by the relevant Minister to construct soil conservation works when and where necessary.<br>• Fire protection schemes may be implemented to regulate the prohibition of veld burning as well as the prevention, control and extinguishing of veld and forest fires.<br>• It is illegal to damage, destroy / fail to maintain any soil conservation works; fire belts; works constructed in terms of a fire protection scheme. |
| Forest Act no 12 of 2001 | • Section 66<br>• Section 41<br>• And other applicable sections | • Vegetation may not be removed within 100 m of a river, stream or water course<br>• A person shall be liable for damage caused by any fire which arises as a result of activities carried out on site without having taken reasonable measures to prevent a fire. |

## 5 ROLES AND RESPONSIBILITIES

It is the responsibility of NamPower and/or contractor to ensure that all the environmental management actions are carried out effectively and timeously. It is important to note that the successful implementation of the EMP is, however dependent on clearly defined roles and responsibilities by several stakeholders. Below are the key employees that are responsible for the management of environmental and social issues during the operational phase:

**Table 2: The roles and responsibilities for operational and maintenance activities:**

| Responsible person | Responsibilities |
|---|---|
| **The Area Superintendent** | • Is responsible for the enforcement of the EMP<br>• To ensure that environmental requirements are adequately covered in any external service provider contracts.<br>• To ensure that SHE requirements are included in the tender documents sent to the contractors. A copy of this EMP should also form part of the tender documents.<br>• To ensure that corrective actions are implemented for non-compliances.<br>• To ensure that appropriate records and information regarding compliance with environmental requirements are maintained.<br>• To ensure that the stations and lines remain in compliance with the requirements of this EMP, through regular communication and monitoring.<br>• To ensure that all incidents, accidents and complaints are reported to the project manager. The contractor to ensure that incidents and accidents are investigated to prevent re-occurrence. |
| **Project Manager** | • Is responsible for the enforcement of the EMP.<br>• To ensure that SHE requirements are included in the tender documents sent to the contractors.<br>• Must ensure that the contractor remains in compliance with the |

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| | requirements of this EMP. |
| **NamPower SHEW** | • To ensure that all requirements with regards to this EMP are fulfilled.<br>• To assist the Project Manager in ensuring that the contractor remains in compliance with this EMP.<br>• Communicate NamPower SHEW requirement to the contractors and NamPower employees.<br>• Request NamPower sections and contractors to submit SHEW files prior to any activity taking place for approval.<br>• Provides SHEW inductions to NamPower and contractor employees.<br>• Implement monitoring and conduct audits in consultation with the Project Manager.<br>• Document and communicate monitoring, audit and inspection findings to project manager and area superintendent.<br>• Communicate the final inspection report to the Project manager on contractor compliance to the EMP before the project close-off and final payment is made to the contractor. |
| **Contractor** | • Is responsible for the implementation of the EMP<br>• To appoint as SHE officer responsible for the implementation of this EMP.<br>• To ensure that all tasks undertaken under the scope of work, are in accordance both with NamPower's SHEW policies and procedures as well as to the requirements of this EMP.<br>• Ensure that employees are regularly trained and awareness built relating to environmental and social management.<br>• To ensure that all incidents, accidents and complaints are reported to the project manager. The contractor to ensure that incidents and accidents are investigated to prevent re- |

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| | occurrence.<br>• Ensuring that all employees receive a SHEW induction before the start of the project.<br>• Ensuring that the work being done does not create a nuisance to any being working, residing or living on adjacent properties or within the immediate surroundings of the site. |

## 6 DESCRIPTION OF OPERATIONAL ACTIVITIES TO BE UNDERTAKEN AND ASSOCIATED IMPACTS

The table below outlines the summary of the operational activities and associated socio-economic and environmental impacts.

**Table 3: Description of the activities related to the operational activities.**

| Activity | Description | Associated potential impacts |
|---|---|---|
| **General functioning of the station and transmission line.** | • Physical presence and functional characteristics of the station and associated line. | • Animal (including birds) mortalities through collisions and electrocution.<br>• Destruction of avifauna, especially protected spp.<br>• Visual impact.<br>• Community impacts in a form fatalities or injuries caused by electrocution.<br>• Meeting electricity demand (positive impact). |
| **Maintenance of the station and line** | • The maintenance of the station and line entails:<br>• General equipment repairs. | • Soil and water contamination<br>• Waste generation leading to filling up of landfill space<br>• Destruction of vegetation; |

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| | • Replacement and servicing of batteries.<br>• Maintenance of electrical equipment such as transformers, relays and capacitors.<br>• Maintenance of electrical equipment such as transformers, relays and capacitors.<br>• Construction or repairing of access roads. | vertebrate fauna; avifauna especially protected spp. and sensitive habitats.<br>• Social issues related to the introduction of new workers in the area, e.g. HIV/AIDS spreading.<br>• Loss of human life (through electrocution).<br>. |
| **Construction** | • Construction include the following activities:<br>• Construction or refurbishment of buildings (digging and setting of foundations, digging of cable trenches and other activities) .<br>• Installation or extension of boundary fences<br>• Upgrade of electrical equipment (either in size, capacity or technology).<br>• Personnel conduct in surrounding communities. | • Noise emissions<br>• Dust emissions<br>• Introduction of new people in the area leading to the spread of diseases such as HIV/AIDS<br>• Soil and water contamination<br>• Waste generation leading to filling up of landfill space<br>• Employment of casual workers<br>• Loss of biodiversity reduces habitat availability and food sources for many animals.<br>• Loss of sensitive plants and habitats.<br>• Loss or damage of heritage resources. |
| **Periodic inspections** | • Replacement, cleaning | • Soil and ground water |

| | | |
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| **and monitoring** | and maintenance of station and line components. | contamination as a result of oil spills<br>• Soil contamination as a result of improper waste handling and disposal.<br>• Loss of biodiversity if existing access roads are not put to use. |
| **Use and storage of Hazardous Substances** | • Storage of hazardous material. | • Possible oil spills and soil contamination from electrical units such as transformers. |
| **Installation of Optic Fibre networks** | • Design, Supply, Delivery, Installation and Commissioning of Optic Fiber networks for communication purposes. | • Loss of biodiversity<br>• Soil contamination as a result of improper waste handling and disposal.<br>• Loss of sensitive plants and habitats. |
| **Vegetation Management** | • Removal of trees and bushes to maintain access to the line servitude. Removing weed from the substation yard. | • Destruction of vegetation; vertebrate fauna; avifauna especially protected spp. and sensitive habitats.<br>• Conflict with landowners<br>• Loss of topsoil<br>• Soil and water contamination<br>• Loss or damage of heritage resources.<br>• Soil erosion<br>• Destruction of sensitive habitats |

# 7 MANAGEMENT AND MITIGATION MEASURES

In order to ensure that the potential impacts are eliminated and/or minimised, it is necessary to ensure that the various activities related to the operation and maintenance of the powerlines and station are adequately managed and monitored. Table 4 below outline mitigation measures as well as objectives to be achieved. A responsible person (s) have been assigned to each mitigation measure (s).

**Table 4: Proposed mitigation measures for the general operational activities**

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| **Safety Health and Environmental (SHE) Awareness** | • All employees should undergo SHE induction before work commences onsite.<br>• All employees are to be made aware of their individual roles and responsibilities in achieving compliance with the EMP.<br>• SHE toolbox talks to be conducted by the contractors and records to kept onsite.<br>• Warning signs must be placed on and around the site. | • Area superintendent<br>• Project manager<br>• Contractor |
| **Safety Management** | • Develop and implement an occupational health and safety system that comprises key elements such as risk assessment and safe working procedure.<br>• All work activities to be done under the supervision of a competent person.<br>• Appropriate warning signs must be placed on the facilities. | • Area superintendent<br>• Project manager<br>• Contractor |
| **Fire Management** | • Eliminate the presence of potential sources of ignition and provide appropriate equipment to minimize fire risk.<br>• Fire extinguishers to be readily available onsite, especially when hot works are conducted. | • Area superintendent<br>• Project manager<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | • Regular servicing of fire extinguishers.<br>• Fire breaks must be implemented. | |
| **Air Quality** | • Dust generation from all activities must be minimised.<br>• Excavation, handling and transportation of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present.<br>• Speed limit to be enforced to control dust emissions.<br>• Dust suppression measures shall be implemented when necessary.<br>• Vehicle, machinery and equipment shall be maintained in good working order in order to minimise exhaust fume emissions.<br>• Vehicle, machinery and equipment must be serviced by competent personnel and records must be kept onsite | • Area superintendent<br>• Project manager<br>• Contractor |
| **Resources Efficiency** | • Minimise water wastage and record water usage.<br>• Avoid wasteful use of materials.<br>• Source goods and services locally were possible | • Area superintendent<br>• Project manager<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| **Waste Management** | • Minimise the generation of waste by applying the waste hierarchy.<br>• Station and line servitude to be kept free of waste.<br>• No burning, burying or dumping of any waste materials shall be permitted onsite.<br>• Labelled waste bins with lids must be provided at substations/campsites for all waste streams and ensure that waste is disposed at nearest approved waste disposal site.<br>• Ensure that waste segregation is done at source.<br>• Hazardous waste shall be disposed of at a registered hazardous waste disposal site.<br>• Safe disposal certificates for hazardous waste must be kept in the SHE file.<br>• Concrete waste must not be dumped on site. | • Area superintendent<br>• Project manager<br>• Contractor |
| **Wastewater management** | • Water containing environmental pollutants shall be collected and removed from site.<br>• No waste water runoff or uncontrolled discharges from the site/working areas shall be permitted. | • Project manager<br>• Contractor<br>• Area superintendent |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | • Mobile toilets or septic tanks should be used in remote areas. | |
| **Hazardous Substances** | • The use, handling, storage and disposal of the hazardous chemical must be in accordance with the MSDS.<br>• Containers must be clearly marked to indicate contents and quantities.<br>• Hazardous substances storage areas must be bunded. A bund should be able to contain 110% of the volume of the largest container stored within it.<br>• All transformers to be contained in bunded areas.<br>• Diesel and other liquid fuel, oil and hydraulic fluid must be stored in appropriate storage tanks or in bowsers with secondary containment.<br>• Inspect and maintain hazardous storage areas and bund walls to avoid overflows.<br>• Ensure that drip trays are available for vehicles when conducting maintenance activities in case of transmission fluid spills.<br>• Spill kit and absorbents must be available onsite at substations.<br>• Hazardous substance storage areas must display safety symbolic signs.<br>• All spills must be reported, cleaned and remediated to in compliance with | • Area superintendent<br>• Project manager<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | SHEW requirements. | |
| **Social Impact** | • NamPower/ Contractor must sign land permission form and agreement with land owners prior to commencement of work onsite.<br>• Employees should limit their contact with permanent residents of the area.<br>• Employees should be properly educated about the impact of HIV / AIDS and pregnancies.<br>• The use of intoxicating liquor or drugs of any kind by the employees is strictly prohibited.<br>• Ensure that all queries and complaints are documented and dealt with.<br>• A register shall be kept of all complaints from stakeholders.<br>• All claims shall be handled immediately to ensure timely rectification. | • Area Superintendent<br>• Project Manager<br>• All NamPower employees<br>• Contractor |
| **Archaeology** | • Should a heritage site or archaeological site be uncovered or discovered during the operation phase, a “change find” procedure in appendix 8 should be applied.<br>• Any chance finds must be reported to NamPower environmental section.<br>• In an event of discovery of human remains or other artefacts the work shall | • Area superintendent<br>• Project Manager<br>• SHEW<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
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| | cease. A professional archaeologist is to be consulted and carry out investigation. | |
| **Fauna and Flora** | • Ensure that the site is kept clean and free of rubbish that could potentially attract animals and pests<br>• No harvesting of plants is allowed.<br>• Poaching or capturing of any animal (wild or domestic) is prohibited.<br>• Bird nests may not be disturbed unless interfering with the normal operation of the line/station.<br>• No domestic animals may be kept onsite site as they can introduce diseases or interbreed with the animals occurring naturally in the area.<br>• Vehicles driving along the lines should engage four wheel drive to prevent spinning and consequent impacts on soil surface.<br>• Do not destroy, damage, collect any protected flora species that may be encountered during maintenance clearing of servitude operations;<br>• Minimise activity in/around pan habitats.<br>• Only remove/prune flora directly affecting the transmission line; | • Area superintendent<br>• Project Manager<br>• SHEW<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | • No chemical and mechanical clearing in pan habitats – rather manual clearing in these areas;<br>• Mechanical clearing, without chemical aftercare, in non-pan areas (area is heavily populated with numerous mahangu fields);<br>• Existing tracks must be utilised.<br>• Do not drive through and/or damage pan (oshanas) systems<br>• Install electrostatic animal and/or squirrel guards on the bushings at substations and on-pole-mounted switching gear to prevent some mammals – e.g. small-spotted genet, mongoose (only if problems experienced).<br>• Identify potential bird collision prone areas (i.e. habitats).<br>• Identify potential transmission line sensitive bird species.<br>• Add bird flight diverters (BFD's) and anti-perching devices (APD's) to the transmission line at/along collision prone habitats.<br>• Monitor all bird mortalities encountered under the transmission line.<br>• All wildlife and electrical infrastructure interactions must be reported to the SHEW section. | |
| **Water Resources** | • Care must be taken to ensure that pollution of water does not occur. | • Area superintendent |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | • Naturally occurring water resources may not be used for any personal hygiene.<br>• Water may only be taken from a private or government property based on an agreement between the NamPower, contractor and custodian of the water source. | • Project Manager<br>• SHEW<br>• Contractor |
| **Campsite Establishment** | • NamPower/ Contractor must sign land permission form and agreement with land owners prior to commencement of work onsite.<br>• Adequate ablution facilities must be provided onsite in relation to the number of employees.<br>• Ablution facilities must not be located within 100m of any river, stream channel, pan, dam or borehole<br>• Non-employees are not allowed to reside at the campsite.<br>• Fire extinguishers, first aid kits, assembly point, and emergency numbers must be available onsite.<br>• Waste must be managed in accordance with waste management requirements outlined in this EMP. | • Area superintendent<br>• Project Manager<br>• SHEW<br>• Contractor |
| **Manual and Mechanical Vegetation Removal** | • Obtain a permit from the Ministry of Environment, Forestry and Tourism to remove protected trees as per the Forest Act No. 12 of 2001. | • Area superintendent<br>• Project Manager |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | • Measures must be put in place to avoid erosion at rivers, stream channel crossings, and at places where existing erosion scars and dongas are encountered to avoid any further erosion.<br>• Where manual bush-clearing is impractical, mechanical bush clearing shall be used, but an effort must be made to preserve the topsoil structure.<br>• The disturbed soil must be levelled.<br>• Do not remove wood cut on site as this would affect the recycling of nutrients locally as well as lead to a potential industry in firewood targeting the better quality tree species.<br>• Where clearing is done near a river, the contractor/NamPower must ensure that no felled bushes/branches/shrubs are left behind in the riverbed.<br>• No burning of bush cleared materials is allowed onsite.<br>• Protected tree species, especially larger specimens, within the affected area i.e. 12m from centre line in either direction not expected to affect the transmission line could be avoided.<br>• Manual and mechanical vegetation removal should be done in accordance with NamPower vegetation clearance and maintenance Procedure.<br>• Avoid the cutting down of protected tree species [Forestry Ordinance No. 37 | • SHEW<br>• Contractor |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| | of 1952) not directly affecting the power lines during the line clearing operation. | |
| **Herbicide Use** | • Prevent the application of selected herbicide(s) in sensitive areas – e.g. "high" & "medium" sensitivity areas (See annexure 1). Sensitive areas are known/expected to have higher biodiversity.<br>• Avoid the spraying of protected tree [Forestry Ordinance No. 37 of 1952) not directly affecting the power lines during the line clearing operation.<br>• Eradicate all invasive alien species potentially associated with the line/station. This would indicate overall environmental commitment.<br>• Avoid spraying herbicide during windy days/periods. See the general product requirements for herbicide used. This could affect non-target areas and species.<br>• Avoid spraying, removing and/or approaching trees with vulture (and other larger raptors) nests along the route.<br>• Implement strict control over the storage, protective measures & application of the selected herbicide(s) throughout.<br>• Herbicide should be applied directly to the plant's stem or leaves as a spray.<br>• Herbicide will be handled in accordance with the requirements outlined in the NamPower Vegetation Clearance and Maintenance procedure. | • Area superintendent<br>• Project Manager<br>• SHEW<br>• Contractor |
| **Site Rehabilitation (progressive and post** | • Progressive rehabilitation when construction work is in progress. Post construction rehabilitation must also be done. All materials, equipment and | • Area superintendent |

| ASPECT | MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS | RESPONSIBLE PERSON |
|---|---|---|
| **rehabilitation)** | waste must be removed from site.<br>• A post construction audit within 1 week prior to the Contractor leaving site must be conducted.<br>• SHEW to sign site close off or take over certificate once remedial corrective actions have been implemented. | • Project Manager<br>• SHEW<br>• Contractor |

## 8 REPORTING, MONONITORING AND AUDITING

The environmental monitoring and audits must be conducted in line with supporting procedures and requirements of this plan. Monitoring and audit reports detailing the monitoring and audit results shall be prepared by the SHEW section and communicated to the Area Manager, Superintendent and Project Manager. Records of monitoring and auditing report shall be kept and will be made available during inspection and audits.

The following general monitoring indicators and guideline are recommended should herbicides be used to do vegetation management along the line:

**Table 5: General monitoring indicators and guideline recommended after herbicide application**

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|---|---|
| Monitor trees adjacent the cleared area after herbicide application | A survey in year 1 (i.e. 6 months after application of herbicide) should be conducted along the affected route to determine the effect of the herbicide on non-target areas – i.e. adjacent vegetation. Focus on protected tree species along the route |
| Monitor coppicing and regrowth after herbicide application | A survey in year 2 (i.e. 1 year after application of herbicide) should be conducted along the affected route to determine the effect of the herbicide on bush clearing.<br><br>This would indicate the success of the herbicide used as well as indicate the necessity of follow-up treatment. |
| Sample any open surface water after herbicide application | Very few open water sources are located along the route and although it is recommended that herbicides not be used in “high” and “medium” sensitivity areas, monitoring this would be viewed as a good practice.<br><br>Take water samples from any surface water encountered and have these analysed to determine if herbicide used has entered these sources. |

## 9 NON-COMPLIANCE AND CONFLICT MANAGEMENT PROCEDURES

The Area Superintendent and Contractor shall ensure that the employees and external service providers comply with the requirements outlined in this EMP. In the event of non-compliance the following recommended process shall be followed:

- Non – compliances will be identified during inspections or audits carried out by the SHEW Section and reported to the Area manager, Superintendent and Project Manager for corrective actions.
- Area Superintendent / Project Manager shall notify the responsible stakeholders about the non-compliance .
- Corrective and preventative actions must be implemented on an agreed timeframes.
- Follow – up inspections/audits shall be conducted to assess whether the corrective and preventative actions were implemented effectively.

The contractor shall notify NamPower of the following:

- Conflicts arising with any landowner / representative.
- Any special conditions requested by a landowner / representative.

NamPower has the right to stop all contractor's activities if it is found that a gross violation of the EMP is taking place.

## 10 RECORD KEEPING

Record keeping is important for the effective functioning and implementation of an EMP. EMP documentation must be kept in both the hard copy and electronic format for safe keeping. These must include:

- Copy of the Environmental Clearance Certificate
- A copy of an EMP
- EMP implementation activities
- Induction records
- Resource use records i.e. water and fuel consumption
- Audit and Inspection reports

In case chemical vegetation management is conducted, the following records should be kept:

- Date of application
- Herbicide applied

- Persons responsible for application
- Supervisor
- Type of herbicide used
- Method of application
- Time of application
- Equipment used
- Concentration of herbicide used

## 11 CONCLUSION

All management measures and legal requirements outlined in this EMP should be implemented in order to ensure environmental compliance by all parties undertaking the operational activities. This will ensure that potential negative impacts are identified, avoided or mitigated and positive impacts are enhanced.

## 12 ANNEXURES

### Annexure 1: . Areas of importance, with protected species potentially affected, along the Okapya-Oshakati 66kV transmission line.

**[Direction: Okapya Substation westwards towards the Oshakati Substation area].** NB: the kilometres reflected on the table below may differ with the actual kilometres covered by the line since the route taken during the survey diverted from the actual route due to obstacles encountered like mahangu fields.

| Hotspot areas | Distance (km) | Area | Important species | Common names | Status | Aliens | Other important features | Importance ranking |
|---|---|---|---|---|---|---|---|---|
| | 0 to 3.0 | Okapya SS | *Hyphaene petersiana* | Makalani | F, LC | *Prosopis* spp. | | Low |
| 1 | 3.0 to 3.2 | Okapya SS | *Diospyros mespiliformis*<br>*Hyphaene petersiana* | Jackal berry<br>Makalani | F, LC<br>F, LC | | Pan | High |
| | 3.2 to 7.2 | Okapya SS | | | | | | Low |
| 2 | 7.2 to 7.3 | Okapya SS | | | | | Pan | High |
| | 7.3 to 9.6 | Okapya SS | | | | | | Low |
| 3 | 9.6 to 9.7 | Okapya SS | *Diospyros mespiliformis* | Jackal berry | F, LC | | Pan | High |
| | 9.7 to 19.7 | Okapya SS | | | | | | Low |
| 4 | 19.7 to 19.8 | Okapya SS | *Diospyros mespiliformis*<br>*Hyphaene petersiana* | Jackal berry<br>Makalani | F, LC<br>F, LC | | Pan | High |
| | 19.8 to 20.4 | Oshakati SS | | | | | | Low |
| 5 | 20.4 to 20.6 | Oshakati SS | *Hyphaene petersiana* | Makalani | F, LC | | Pan | High |
| | 20.6 to 27.4 | Oshakati SS | | | | | | Low |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | 27.4 to 27.6 | Oshakati SS | *Combretum imberbe* | Leadwood | F, LC | | Pan | High |
| | 27.6 to 36.2 | Oshakati SS | *Aloe esculenta* | | NC | | | Low |
| 7 | 36.2 to 36.4 | Oshakati SS | *Diospyros mespiliformis*<br>*Hyphaene petersiana* | Jackal berry<br>Makalani | F, LC<br>F, LC | | Pan | High |
| | 36.4 to 43.0 | Oshakati SS | | | | | | Low |
| 8 | 43.0 to 44.0 | Oshakati SS | | | | *Cryptostegia grandiflora*<br>*Opuntia* spp. | Pan | High |
| | 44.0to 44.7 | Oshakati SS | | | | | | Low |

## Annexure 2: Herbicide application guideline

| **Management requirement** |
|---|
| *Recommended herbicide:* Access 240 SL or any similar product with picloram or tricoplyr as active ingredients should be used |
| *Recommended Application method:* Foliar application – spray or paint-on-stump –is recommended as this is target specific. Access mixed with water and Actipron (wetting agent). |
| *Technique:* The herbicide can be applied directly to the plant – stem or leaves – as a spray. Trees and shrubs with a stem diameter <10cm can be sprayed directly, but trees with a stem diameter >10cm should be felled before treatment of the cut surface for best results. Treatment should be done as soon as possible after felling and the entire cut surface and stump should be wetted. Coppice growth can also effectively be controlled. |
| *Use:* Active growing season – i.e. September to April (best in early growing season – September to November – before main rains) has best results. |
| *Concentration*<br><br>Foliar application = 350ml/100l water + Actipron Super 500ml/100l spray mix.<br><br>Cut stump application = 2l/100l water + Actipron Super 2l/100l spray mix. |
| *Application repeatability*<br><br>▪ Year 1: Apply herbicide (early growing season)<br>▪ Year 2: Follow-up to target any regrowth and coppicing (early growing season)<br>▪ Thereafter: As required – i.e. dependent on coppicing potential of various species. This could be determined during routine line inspections. |

## Annexure 3: Monitoring checklist for bush clearing and herbicide application

| **Activity: Bush clearing**<br><br>**Site:** | **Compliance** | |
|---|---|---|
| | Yes | No |
| Manual clearing conducted | | |
| Mechanical clearing conducted | | |
| Area adequately cleared – i.e. 12m from centre line | | |
| Protected tree species on 12m boundary only trimmed | | |
| Protected tree species not affecting line left *in situ* | | |
| Raptor and vulture nesting sites left undisturbed | | |
| Overall access improved | | |
| Activity: Chemical application | | |
| Active ingredient used = Triclopyr | | |
| Application method used = spray | | |
| Application technique used = spray leaves/cut stumps | | |
| Application season = Sep to April (Sep to Nov = best) | | |
| Application conditions = no wind | | |
| Application procedures = protective masks/equipment used | | |
| Application knowledge = certified users only | | |
| Storage = safe/secure | | |
| Storage = chemical register maintained | | |
| Storage = equipment clean/functional | | |
| Concentration: Foliar application = 350ml/100l water + Actipron Super 500ml/100l spray mix | | |
| Concentration: Cut stump application = 2l/100l water + Actipron Super 2l/100l spray mix | | |
| Repeatability: Year 1 | | |
| Repeatability: Year 2 | | |
| Repeatability: Year 3 | | |
| Sensitive “hotspot” areas avoided | | |
| Water – open surface water encountered | | |
| Water – open surface water samples taken | | |
| Collateral damage observed (i.e. non target areas/species affected) | | |
| Any complaints from landowners | | |

## Annexure 4: Protection of Ecology & Vegetation – Okapya-Oshakati

| **Activity: Protection of Ecology & Vegetation – Okapya-Oshakati** | **Compliance** | |
|---|---|---|
| | **Yes** | **No** |
| Track discipline | | |
| Evidence of new tracks | | |
| Evidence of offroad driving | | |
| Evidence of turnaround violations | | |
| Evidence of oil spills | | |
| Evidence of waste | | |
| Evidence of litter | | |
| Illegal collection/damage of flora | | |
| Evidence of illegal plant collection | | |
| Evidence of vehicle damage to plants | | |
| Evidence of unauthorised people/vehicles | | |
| Erosion | | |
| Evidence of erosion along route | | |
| Evidence of recovery at rehabilitated sites | | |
| Invasive alien plants | | |
| Evidence of invasive alien plants along route - New | | |
| Evidence of invasive alien plants along route - Existing | | |
| Evidence of invasive alien plants at rehabilitated sites | | |
| New species | | |
| Any new plants encountered – i.e. not previously observed | | |
| Domestic stock/pets | | |
| Domestic stock and/or pets encountered along route (Relevant to Protected Areas only) | | |
| Bird mortalities | | |
| Record all dead birds encountered below the line | | |

## Annexure 5: Landowner permission form

# Landowner Permission Form

| | |
|---|---|
| Landowner name: | Contact number: |
| Representative name: | |
| Farm name: | |
| Contractor: | |
| Representative name: | Contact number: |

**General Notice**

This form is to be used prior to a contractor entering a landowner's property to commence any work related to the construction or maintenance of power-line structures and servitudes.

The form must be completed by either the landowner or his / her legal representative on the property.

## Section A: Before activities commence

**Activities to be undertaken on the property (completed by the contractor):**

| | | | |
|---|---|---|---|
| Use of water resources | | Camping | |
| Powerline erection | | Bush clearing | |
| Powerline refurbishment | | Herbicide application | |
| Trimming of vegetation | | Access road usage | |
| Use of other infrastructure | | Rehabilitation | |
| (please specify) | | | |

**Specific conditions to be met on the property (as stipulated by the landowner):**

_____

_____

_____

_____

**Dates when access is needed:**

**From:** _____ **To:** _____

**Signatures (prior to entry)**

_____ _____

Landowner/Representative Contractor representative

_____ _____

Date Date

## Section B: Upon completion of work and prior to leaving the property

**Remarks on compliance or misconduct (upon completion of activities):**

**Issues still to be resolved upon completion of activities:**

**Signatures (upon completion)**

| | |
|---|---|
| Landowner/Representative | Contractor representative |
| Date | Date |

## Annexure 6: pre-application consent form for herbicide/pesticide application

| PRE-APPLICATION CONSENT FORM | |
|---|---|
| Name of Landowner / Representative: | |
| Contact Details: | |
| Name of Farm: | |
| Name of Contractor: | |
| Name and Details of Contact Person: | |
| Herbicide/pesticide to be used: | |
| Period of Application: | |
| NamPower District Supervisor: | |
| Contact Details: | |
| NamPower Installation to be Treated: | |
| Comments from Landowner/Representative: | |
| | |
| Signed: | |
| Landowner/ Representative: | NamPower Representative: |
| Date: | Date: |

## Annexure 7: Post application review form for herbicide/pesticide applications

| POST-APPLICATION REVIEW FORM | |
|---|---|
| Name of Landowner / Representative: | |
| Contact Details: | |
| Name of Farm: | |
| Name of Contractor: | |
| Name and Details of Contact Person: | |
| Herbicide/pesticide to be used: | |
| Period of Application: | |
| NamPower District Supervisor: | |
| Contact Details: | |
| NamPower Installation to be Treated: | |
| Outstanding Issues: | |
| | |
| | |
| Signed: | |
| Landowner/ Representative: | NamPower Representative: |
| Date: | Date: |

## Annexure 8: Chance find procedure

Definition: The “chance finds” procedure covers the actions to be taken from the discovery of a heritage site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The “chance finds” procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): “ a person who discovers any archaeological object must as soon as practicable report the discovery to the Council”. The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

**Procedure:**

Action by person identifying archaeological or heritage material

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

**Action by foreman**

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

**Action by archaeologist**

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed