OCTOBER 2021

Environmental Impact Assessment for the Proposed 400 kV Transmission Line from Omatando substation to Oshivelo Substation (Portion 2)

Site Specific Environmental Management Plan

NamPower

ENVIRO DYNAMICS

PROJECT NAME	Environmental Impact Assessment for the Proposed 400 kV Transmission Line from Omatando Substation to Oshivelo Substation (Portion 2)
STAGE OF REPORT	Specific Environmental Management Plan
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ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
GG	Government Gazette
GN	Government Notice
HIV	Human Immunodeficiency Virus
km	Kilometre
kV	Kilo Volt
NHC	National Heritage Council
SS	Substation
TB	Tuberculosis

APPENDICES

Appendix A	Vegetation Management Plan
Appendix B	Relocation and Compensation Plan

1 INTRODUCTION

The EIA was conducted for the 400kV Transmission Line and the EMP is updated to include Omatando and Oshivelo Substations as the two Substations are already existing and will be connected to the envisaged Transmission line.

The recently approved NamPower Transmission Master Plan has recognised the increasing demand for electricity in the northern regions of Namibia. In order to address this need and to strengthen the northern section of NamPower's transmission grid to ensure security of supply, NamPower intends to construct a new 400 kV transmission line from Kunene Substation (near Ruacana) to Oshivelo via Ongwediva. This 380 km proposed transmission line route has been divided into two portions, namely Portion 1 and Portion 2. Two separate Environmental Impact Assessment Reports (EIARs) have been produced for each. The measures recommended in this management plan are specific to Portion 2 (see **Figure 1**).

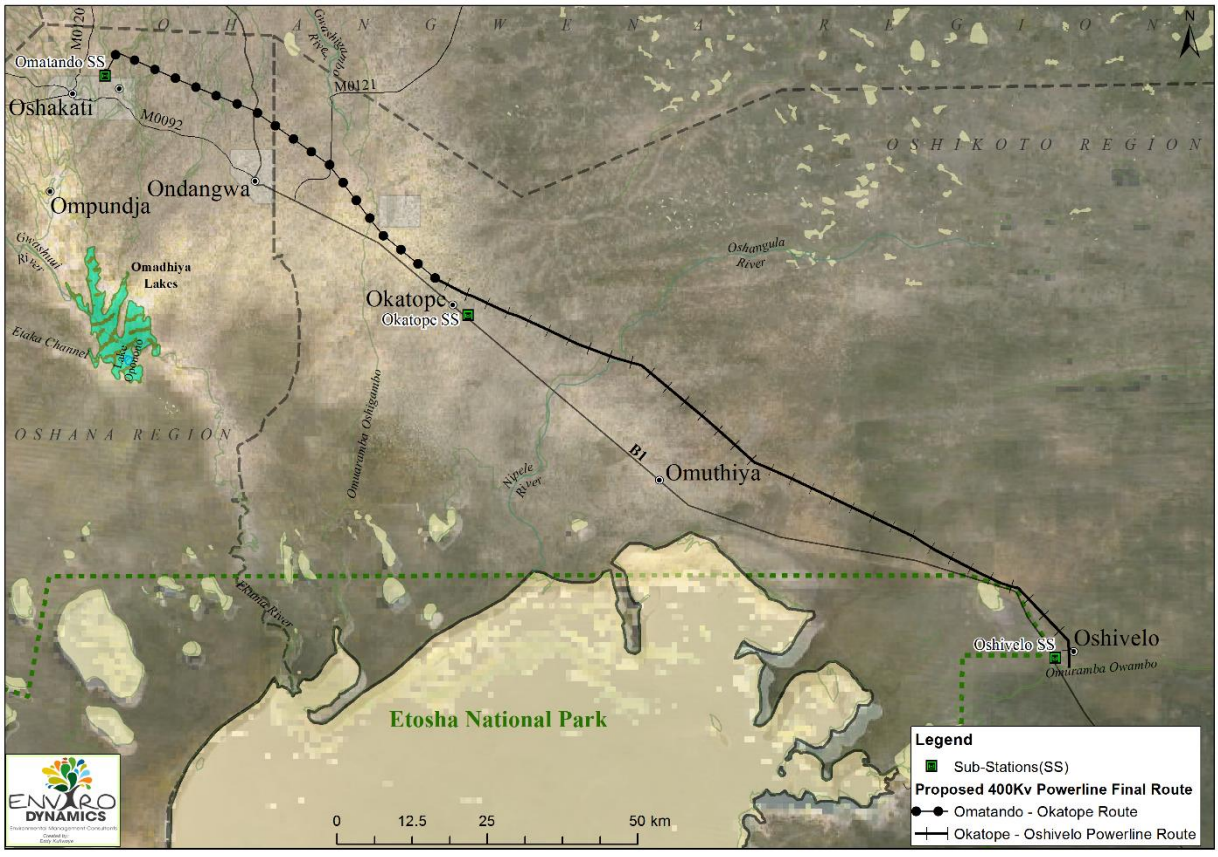


Figure 1: Proposed transmission line route from Omatando SS to Oshivelo SS.

2 LEGAL REQUIREMENTS

Summarised below (**Table 1**) are the activities associated with the construction and operation of the transmission line that have specific requirements in terms of national legislation (such as permits).

Table 1: Activities requiring permits in terms of National Legislation

LEGISLATION	REQUIREMENT
Labour Act 11 of 2007	• Regulations relating to the health and safety of employees at work are contained in GN 156/1997 (GG 1617). Must be complied with on this project.
Forestry Act No 27 of 2004	• Provision for the protection of various plant species. A photographic index of the sensitive plant species occurring along the power line is contained in **Appendix A** (Vegetation Management Plan). A **permit** will be needed for removal or destruction of protected species such as *Acacia erioloba*. • The act also requires any removal of any living tree, bush or shrub growing within 100 metres of a river, stream or watercourse to be done under to auspices of a permit issued by an appropriate official from the Directorate of Forestry. • The forms can be obtained **from Ms Ebben Haufiku at the Ongwediva forestry office: Tel +264 65 230 0947**. A period of three months should be allowed for obtaining this permit. Species and numbers/quantities involved will need to be specified.
Nature Conservation Ordinance 4 0f 1975	• Permit needed for the removal or destruction of protected species such as *Acacia erioloba* and *Ficus sycomorus* (See **Appendix A** for a complete list).
National Heritage Act No 27 of 2004	• No archaeological/heritage site or cultural remains may be removed, damaged, altered or excavated. • Section 48 sets out the procedure for application and granting of **permits**, such as the permit required in the event of damage to a protected site occurring as an inevitable result of development. Section 51 (3) sets out the requirements for impact assessment. • Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. Contact: **Karl Aribeb (061-244 375)**

3 VEGETATION

For mitigation measures pertaining to the management of affected vegetation for Portion 2, please refer to the Vegetation Management Plan (**Appendix A**).

4 BIRDS

4.1 DESCRIPTION

The proposed transmission line route traverses areas adjacent to the Etosha Pan, Lake Oponono and the Cuvelai Drainage, which are all included in the List of Wetlands of International Importance (Ramsar Convention on Wetlands, 2012). Namibia is a signatory to this convention and as such the conservation of these Ramsar sites and their associated water birds are a national concern. The fact that Etosha serves as a focus for so many birds means that birds will fly away from and towards this area, where they might conflict with the proposed power line to the north.

The wider area traversed by the proposed transmission line route includes habitats, which collectively are frequented, to various degrees, by approximately 200 bird species. Pallett (2014) identifies two distinct sections (d and e) (**Figure 2**) along Portion 2 that are, to varying degrees, potentially sensitive in terms of bird-powerline interactions (**Table 2**):

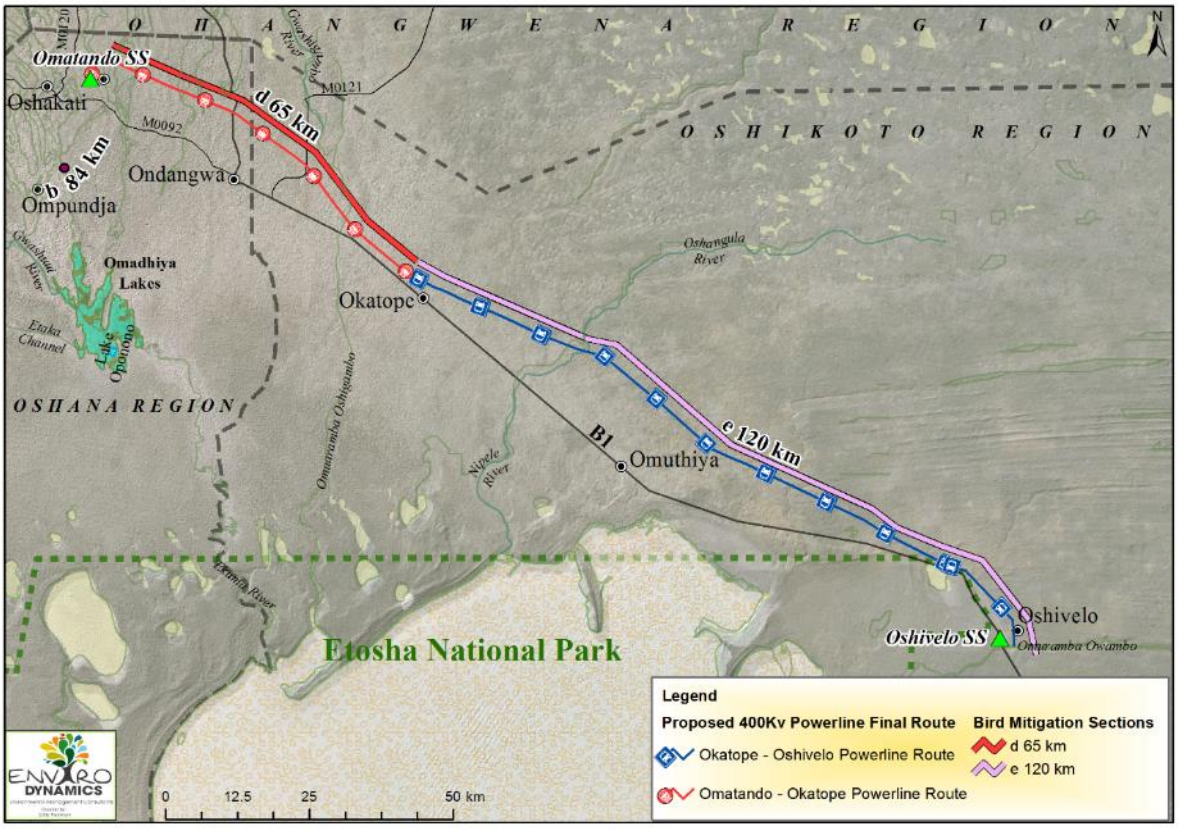


Figure 2: Sections of the proposed route likely to be frequented by specific birds.

Table 2: Vulnerable Red Data bird species potentially affected by the transmission line

SECTION	HABITAT	VULNERABLE RED DATA BIRDS
Section d	Medium-settled areas with scattered homesteads, fields and open grazing land. Occasional oshanas	Tawny eagle, martial eagle, bateleur, Cape vulture, lappet-faced vulture, white-headed vulture, white-backed vulture, peregrine falcon, western red-footed kestrel, black-winged pratincole, Ludwig's bustard, kori bustard, violet woodhoopoe, yellow-billed oxpecker, maccoa duck
Section e	Medium- to sparsely-settled areas with occasional oshanas, grading into eastern Kalahari woodland in the south.	Blue crane, wattled crane, grey crowned crane, saddle-billed stork, marabou stork, maccoa duck, pallid harrier, greater flamingo, lesser flamingo. Tawny eagle, martial eagle, bateleur, secretary bird, Cape vulture, lappet-faced vulture, white-headed vulture, white-backed vulture, western red-footed kestrel, black-winged pratincole, Ludwig's bustard, kori bustard, violet woodhoopoe, yellow-billed oxpecker, Rueppell's parrot

Potential impacts on birds in the project area include:

- **Impact of collisions:** Red data species mostly likely to be affected are Tawny eagle, Bateleur eagle, Cape vulture, White-backed vulture, lappet-faced vulture, white-headed vulture, Secretary bird, marabou stork, saddle-billed stork, greater flamingo, lesser flamingo, great white pelican, blue crane (see **Figure 3**), wattled crane, Kori bustard, Ludwig's bustard.

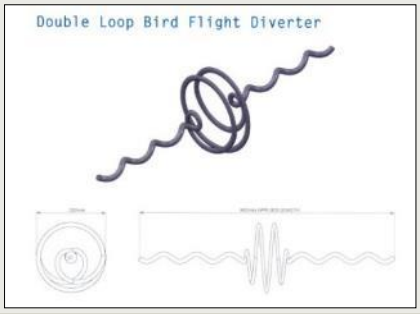
Figure 3: Blue crane

- **Disturbance of breeding:** Raptors in tall trees and other red data species such as tawny eagle (Endangered) and white-backed vulture (Near-Threatened). This is a particular concern in the eastern Kalahari woodland at the extreme eastern end of the route.

4.2 MITIGATION AND MANAGEMENT

At the onset of the project, while determining the optimal route, the potential effect on sensitive bird species was considered and the route selected to minimise the potential impact on birds. Therefore, the final selected route is expected to have the lowest potential impact on bird species.

However, it is inevitable that some bird-power line interactions will still happen along all parts of the route, threatening a range of wetland and savannah birds. The intensity of the threat differs from species to species, depending on their present population and range, and their vulnerability. The following mitigation measures are therefore recommended by Pallett (2014) based on **Figure 2** above:

SECTION	POTENTIAL BIRD SPECIES AT RISK OF COLLISION	MARKING DEVICES	INTERVAL OF BIRD DEVICES
Section d (on Figure 2): 17° 42' 51.024" S 15° 45' 52.019" E To 18° 3' 11.379" S 16° 14' 27.001" E	Raptors and as well as other red data species mentioned in table above.	• Double Loop Bird Flight Diverters (DLBFDs), also known as the TYCo Flight Diverter should be used to mark certain parts of this section as instructed by Mr John Pallett. 	10 m interval between devices on any one wire, with the devices staggered so that an oncoming bird faces a spiral every 5 m. The spirals should be coloured either black or white, and the two colours should alternate along the earth wires.
Section e (on **Figure 2**) 18° 3' 11.379" S 16° 14' 27.001" E To 18° 38' 13.915" S	Blue and wattled cranes as well as other red data species mentioned in table above.	Double Loop Bird Flight Diverters (DLBFDs), also known as the TYCo Flight Diverter should be used to mark this section.	

SECTION	POTENTIAL BIRD SPECIES AT RISK OF COLLISION	MARKING DEVICES	INTERVAL OF BIRD DEVICES
17° 11' 22.074" E Possible crane movements include those to the northeast of the Etosha Pan located in Angola.			

MITIGATION ACTION	RESPONSIBILITY	SCHEDULE
The transmission line should be marked as indicated in the table above to avoid or minimise the potential impact of collision by sensitive red data species. • Parts of section 'd' might warrant BFDs for a short distance, such as where the line traverses open pans or low ridges or a clump of relatively tall trees. Such sections will be identified by Mr John Pallett during the construction phase, and BFDs will be installed on those sections.	NamPower	Planning phase Construction
Enforce anti-poaching measures strictly (for birds and also other fauna), and this should be emphasised during induction to contractors. A member from the NamPower SHE Section should be actively involved, as often as practically possible, at the work sites which will help to keep levels of intentional and accidental disturbance to nesting birds and to other terrestrial wildlife low. Any contravention of the law (e.g. poaching) should be quickly and strictly dealt with so that it sends a deterrent message to others.	NamPower, Contractor	Throughout the whole project

4.3 MONITORING

MITIGATION/MONITORING ACTION	RESPONSIBILITY	SCHEDULE
• Any bird mortalities should be reported to the relevant NamPower staff member and to the coordinators of the Environmental Information Service (www.the-eis.com) so that the information is captured and available for future reference. • The condition of the devices should be recorded over time so that any deterioration is noted. This information will be useful in refining the future design of the relevant devices, for maximum longevity. Also, it will alert NamPower staff of the need to replace devices that lose their functionality.	NamPower	During standard maintenance operations
• Records should be kept by the relevant staff on how many nests are removed from which towers, and of what kind of birds (if they can be identified). This data should be forwarded to the relevant Environmental Officer in NamPower, as well as to the coordinators of the Environmental Information Service so the information becomes accessible to the public. • This information should be collected so that it is possible in future to recommend specific actions that will deter or prevent birds from nesting on the towers. Hard data will then be available to show if there are 'hot spots' of this problem and where to concentrate any mitigation effort.	NamPower	During standard maintenance operations

4.4 AUDITING

AUDIT ACTION	RESPONSIBILITY	SCHEDULE
• Final record including co-ordinates of areas to be marked with Bird Flight Diverters captured. • Record of specialist's visits, including co-ordinates of additional areas to be marked along "section d" and recommendations.	NamPower	Planning phase
• Records of bird mortalities and nest removals, including date and co-ordinates of instance and description of environmental conditions. • Production of annual report on "Hot Spot" analysis based on instances of bird mortalities and nest removals.	NamPower	Operation phase

AUDIT ACTION	RESPONSIBILITY	SCHEDULE
• Production of Bird Flight Diverter status report every five years.		

5 IMPACT ON THE RECEIVING SOCIO-ECONOMIC ENVIRONMENT

5.1 DESCRIPTION

Population densities varies along the proposed transmission line. Population density is sparse in the eastern part of the Oshikoto Region and increases as one moves west towards Oshakati and Ongwediva. In order to limit the potential impact the project is expected to have on populated areas, the project team attempted to align the route so as to avoid as many homesteads as possible. This was especially motivated by public concern that land is already scarce and that it would be difficult to find alternative land for relocation. The potential worst case scenario in terms of affected property is as follows:

- 165 fruit-bearing trees;
- 254 crop fields; and
- The relocation of 43 households.

Based on Simon's (2014) assessment, the following are likely to affect the existing socio-economic environment:

- the impacts on farming activities, especially on their ability to plant crops,
- the impact on homesteads which are generally constructed in their crop fields and
- the impact on fruit bearing trees which are traditionally used to harvest fruits from which they make ombike (liquor), omahongo(wine) and juice and which they also use as food.
- safety of children and adults working in the fields during the construction phase of the project,
- the spread of HIV/AIDS during construction, and
- the potential for temporary employment opportunities.

The social impacts associated with the relocation of homesteads and farming activities as well as the loss of fruit-bearing trees will be mitigated through compensation as per the Compensation Policy Guidelines for Communal Land of the Namibian Government. The calculations and assessment of these impacts are

included in the Relocation and Compensation Plan (**Appendix B**), prescribing how compensation should be handled on this project.

5.2 MITIGATION AND MANAGEMENT

POTENTIAL IMPACT	RECOMMENDED MITIGATION MEASURES	RESPONSIBILITY	SCHEDULE
Impacts on farming activities	Householders must be compensated: • For a 12 m wide stretch of land where the line crosses their fields; • To move and re-erect a hut or house as well as for fences, kraals and other farm infrastructure; • For fences crossed for the construction road; • for the loss of fruit-bearing trees which are mainly used for making juice and traditional alcoholic drinks but also for food in times of adversity or as pleasant tasting fruits	Nampower (according to the Relocation and Compensaatio n Plan included in **Appendix B**)	Planning phase
	Contact needs to be established with each of the affected farmers to negotiate the potential impacts on their properties.	Survey team	Planning phase
	Ensure that poles are not placed in the middle of the cultivated areas of crop fields. It should be just outside or on the edges of the fields.	Nampower	Planning phase
	Construction should take place outside the cropping season and should be completed before the ploughing season is to commence.	Nampower	Planning phase
	Excess soil from excavations may not be placed in the fields. It should be dispersed in the area of the pole after backfilling is completed.	Nampower Contractor	Constructio n phase
	Movement of construction vehicles across the fields during the erection of the towers and the stringing of the lines needs to be limited as far as possible. Existing tracks should be used to at least reach the tower sites rather than to drive through the fields. A detailed plan with routes to the poles	Nampower Contractor	Prior to construction and during construction phase

POTENTIAL IMPACT	RECOMMENDED MITIGATION MEASURES	RESPONSIBILITY	SCHEDULE
	should be produced and availed to the contractor.		
Safety around work areas	The Contractor should compile a Safety Management Plan, which should include as a minimum the following: • Excavations should be left open for an absolute minimum time. • Demarcate the following areas with danger tape: o All excavation works; o Soil and other building material stockpiles; and o Temporary waste stockpiles • Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active. • Work areas must be set out and isolated with danger tape on a daily basis. • All building materials and equipment are to be stored only within set out and demarcated work areas. • Only construction personnel will be allowed within these work areas. • A Senior Headmen of the area should be enlisted to inform residents to stay away from construction machinery and activities and to ensure that their children are kept away or at least remain at a safe distance.	Nampower Contractor	Prior to construction and during construction phase
Road safety	Only Roads Authority (RA) recognised access points may be used when turning off a RA proclaimed road (trunk, main, district and farm roads). Where a deviation from this is unavoidable, appropriate temporary warning signs should be erected and clearly visible to road users.	Nampower Contractor	Prior to construction and during construction phase
Spread of HIV/AIDS	Contractor staff should be subjected to an HIV/AIDS prevention programme and be made aware of the dangers of unprotected sexual relations with the local population.	Nampower Contractor	Prior to the commencement of construction

POTENTIAL IMPACT	RECOMMENDED MITIGATION MEASURES	RESPONSIBILITY	SCHEDULE
	The risks of multiple and concurrent partnerships should be included in the prevention programme. Traditional leaders of the area should be sensitised and subjected to the prevention programme. They are then required to share this with the local community.		and once a month thereafter.
Temporary employment opportunities	Local labour should be utilized where possible and as and when required. Local leaders could help with recruitment and the senior headman should be approached from the outset of the project to work out a methodology according to which the contractor can do recruitment. The recruitment process should be as inclusive as possible, recruiting people living along the line equally as they are available.	Nampower Contractor	Construction
Construction workers campsite	Contractors must supply their workers with sufficient amounts of fire wood; no live natural vegetation may be used for fire wood.	Nampower Contractor	Construction

5.3 AUDITING

POTENTIAL IMPACT	RECOMMENDED AUDIT ACTION	RESPONSIBILITY	SCHEDULE
Impacts on farming activities	Records of all compensation captured.	Nampower (according to Relocation and Compensation Plan **Appendix B**)	Planning phase
	• Records of private property (including crop fields) affected by transmission line servitude and structures and access roads captured; • Records of projected construction periods and duration relative to cropping and ploughing times captured.	NamPower	Planning phase

POTENTIAL IMPACT	RECOMMENDED AUDIT ACTION	RESPONSIBILITY	SCHEDULE
	Records of movement of topsoil stockpiles captured	Nampower Contractor	Construction phase
Safety around work areas	• Safety Management Plan compiled and available on-site. • Work safety plan records captured. • Safety incident records captured.	Nampower Contractor	Prior to construction and during construction phase
Road safety	Road access design drawing (for access to Trunk, Main and District roads) compiled and issued to all personnel operating vehicles.	Nampower Contractor	Prior to construction and during construction phase
Spread of HIV/AIDS	Awareness training minutes and attendance register captured.	Nampower Contractor	Prior to the commencement of construction and monthly thereafter.
Temporary employment opportunities	Local labour records captured.	Nampower Contractor	Construction

6 ARCHAEOLOGY

6.1 DESCRIPTION

The transmission line route runs immediately south of one archaeologically sensitive site (QRS 197/2), which is represented by a floodplain north of Ondangwa, which covers an area of approximately 4 ha. Located within this floodplain are approximately eight Sycamore Fig trees, most of which have a trunk width of 2 – 3 m (**Figure 4**). According to Kinahan (2014) an early Oshindonga village settlement might have existed within this site. Furthermore, based on the presence of the large clump of potentially very old Sycamore fig trees, as well as the presence of pottery in the topsoil, it is suspected that a royal homestead may have been located within this site.

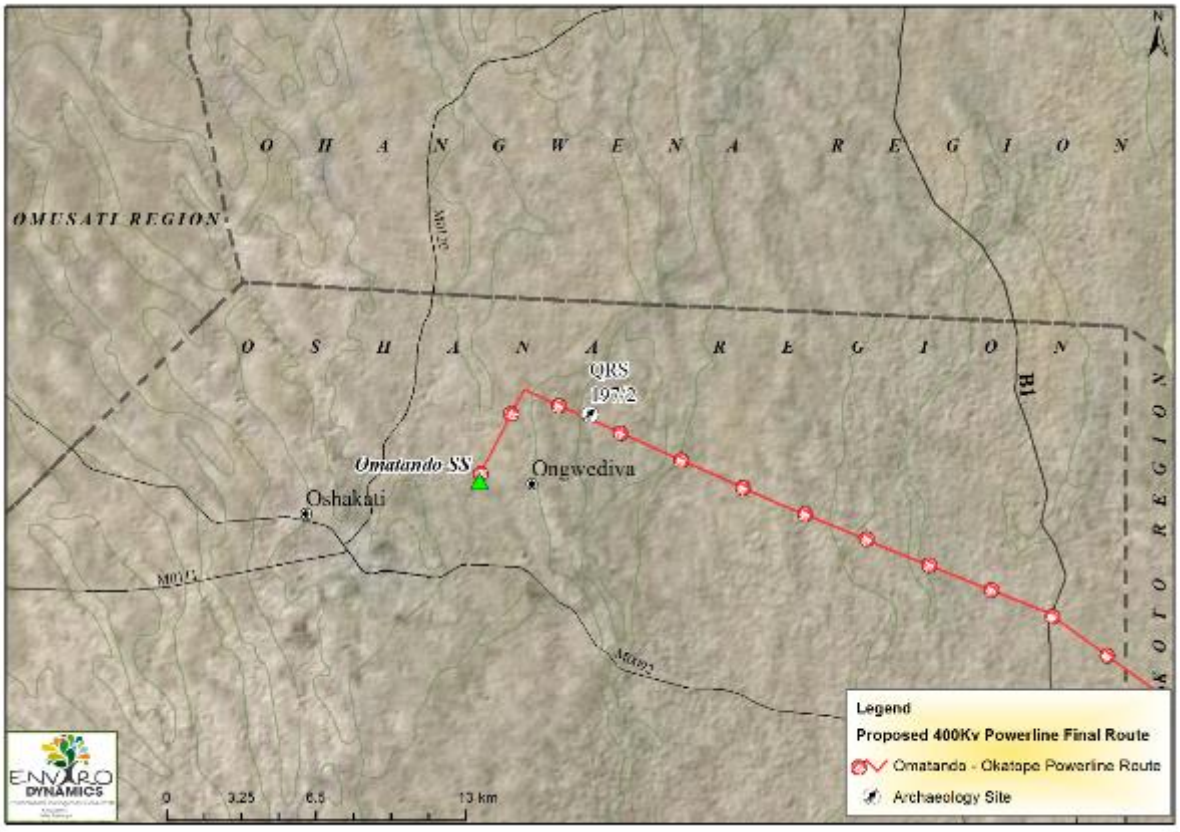


Figure 4: Location of nearby archaeological site in relation to the proposed transmission line route.

6.2 MITIGATION AND MANAGEMENT

MITIGATION/MONITORING ACTION	RESPONSIBILITY	SCHEDULE
A minimum of 75 m radius from the fig-tree grove – QRS 197/2, should kept clear of pylons, servitude tracks, fences and other activities associated with construction.	NamPower	Prior to construction, during construction, operation and decommissioning.
Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a "change find" procedure should be applied. The details of this procedure are highlighted below:	NamPower	When necessary.
• If operating machinery or equipment stop work • Identify the site with flag tape • Determine GPS position if possible • Report findings to foreman	Person identifying archaeological or heritage material	
• Report findings, site location and actions taken to superintendent • Cease any works in immediate vicinity	Foreman	
• Visit site and determine whether work can proceed without damage to findings • Determine and mark exclusion boundary • Site location and details to be added to project GIS for field confirmation by archaeologist	Super intendant	
• Inspect site and confirm addition to project GIS • Advise the National Heritage Council (NHC) and request written permission to remove findings from work area • Recovery, packaging and labelling of findings for transfer to National Museum	Archaeologist	
Should human remains be found, the following actions will be required: • Apply the change find procedure as described above. • Schedule a field inspection with an archaeologist to confirm that remains are human. • Advise and liaise with the NHC and Police	Archaeologist NHC Police	When necessary.

• Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.		

6.3 AUDITING

MITIGATION/MONITORING ACTION	RESPONSIBILITY	SCHEDULE
75 m radius from archaeological site QRS 197/2 demarcated and free of pylons, servitude tracks, fences and other activities associated with construction.	NamPower	Prior to construction, during construction, operation and decommissioning.

7 DECOMMISSIONING AND REHABILITATION

The decommissioning of this project is not envisaged. However, in the event that this it is decommissioned the following mitigation measures should be adhered to.

Table 3: Decommissioning phase mitigation measures

ASPECT	MITIGATION MEASURE
Construction related activities	Many of the mitigation measures prescribed for construction activity for this development (see **NamPower's General EMP**) are applicable to the decommissioning of this project. The following chapters/subsections of the **NamPower's General EMP** are **NOT** applicable and should be ignored: • Chapter 2 (subsection 3 – Surveyor) • Chapter 3.3 (Archaeological and Cultural Sites) • Chapter 4.5 (Bush Clearing) • Chapter 5.4 (Flora); and • Chapter 5.6 (Aesthetic Quality).
Rehabilitation	• Rehabilitation should be carried out so as to facilitate the re-establishment of the affected area's pre-disturbance form and structure. • The concrete foundations should be dug up to a minimum depth of 500 mm below the surface of the ground. • The remaining concrete should be completely covered with soil and care should be taken to ensure that no areas that could lead to potential erosion remain (e.g. slopes or slightly exposed concrete. • As for the concrete that is removed from the foundations: Pieces of concrete may be used as back-fill when constructing the new pylons (if this is the case), i.e. the broken concrete may be used to fill up the holes for the new foundations. If no new line is being assembled and erected then all concrete should be transported to the nearest local authority's waste disposal facility. • Excavations may only be backfilled with soil or subsoil; • Rehabilitated areas need to match the contours of the existing landscape; • Take note of drainage channels in the vicinity of decommissioned areas. These areas should not be higher (or lower) than these drainage channels. This ensures the efficiency of revegetation and reduces the chances erosion; • Available topsoil should as far as possible be spread evenly across areas to be rehabilitated; • Deep ripping of areas to be rehabilitated is required, not just simple scarification, so as to enable rip lines to hold water after heavy rainfall; and • Ripping should be done along slopes, not up and down a slope, which could lead to enhanced erosion. • The option of re-seeding should be investigated in disturbed areas where minimal, or no revegetation has occurred within 1 year.

2015

Environmental Impact Assessment for the Proposed 400 kV Transmission Line from Omatando Substation to Oshivelo Substation (Portion 2)

General Environmental Management Plan

NamPower

ENVIRO DYNAMICS

1 SCOPE

The purpose of this document is to provide regulations, regarding the environment, to any contractor whom NamPower appoints for any construction activity (this includes outside contractors as well as NamPower's own construction people).

This document is to form part of the contract, and all recommendations and constraints laid out in this document are enforceable under the general conditions of contract.

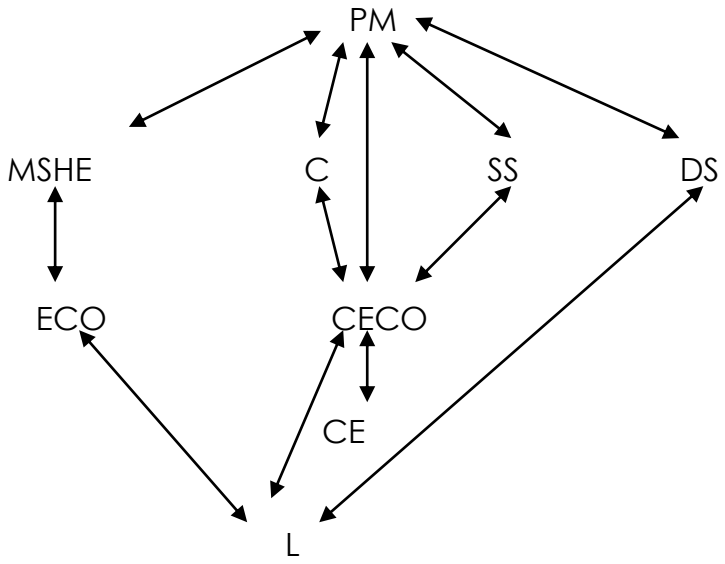
This management plan has a long-term objective to ensure that:

- Environmental management considerations are implemented from the start of the project.
- Precautions against damage and claims, arising from damage, are taken promptly.
- The completion of the project is not delayed due to problems with land owners arising during the course of construction.

NamPower needs a commitment from the NamPower Project Manager and contractor on the following issues:

- To take into consideration the landowners and their rights.
- To always behave professionally on and off site.
- To ensure quality in all work done – technical and environmental.
- To resolve problems and claims arising from damage immediately, in order to ensure a smooth flow of operations.
- To underwrite NamPower's environmental policy at all times.
- To use this Environmental Management Plan for the benefit of all involved.
- To preserve the natural environment by limiting destructive actions on site.

1.1 REPORTING STRUCTURE



PM : NamPower project manager

MSHE : Manager: SHE

C : Contractor

DS : District supervisor

SS : NamPower site supervisor

ECO : NamPower environmental control officer

CECO: Contractor environmental control officer

CE : Contractor employees

L : Landowners

2 INTRODUCTION

Construction activities can have a major impact on the environment. It is thus crucial to take better precautions, in order to ensure that environmental damage is minimised. Though one cannot eliminate all damage, one can take certain steps to reduce the damage. These steps can only be successful if the Contractor makes a concerted effort and if NamPower make use of proper planning and enforcement.

This document presents the General Environmental Management Plan (GEMP) for NamPower. The objective of this GEMP is to achieve sound safety, health, and environmental performance (SHE).

This document is not site specific. For this project there is an additional annexure, stating the special conditions for that area, and these conditions along with the GEMP contain the environmental regulations for this project. This document is an official NamPower document and the contractor is contractually obligated to fulfil all the conditions stipulated in it.

This document will only address those issues related to the social and natural environment. A document dealing with the technical specifications will also be drafted and this document will deal with all the technical aspects.

1. PROJECT MANAGER

- Is responsible for the enforcement of the EMP.
- Must make sure that SHE requirements are included in the tender documents sent to the contractor.
- Must ensure that a SHE clause is included in the contract document and communicated to the contractor before the inception of the project.
- Must ensure that the contractor remains in compliance with the requirements of this EMP, through regular communication and monitoring.

2. NAMPOWER SHE SECTION

- Assist the Project Manager in ensuring the contractor remains in compliance with this EMP through.

- Provides SHE inductions for the contractors and their employees.
- Organize and implement monitoring and audit functions, in consultation with the Project Manager.
- Report back to the Project manager on contractor compliance to the EMP before the project close-off and final payment is made to the contractor.

3. SURVEYOR

- Ensures route alignment for the proposed power line is as per route given in the final EIA (or after consultation with the SHE section if no EIA has been done).
- Ensures that the final alignment of the route be fine-tuned to keep at least 50m away from any farm infrastructure (such as reservoirs, cattle kraals, pumps etc.).
- Ensures that the servitude or power-line route, should it run in parallel to a stream or riverbed has a buffer of between 15 m between the servitude and the river.
- Ensures that the ECO accompanies the surveyor during site handover. The surveyor is to align the straight sections of the power line so that its centre line would avoid significant tree species (such as a valuable shade trees or endangered tree species) as far as possible.
- Documents the removal of any economically valuable trees or bushes (such as valuable shade trees) and clearly communicated to the ECO the reasons for removal.
- The Surveyor, together with the ECO, should carefully consider the need to remove large trees in the servitude, and specify this only where technically necessary.
- Rocky outcrops and inselbergs in the project area are sensitive from an ecological aspect; they harbour vegetation worthy of conservation, and the final power-line alignment must avoid all such sites.
- The Surveyor should ensure all coordinates given in the EMP of environmental or social sensitive areas are included on the spanning sheets for the power-line prior to construction.

4. CONTRACTOR

- Is responsible for the implementation of the EMP.

- Ensuring all tasks undertaken under the scope of work, are in accordance both with NamPower's SHE policy as well as to the requirements of this EMP.
- Putting in writing a system of communication, in which all incidents and accidents are reported to the SHE section.
- Ensuring that all employees receive a SHE induction before the start of the project.
- Ensuring that the work being done does not create a nuisance to the residents or animals on the property. If the contractor deems to continue work after the usual working hours, in the evenings and at night or over weekends, he must obtain the landowner's permission before proceeding with such work.

The contractor shall notify NamPower of the following:

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

The employer has the right to ban any employees from the site, which have not attended SHE induction, until the time that they receive induction. The employer also has the right to stop all construction activities if it is found that a gross violation of the EMP is taking place.

Lines of communication should always be open to ensure proper and timely reaction to complaints. The reputation of both the contractor and NamPower is at stake and should be the drive for everybody involved to perform in excellence.

The concept of sustainability, sustainable development and the Triple Bottom line should be kept in mind at all times during the project. This will ensure that the three main issues of each project, namely: environmental issues, social issues and financial issues, are always in balance and that not one of them takes precedent over the others.

All rehabilitation work to the environment, that needs to be done, will be done at the expense of the contractor.

(Wherever the term employer is used, it should be assumed that the entity being addressed is NamPower.)

3 SOCIAL ENVIRONMENT

3.1 INTERACTION WITH LANDOWNERS

(Refer to Annex – Project Specific EMP Requirements)

3.1.1 Before work commences, NamPower should inform all affected landowners and authorities about the project, at least 14 days before the start of the project.

3.1.2 NamPower should secure all rights of way to cross over private properties. The contractors may not stray from the NamPower servitude. The contractor shall inform the owner or his legal representative before entering onto any private property, of his intention to do so and shall make such arrangements with such owner or his legal representative as may be necessary to ensure free and unhampered entry to, and movement on or over the property concerned, for the duration of the project. This should be done at least one month in advance and written proof of such communication should be available at all times.

3.1.3 Whenever reasonably possible, the contractor shall meet with the landowner / representative of the property, introduce himself and the company he represents and explain the scope of the work. The landowner / representative must have knowledge of the planned route and duration of work on the property prior to the commencement of the work. This shall be done in due courtesy to the owner / representative.

3.1.4 The contractor must ensure that the owner or his legal representative fill in forms containing the following information, before and after the contractor has worked on the property (these forms must be presented by the contractor to NamPower, whenever the company requests it) and a copy shall be handed to NamPower at the end of the project.

Before entry, to be completed and signed by the farm owner:

- Activities to be conducted on the farm (e.g. camping, construction etc.).
- Specific conditions to be met on the farm.
- Dates when entry is needed.

- Farmer's signature (if the farmer or his legal representative does not agree to sign the form, this must be noted on the form along with a list of names of all the people present at the meeting).
- Contractor's signature of commitment to adhere to the requirements.

Upon leaving the farm, to be completed and signed by the farm owner:

- Remarks on compliance and misconduct
- Issues still to be resolved

3.1.5 The success of the project depends on good relations with the landowners. Thus, the landowners must have knowledge of any changes to the construction and maintenance programme that might occur, but only if they are affected by it.

3.1.6 A system of communication must be devised by the contractor and made available to NamPower, in order to inform NamPower about all incidents and accidents (including those affecting the environment) and injuries sustained.

3.1.7 Appropriate contact numbers shall be made available to the landowner, to ensure open channels of communication and prompt responses to any queries and claims.

3.1.8 The rights if the landowner shall be respected at all times and all staff shall be sensitised to the fact that they are working on private property.

3.1.9 Where lines cross an inhabited area, all the necessary precautions shall be taken by the contractor to safeguard the lives and property of the inhabitants.

3.1.10 The contractor shall not interfere, under any circumstances, with build infrastructure belonging to the landowners.

3.1.11 A register shall be kept of all complaints from landowners. All claims shall be handled immediately to ensure timely rectification.

The following management objectives have been identified in terms of interaction with landowners:

- Minimise complaints from landowners.
- Prevent litigation due to outstanding claims.
- Successful completion of the contract and all landowners signing release forms.
- Maintain good relations with landowners.

Measurable targets:

- All claims investigated and settled within one month.
- No litigation due to unsettled claims.
- All landowners signing release forms within one month after completion of the contract.
- No delays in the project due to landowner interference.

3.2 ACCESS TO PRIVATE PROPERTY

(Refer to Annex – Project Specific EMP Requirements)

3.2.1 The movements of the Contractor, subcontractor, or their employees, are restricted to the areas of the servitude and any further encroaching on private property at any time are subject to the owner's permission.

3.2.2 Roads marked with no entry signs, shall not be used.

3.2.3 Fences or gates of landowners shall not be damaged when gaining access to the servitude.

3.2.4 Gates and locks shall be regularly monitored to ensure that they are secure.

3.2.5 Gates to be left as they are found. If found opened, they must be left open, and if closed, they must be closed again upon entry.

3.2.6 If no gates are available at crossing points, landowners shall be informed prior to the loosening and crossing of fences. Fences loosened and crossed shall be immediately restored to its original state and to the complete satisfaction of the landowner.

3.2.7 All gates shall be fitted with locks and kept locked at all times during construction. NamPower must be supplied with three copies of these keys. Once the contractor has left the site, all gates shall be fitted with NamPower locks.

The following management objectives have been identified in terms of access to private property:

- Properly installed gates to allow access to the servitude.
- Minimise damage to fences.
- Limit access to NamPower and contractor personnel with gate keys.

Measurable targets:

- No transgression of fencing procedures as mentioned above.
- No damage to fences and subsequent complaints from landowners.
- All gates equipped with locks and kept locked at all times to prevent unauthorised entry of people and the uncoordinated movement of animals.
- All fences properly tied of to gate posts.
- All gates properly and neatly installed according to specifications.
- No complaints about open gates.

3.3 ARCHAEOLOGICAL AND CULTURAL SITES

(Refer to Annex – Project Specific EMP Requirements)

3.3.1 Before construction, the contractor shall inspect the area for any heritage sites that may be of significance. These would include any mounds, walls packed of stones, gravesites etc. If any such site is found, the area shall be cordoned off, and NamPower must be informed, who will, in turn, inform the Monuments Council, MET or an Archaeologist.

3.3.2 All sites, discovered during construction activities, which appear to be of cultural or archaeological importance must be clearly marked and GPS readings taken. If the contractor or staff identify archaeological sites, they should immediately notify the National Heritage Council in terms of the National Heritage Act (27 of 2004). No artefacts shall be removed or damaged under any circumstances. NamPower must call in relevant experts to determine the significance of the sites.

3.3.3 All cultural sites should be clearly marked and left undisturbed during bush-clearing, construction and maintenance activities.

3.3.4 Graveyards may not be intruded upon during construction, operation and maintenance activities

3.3.5 No graves shall be moved, and the surveyor shall manoeuvre the line in such a way to prevent any removal of historic sites.

3.3.6 Sites of historical interest, in close proximity to the servitude, shall be protected and treated with respect.

The following management objectives have been identified in terms of archaeological and cultural sites:

- Protection of archaeological sites and land considered to be of cultural value.
- Protection of known sites against vandalism, destruction, and theft.
- The preservation and appropriate management of new archaeological finds, should these be discovered during construction.
- Protection of sites and land considered to be of cultural value.

Measurable targets:

- No destruction of or damage to known sites.
- Management of existing sites and new discoveries.
- No litigation due to the destruction of sites.

3.4 SOCIAL IMPACTS

(Refer to Annex – Project Specific EMP Requirements)

3.4.1 Personnel should limit their contact with farm workers and other permanent residents of the area.

3.4.2 Personnel should be properly educated about the impact of HIV / AIDS.

3.4.3 Any person making himself guilty of violence, harassment or any other activity deemed inappropriate by the landowner, must immediately be removed from the site.

3.4.4 The distribution or supply of intoxicating liquor or drugs of any kind by the employees of the contractor or any contractor is strictly prohibited.

The following management objectives have been identified in terms of social impacts:

- Minimise incidents involving contractor employees.

Measurable target:

- No complaints received by landowners concerning inappropriate behaviour of contractor employees.

4 PHYSICAL ENVIRONMENT

Site establishment shall take place in an orderly fashion and all facilities shall be installed at campsites before the main workforce move onto the site.

A method statement is required from the contractors that include the layout of the camp, management of ablution facilities, and wastewater management.

4.1 WASTE MANAGEMENT

(Refer to Annex – Project Specific EMP Requirements)

4.1.1 Separate waste containers must be provided for hazardous waste, potentially hazardous waste, general waste, and construction waste. Hazardous / harmful waste must be clearly distinguishable as such.

4.1.2 Containers shall be provided with lid or netting to prevent the waste from being removed by scavengers or wind. Waste containers should not be over-filled.

4.1.3 A waste pit for biodegradable materials may be used at the campsite. Upon leaving the site, this pit must be covered with at least one metre of soil.

4.1.4 No waste may be burned on site. All waste products must be moved to the nearest waste dump at regular intervals of at most two weeks.

4.1.5 Illegal dumping and littering shall not be tolerated.

4.1.6 Sites where waste is stored must be adequately protected from animals that might frequent the area.

4.1.7 No concrete waste may be left unburied at the site. Care should be taken to ensure that this buried waste is not an aesthetic problem to the landowner or a technical constraint during maintenance.

4.1.8 Ensure that the campsites, the work site, and the surroundings are kept in a neat condition at all times and that windblown litter is cleared on a daily basis.

The following management objectives have been identified in terms of waste management:

- To keep the servitude neat and clean.
- Disposal of rubble and refuse in an appropriate manner.
- Minimise litigation.
- Minimise landowner complaints.

Measurable targets:

- No rubble or refuse lying around on site.
- No incidents of litigation.
- No complaints from landowners.
- No visible concrete spillage on servitude.
- No signs of visible litter in the campsites or on the servitude.

4.2 HAZARDOUS MATERIAL

4.2.1 A register shall be kept on all hazardous substances and be available for inspection at all times.

4.2.2 Storage areas shall display the required safety signs.

4.2.3 Fuels must be stored in an adequate bunded area. Bundwalls may be made from sandbags. The area within the bundwalls should be lined with a plastic layer covered with a layer of at least 50 mm of sand. The bundwalls must be high enough to contain any major spills that may occur.

4.2.4 Hazardous substances should be stored in a well-ventilated area, and behind lock and key.

4.2.5 Used oils, fuel, paints, grease, and solvents should be stored in drums or other suitable containers, which must be labelled, sealed, and removed from the site to an appropriate disposal site or recycling facility.

4.2.6 Areas shall be monitored for spills and any spills shall be contained, cleaned, and rehabilitated immediately.

4.2.7 Oil contaminated soil must be collected, stored and removed for disposal at an appropriate waste storage facility. The area, from which the contaminated soil was taken, must be filled with new soil. The new soil must be free of contamination, and should not be

taken from a spot within a 100-metre radius of where the spill occurred.

4.2.8 In the event of a hazardous spill on site or during transportation of these substances to or from the site, the followings actions must be taken:

4.2.8.1 Stop the source of the spillage immediately.

4.2.8.2 Immediately contain the spillage by shovelling a soil bund wall with around it.

4.2.8.3 Absorb the oil spill as quickly as possible with the supplied spill kit.

4.2.8.4 Report the spill to the site supervisor.

4.2.8.5 In case of a major spill the Manager: SHE (NamPower) must be contacted and arrangements must be made for the implementation of the necessary clean-up activities.

4.2.8.6 Collect contaminated soil, water and other materials and dispose of it at an appropriate hazardous waste storage site.

4.2.9 Any rehabilitation activities needed because of an oil spill will be at the cost of the contractor.

4.2.10 Have sufficient fire fighting equipment available at the campsite.

4.2.11 Ensure that all staff are adequately protected and educated about the safe and proper handling and disposal of hazardous substances.

4.2.12 Hazardous substances should not be stored in an area that is situated within the migratory path of large mammals.

The following management objectives have been identified in terms of hazardous materials:

- Thorough management of hazardous waste materials.
- The protection of the natural integrity of the environment.
- Adequate staff awareness of procedures and Emergency Response Plans.

Measurable targets:

- Zero spills.
- No environmental pollution occurring.
- Management according to procedures.

4.3 TEMPORARY CAMPSITES

(**No Campsites may be constructed in the parks**)

4.3.1 Should the contractor wish to camp on private or public property, he will arrange the exact campsite , remuneration, dates of occupation and any special conditions with the relevant landowner at least one month prior to site establishment.

4.3.2 Campsites should not be located in an area that is situated within the migratory path of large mammals.

4.3.3 The location of campsites must be discussed with the landowner and the contractor may only use those areas indicated by the landowner, as campsites.

4.3.4 Care should be taken to protect campsites from large mammals, without causing harm or injury to the animal.

4.3.5 Temporary campsites are to be located close to existing tracks, preferably on already disturbed ground.

4.3.6 Throughout the period of the contract, activities are to be restricted to the designated area.

4.3.7 Adequate ablution facilities must be provided to the staff. These facilities may not be located within 100 m of any river, stream channel, pan, dam, or borehole (even if the water source is dry) and should be properly maintained in a hygienic and good working order.

4.3.8 The staff should be properly trained on the procedure that should be followed when no ablution facilities are available.

4.3.9 On site waste management facilities are to be provided.

4.3.10 Fire extinguishers, first aid kits and any other relevant safety equipment must be easily accessible at all times.

The following management objectives have been identified in terms of temporary campsites:

- Ensure that proper sanitation is achieved.
- Control over actions and activities are close proximity to inhabited areas.
- Campsites and toilet facilities maintained in a neat and hygienic condition.

Measurable target:

- No complaints from landowners regarding sanitation.
- No complaints from landowners.
- No damage to private property.

4.4 MAINTENANCE OF VEHICLES

(Refer to Annex – Project Specific EMP Requirements)

4.4.1 Vehicle maintenance and refuelling activities must be conducted within a bunded area.

4.4.2 Vehicle maintenance and refuelling activities may not be carried out outside the campsite, except in cases of emergency.

4.4.3 During servicing of vehicles, especially during emergency veld repairs, a suitable drip tray shall be used to prevent oil spills.

4.4.4 In the event of a breakdown in the veld any oils spills shall be cleaned up immediately. The following shall apply:

4.4.4.1 All contaminated soil shall be removed and placed in containers. Contaminated soil can be taken to one central point, where soils can be treated or removed for disposal at an approved site.

4.4.4.2 Bigger spills can be treated on site with absorbent chemicals such as Peat-Sorb.

4.4.4.3 Major spills must immediately be reported to the project manager and the contractor shall employ a specialist contractor for the bio-remediation of contaminated soil.

The following management objectives have been identified in terms of vehicle maintenance:

- Prevention of pollution of the environment.
- Minimise chances of transgression of national legislation.

Measurable targets:

- No pollution to the environment.
- No litigation due to the transgression of national legislation.
- No complaints from landowners.

4.5 BUSH CLEARING

(Refer to Annex – Project Specific EMP Requirements)

4.5.1 The objective of bush clearing is to trim out or clear the minimum number of trees and bush necessary for the safe electrical operation of the power line.

4.5.2 Vegetation shall only be cut to allow for the passage of the pilot-cables and headboard. No vegetation clearing shall be allowed across ravines and gullies, as this vegetation will very rarely interfere with the clearance to a strung conductor.

4.5.3 A strip, only wide enough to allow for vehicular movement, shall be cleared for access roads.

4.5.4 While clearing the trees near the power line route, falling distance of any tree or trees, which are likely to fall on the conductors of the power line, as has been identified by visual inspection, shall be considered. Such "high risk" trees, or its branches, shall be felled only under supervision of a NamPower representative.

4.5.5 It is imperative that while maintaining the specified clearances, all tree branches capable of producing off-shoots in due course shall be cleared in such a way that it will be impossible for any of the off-shoots of these trees to grow towards the power lines.

4.5.6 Near the power line, overhanging branches are impermissible.

4.5.7 Big trees with large root systems shall be cut manually and removed, as the use of a bulldozer will cause major damage to the soil when the root system is removed. Stumps shall be treated with an approved herbicide.

4.5.8 Environmental sensitivity shall be taken into account when clearing is done. Laws protect environmentally sensitive areas (such as wetlands, river crossings, areas of endemicity etc) and it is essential to obtain permits before the undertaking of any activities in such areas. The sketch plans should indicate existing or potential problem areas identified during site inspection of the power line route.

4.5.9 The contractor, NamPower and the landowner prior to bush clearing shall discuss all environmental factors. Should there be any changes to the route due to environmental factors, NamPower must first be consulted.

4.5.10 All the felled branches, cleared bushes/shrubs, and tree stubs etc. shall be removed from the line route and carted away in order to allow the free movement of maintenance vehicles and crews. This plant material may however not remain in heaps and should be

scattered over the terrain. When needed, this plant material can also be used to combat soil erosion.

4.5.11 If a cleared track is required along the route of the line (to allow for the free movement of vehicles) all protruding sharp rocks must be cut level or covered with imported gravel, levelled and compacted. Holes must be filled with gravel, levelled, and compacted.

4.5.12 No burning of vegetation is allowed as an alternative to cutting of vegetation.

4.5.13 To minimise soil erosion, vegetation should be trimmed as apposed to the complete removal of vegetation.

4.5.14 Manual bush clearing, as apposed to clearing using a bulldozer, is preferable, in order to minimise vegetation loss and hence reduce the risk of soil erosion.

4.5.15 Where there are no real obstacles, where vehicles can simply drive over an area, or where obstacles can simply be removed by hand, blading shall not be used.

4.5.16 When manual bush clearing is impractical, blading shall be used, but the blade shall be kept approximately ten centimetres from the soil surface to minimise the impacts to the soil surface and top layer, small plants and the root systems of larger plants.

4.5.17 Where clearing is done near a river, the contractor must ensure that no felled bushes/branches/shrubs are left behind in the riverbed.

4.5.18 No bush clearing shall be allowed on river- and stream banks unless the line crosses the river or stream and this vegetation poses a risk to the line. In such cases, NamPower should be consulted on the action to be taken.

4.5.19 A permit is required from the Ministry of Environment and Tourism for the removal of vegetation within 100m from a riverbed (in terms of the Forest Act of 2001). NamPower is responsible for applying for such a permit.

4.5.20 No bush clearing shall be allowed on river-and stream banks. Where the power line crosses river beds, an attempt should be made to prune riverine vegetation (over 4 m in height) as opposed to its removal.

4.5.21 The National Botanical Research Institute (NBRI) staff should be tasked to do rescue missions of any conservation worthy plants encountered while doing the final survey of the route.

4.5.22 No bush clearing is allowed outside the servitude.

4.5.23 Reasonable precautions shall be taken to avoid damage to land, crops, grazing fields, farm gates, or property.

4.5.24 No cultivated lands, fences, or structures (permanent or temporary) may be removed or damaged, unless NamPower's written consent for doing so has been obtained.

4.5.25 All damage to commercial crops shall be recorded immediately and a photographic record of such damage must be kept.

4.5.26 Alien species and declared weeds must be identified and eradicated during rehabilitation.

The following management objectives have been identified in terms of bush clearing:

- Minimise damage to vegetation.
- Keep servitude as natural looking as possible.
- Minimise interference by vegetation to flow of electricity.
- Minimise possibility of erosion due to removal of vegetation.
- Minimise removal of plant material on river and stream embankments.
- Eradication of alien invader species.

Measurable targets:

- Only 3 m vegetation cleared for the maintenance road.
- No trees and vegetation removed unnecessarily.
- No vegetation interfering with structures and statutory distances upon completion of the contract.
- No de-stumping of vegetation on river and stream embankments.
- No visible erosion scars three months after the completion of the contract due to vegetation removal.
- No litigation due to unauthorised removal of vegetation.
- All alien invaders eradicated from the servitude.

4.6 ACCESS ROADS

(Refer to Annex – Project Specific EMP Requirements)

4.6.1 Off-road driving and the creation of tracks, other than those approved by the relevant landowner, are prohibited and will be regarded as unwanted tracks and unwarranted disturbed areas.

All unwanted tracks and unwarranted disturbed areas must be rehabilitated at the cost of the contractor, before the contract will be considered complete.

4.6.2 All conditions that the landowner may have shall be noted and adhered to. All vehicle movement shall be along the existing roads and access tracks – where possible. Vehicles should be driven at moderate speeds and special care should be taken, especially in wet weather, to avoid eroding tracks. Multiple tracks (i.e. parallel tracks) are to be avoided at all times.

4.6.3 Damage to access roads due to the movement of vehicles must be reported to the Project Manager and the landowner. All repairs must be done immediately and to the satisfaction of the landowner.

4.6.4 No roads shall cut trough a river and stream banks as this may lead to erosion. If no other alternative is available, care should be taken to stabilise the bank.

4.6.5 Existing drifts and bridges may be used if the landowner gives his consent. Such structures shall then be thoroughly examined for strength and durability before they are used.

4.6.6 New drifts and bridges shall only be constructed with the approval of NamPower and the landowner.

4.6.7 No roads shall be constructed on slopes of more than 20% unless such roads follow contours. In such areas, the contractor shall use existing roads or alternative methods of construction.

4.6.8 The installation of concrete pipes and drifts, to facilitate access, shall be at the discretion of the project manager.

4.6.9 Dangerous crossings shall be marked and speed limits shall be enforced (refer to 5.7 for further details).

4.6.10 All agreements reached should be documented and signed and no verbal agreements should be made.

The following management objectives have been identified in terms of access roads:

- Minimise damage to existing access roads.
- Minimise damage to the environment due to construction of new access roads.
- Minimise loss of topsoil and enhancement of erosion.

Measurable targets:

- No claims from landowners due to damage on existing access roads.
- No erosion visible on access roads, three months after completion of construction.
- No loss of topsoil due to runoff on access roads.
- No unwanted parallel tracks and unwarranted disturbance.

4.7 INFRASTRUCTURE

(Refer to Annex – Project Specific EMP Requirements).

4.7.1 No telephone lines shall be dropped during the stringing operations.

4.7.2 Where pipe lines are found along the route, the depth of the pipes under the surface shall be determined to ensure that proper protection is afforded to such structures.

4.7.3 Any damage to access roads must be reported immediately and any damage must be rectified as soon as possible.

4.7.4 Upon completion of the project all roads shall be repaired to their original state.

4.7.5 On gravel roads, the speed limit for trucks will be 40 km/h and for other vehicles, it is 60 km/h – 80 km/h depending on the condition of the road.

4.7.6 Power cuts to facilitate construction and especially stringing must be carefully planned. If possible, the disruptions must be kept to a minimum and should be well advertised and communicated to the landowners at least one month in advance.

4.7.7 Care must be taken not to damage irrigation equipment, lines channels and crops.

4.7.8 The location of airstrips should be carefully considered and the air safety laws should be kept in mind.

The following management objectives have been identified in terms of infrastructure:

- The control of temporary or permanent damage to plant and installations.
- Control of interference with normal operation of plant and installations.

- Securing of the safe use of infrastructure, plant, and installations.

Measurable targets:

- No unplanned disruptions of service.
- No damage to any plant or installations.
- No complaints from authorities or landowners.
- No litigation due to losses of plant, installations, and crops.

5 BIOLOGICAL ENVIRONMENT

5.1 RIVERS, VLEIS, AND PANS

(Refer to Annex – Project Specific EMP Requirements)

5.1.1 Surface and ground water shall not be polluted under any circumstances. Storm water shall be managed to ensure that it does not become polluted.

5.1.2 All hazardous substances at the site shall be adequately stored and accurately identified, recorded and labelled.

5.1.3 Temporary toilet facilities (preferably chemical toilets) used at the camp site shall be sited away from any riverbed, vleis, or pan, even when dry.

5.1.4 Permanently wet areas should be shown on the spanning sheets. No vehicles shall be allowed in such areas. Only existing roads through such areas may be used with the approval of the landowner.

5.1.5 No equipment that can cause irreparable damage to wet areas shall be used.

5.1.6 There must be a buffer line of at least 15m between the servitude of the power line and any water-containing body (rivers, vleis and pans), if the power line happens to run parallel to it.

5.1.7 A stream or riverbed should not be obstructed with vegetation or any other materials cleared during bush clearing. (Also refer to point 4.5.16 and 4.5.17. Also refer to point 4.6.4 and 4.6.5).

The following management objectives have been identified in terms of rivers, vleis, and pans:

- Avoid permanently wet areas to prevent damage.
- Minimise damage to river and stream embankments.
- Minimise erosion of embankments and subsequent siltation or rivers and streams.

Measurable targets:

- No damage to wetland areas and river banks.
- No access roads through river and stream banks.
- No visible erosion scars on embankments once construction is completed.

5.2 WATER RESOURCES

(Refer to Annex – Project Specific EMP Requirements)

5.2.1 Care must be taken to ensure that the pollution of water does not occur, as has been stated under previous points in this document.

5.2.2 Water must be used sparingly.

5.2.3 Naturally occurring water sources may not be used for any personal hygiene -, washing – or recreational activities.

5.2.4 Water may only be taken from private, communal, or government-owned property on a basis agreed upon between the Contractor and such owner.

5.2.5 Should the contractor be required to use water from a natural source, the contractor shall supply a method statement to that effect.

5.3 Fauna

(Refer to Annex – Project Specific EMP Requirements)

5.3.1 Construction activities must be carefully planned so as not to interfere with the breeding seasons of sensitive species.

5.3.2 Breeding sites of raptors and other wild birds must not be disturbed. Nests may not be removed or damaged.

5.3.3 Young chicks and eggs may not be removed from the nests.

5.3.4 Bird flappers and raptor perches should be added to the line structures at those locations specified in the specific conditions list (Normally includes areas near dams, river crossings, base of slopes and near cliffs).

5.3.5 No birds may be shot or caught.

5.3.6 All bird-power line interactions must be reported to the project manager, who will notify the SHE section.

5.3.7 Construction activities must be planned carefully so as not to interfere with the breeding, calving and lambing season for most animal species.

5.3.8 Termite mounds should only be disturbed if they pose a significant technical constraint. Only termite mounds inside the construction corridor should be demolished.

5.3.9 Care should be taken when demolishing the termite mounds, since many other animals, other than termites, live inside these mounds. Some of which can threaten the safety of people.

5.3.10 Underground burrows must not be flushed, closed up, or destroyed, on purpose, even if within the servitude area.

5.3.11 Snaring, poaching, killing, taunting, collecting, smuggling, or abuse of animal wild or domestic animal is prohibited.

5.3.12 No domestic animals (such as cows, chickens, dogs, cats, goats or sheep) may be kept either at the campsite on the construction site since they can introduce diseases or interbreed with the animals occurring naturally in the area.

5.3.13 No domestic or wild animals belonging to the landowner, may be caught and killed, unless written consent was given by the owner of the animal.

The following management objectives have been identified in terms of fauna:

- Minimise disruption to farming activities.
- Minimise disturbance of animals.
- Minimise disruption of breeding patterns.
- Minimise destruction of habitat.

Measurable targets:

- No stock losses where construction is under way.
- No complaints from landowners or nature conservation.
- No litigation concerning stock losses and animal deaths.
- Bird flappers installed where necessary.

5.4 FLORA

(Refer to Annex – Project Specific EMP Requirements)

5.4.1 Large trees outside the servitude may not be cut down.

5.4.2 Contractors must supply their workers with sufficient amounts of fire wood; no live natural vegetation may be used for fire wood.

5.4.3 Any plant material removed during bush clearing may not be used by the contractor as fire wood, unless this material was bought from the landowner.

5.4.4 The removal of any economically valuable trees or bushes shall be negotiated with the land-owner and written consent must be given for the action. The landowner is to be compensated for these trees.

5.4.5 The removal of culturally important trees should be carefully considered and when the removal is deemed necessary, compensation should be arranged.

5.4.6 Protected and endangered tree species occurring in the servitude must be identified and the necessary permits must be obtained, if they are to be harmed. These species must be identified before the start of the project.

5.4.7 All alien invasive plants and declared weeds that occur in the servitude should be identified and eradicated

The following management objectives have been identified in terms of flora:

- Minimal disturbance to vegetation, where such vegetation does not interfere with construction and operation of the line.
- Prevention of litigation concerning removal of vegetation.

Measurable targets:

- No litigation due to removal of vegetation.
- No unplanned or unnecessary removal of trees, especially economically valuable trees.
- No public complaints with respect to vegetation removal.

5.5 VELD FIRE PREVENTION

5.5.1 Fires are to be limited to the campsite only, as this will reduce the fire hazard. Any cases of veld fires caused during the construction period must be reported immediately. Damage caused by these fires will be remedied by the contractor.

5.5.2 If the need to make a fire on route (along the line, at any place except the campsite) arises, such a fire must be made inside a container or on the ground, inside a shallow hole, surrounded by rocks.

5.5.3 All fires must be extinguished when there is not someone supervising it and all ash must be cleaned up.

5.5.4 Fire fighting equipment must be kept in close proximity to the where work is taking place, at all times during construction.

The following management objectives have been identified in terms of veld fire prevention:

- Minimise risk of veld fires.
- Minimise damage to grazing.

Measurable targets:

- No veld fires started by the contractor's workforce.
- No claims from landowners for damage due to veld fires.

5.6 AESTHETIC QUALITY

5.6.1 Utmost care should be taken to limit the visual impact of the project on the environment.

5.6.2 High lying areas should be avoided for the erection of structures.

5.6.3 Construction activities, camp sites, service roads and waste sites, should not be located within 1 kilometre (minimum for hilly areas) of tourist lodgings or frequented tourist areas.

The following management objectives have been identified in terms of aesthetic quality:

- Minimise the visual impact of construction activities on the locality.

Management target:

- Reduced complaints from landowners and visitors to the area about visual disturbances caused by power-lines.

5.7 SOIL CONSERVATION

(Refer to Annex – Project Specific EMP Requirements)

5.7.1 Utmost care should be taken to prevent erosion. Guidelines for service roads should be followed carefully.

5.7.2 In mountainous / rough terrain, the contractor shall be responsible for any reasonable prevention of soil erosion should either the landowner or NamPower require it.

5.7.3 Erosion and drainage problems must be minimised by avoiding tracks crossing contours at right angles.

5.7.4 Measures must be put in place to avoid erosion at river and stream channel crossings, and at places where existing erosion scars and dongas are encountered to avoid any further erosion at these points.

5.7.5 Deep ruts and inaccessible sections must be repaired to avoid vehicles having to drive around bad sections (i.e. mud, deep ruts, and loose sand) thereby creating new tracks.

5.7.6 Vehicle tracks, particularly in areas of low rainfall, must be restricted to the width of the servitude or recognised access routes. All unnecessary tracks should be rehabilitated at the contractor's expense.

5.7.7 After construction in sandy areas, the entire width of the servitude should be levelled. Dicing is a suitable means of achieving this.

Levelling of the servitude width is required to ensure compaction by construction vehicle tracks is minimised as well as to reduce preferential flow paths during rainfall runoff.

5.7.8 Guidelines given previously in this document shall be closely followed to ensure that soil pollution does not occur.

5.7.9 Crossings of dongas and eroded areas shall be thoroughly planned. Water diversion berms shall be installed at donga crossings to ensure runoff water on the servitude does not run into dongas and cause an erosion hazard.

5.7.10 Disturbances of topsoil on tower sites with severe slopes shall be minimised at all costs. At any tower site, where conventional foundations are installed, the contractor shall remove the topsoil (the top 10 cm of soil) separately and store it for later used during rehabilitation of such tower sites.

5.7.11 The option of re-seeding should be investigated in disturbed areas

5.7.12 Slopes in excess of 2% must be contoured and slopes in excess of 12% must be terraced. Other methods of rehabilitation of tower sites may also be used. Contour banks shall be spaced according to the slope on tower sites.

The following management objectives have been identified in terms of soil management:

- Prevention of erosion.
- Scaring of the soil surface and land features must be minimised.
- The disturbance and loss of topsoil must be minimised.
- All disturbed areas along the servitude must be rehabilitated.
- Minimise erosion damage on donga crossings.
- Minimise impeding of natural water flow.
- Minimise initiation of erosion through donga embankments.
- Minimise damage to topsoil and the environment at tower positions.
- Successful rehabilitation of all damaged areas.

The following measurable targets are in place:

- Minimum loss of topsoil at any one site.
- No visible erosion scars three months after the completion of the project.

- No barren areas visible three months after the construction has taken place.
- All damaged areas successfully rehabilitated.
- No disturbance to donga embankments.
- No erosion visible on donga embankments due to construction activities.
- No interference with the natural flow of water.
- All disturbed areas successfully rehabilitated within three months of completion of the contract.
- All sandy areas levelled after construction.

6 MONITORING, AUDITING AND PROJECT HANDOVER

The standard site documentation shall be used to keep records on site. All documents shall be kept on site and be available for monitoring and auditing purposes. The documentation shall be signed by all parties to ensure that the documents are legal.

Monthly reports shall be forwarded to the NamPower project manager, with all the information relating to the SHE matters. The following key performance indicators must be reported on a monthly basis:

- Complaints received from landowners and the actions taken to address these complaints.
- Environmental and safety incidents, such as oil spills, concrete spills accidents and incidents and the actions taken.
- Incidents possibly leading to litigation.
- Environmental damage that needs rehabilitation measures to be taken.

The following documentation shall be kept on site:

- Access negotiations and physical access plan.
- Training materials/topics covered during induction.
- Signed attendance register during induction.
- Complaints register.
- Site daily diary.
- Records of all remediation and rehabilitation activities.
- Copies of the monthly reports.
- Copy of the EMP.

6.1 MONITORING AND AUDITS

6.1.1 A monitoring programme shall be put in place in order to ensure compliance to the EMP, but also to monitor environmental issues and impacts that have not been accounted for in the EMP, that are, or could, results in significant environmental impacts for which corrective actions are required.

6.1.2 The requirements for an audit shall be stipulated in the contract or work instruction. An audit shall be undertaken within the specified period, but must be undertaken before the contract is signed off. The audit shall be used to identify any non-conformances, for which corrective action is necessary. Corrective action shall take place before the contract is signed off.

6.1.3 The duration of the project should be taken into consideration when budgeting and planning for monitoring activities. Monitoring should be carried out every month.

6.1.4 Critical periods during which significant environmental impact could occur are to be identified, and the presence of the NamPower representative (who will co-ordinate with the ECO) during those periods to avoid unwanted impacts is essential.

6.1.5 An audit shall be undertaken during bush clearing (i.e. at the start of the work) as well as within a specified period after completion of the work but before the contract is signed off. The audit shall be used to identify non-conformance for which the Contractor shall take corrective action. The auditor may either be internal or external to NamPower.

6.1.6 The contractor shall arrange an inspection with the project manager, who will inform the ECO, for the final inspection of the

works. A first inspection will be done on which NamPower will draw up a snag list. Should the same items on the snag list still not be according to NamPower's satisfaction on the second inspection, all direct costs incurred for re-inspection will be on the contractor's account.

6.2 CLOSURE AND REHABILITATION

6.2.1 All rehabilitation exercises shall be carried out at the expense of the contractor, unless he can prove (beyond a doubt) that his actions were not responsible for the damage.

6.2.2 All oils spills still visible after construction activities have ceased shall be cleaned up.

6.2.3 All maintenance equipment, surplus materials and temporary structures, fences and works of any kind must be removed form the site.

6.2.4 Break up all bunds and all other concrete slabs and remove these, together with all waste concrete, to a recognised waste site.

6.2.5 Remove all uncontaminated construction rubble (i.e. waste concrete).

6.2.6 Remove all remaining waste to an established waste disposal site.

6.2.7 Damaged areas must be rehabilitated. Badly damaged areas shall be fenced to enhance rehabilitation.

7 REFERENCES

Parts of several existing NamPower documents have been assimilated into this one. They include:

- **Special conditions for the erection of Overhead Power Lines:**
  - Section 3 – Way leave rights
    - Entire section
  - Section 4 – General and Specific obligations of the contractor
    - Entire section

- **Specifications and General conditions for survey and route clearing for new power lines:**
    - Section 4 – Technical specification: Route clearing
        - Point 4.1, Point 4.3 with reference to table on page 2
    - Section 5 – Environmental specification: Route clearing
        - Entire section
    - Section 6 – Responsibilities of the surveyor
        - Point 6.2.3 – Point 6.2.4
    - Section 8 – Rights of way
        - Entire section
    - Section 10 – Behaviour towards property owners and the public
        - Entire section
    - Section 11 – General and specific obligations of the contractor
        - Entire section
    - Section 23 – Monitoring and audits
        - Entire section

Those sections assimilated from other documents into this one, can thus be removed from their parent documents, once this GEMP is approved.

This GEMP also refers to NamPower's policy on hydro-carbon spillage clean-up (HR Standard Operating Procedure No 33 – Revision no 1/12/2003).

This document was compiled using NamPower documents for the greatest part of it; however, the ESKOM generic EMP was also consulted, just to make sure that nothing was missed.

8 APPENDICES

8.1 SPECIAL CONDITIONS FOR PROJECT

The following information must be stated in the special conditions of each project (blank spaces to be filled in upon issuing of tender/contract):

Servitude width

The building restriction is _____ m. Construction is limited to the _____ m servitude in which the line will be constructed. A 6m strip shall be cleared, flush with the ground, to facilitate access and construction except where tower erection and stringing requires more space. Any extra space outside the servitude shall be negotiated with the relevant landowner and approved by NamPower. All areas marked as no go areas inside the servitude shall be treated with the utmost care and responsibility.

The special conditions should also, if possible, include an accurate summary of the climate of the area for the entire period of work.

This summary should include:

- Average rainfall per month for the entire planned duration of the project.
- Type of rain normally experienced (light drizzle, heavy thunderstorms).
- Prevailing wind direction.
- Average wind speed.
- Average day and night temperature.

Apart from an accurate climate summary, any other special conditions must be included in this appendix, which will make the EMP more project specific.

8.2 PHOTO PLATE OF IMPORTANT SPECIES

The photo plate must include photos, along with scientific and common names of all important plant, bird, and animal species.

This list must include all:

- Rare and endangered species that occur in the area.

- Species protected by national legislation.
- Large bird species that can pose a problem in terms of power line collisions.
- Species that are responsible for bush encroachment.
- Alien invasive species.
- All plant species that are poisonous to humans.
- All animal species that are dangerous to humans.




RELOCATION AND COMPENSATION PLAN:

Sections 3 and 4:

Omatando to Oshivelo

September 2014

REPUBLIC OF NAMIBIA

NamPower

Prepared by: Ernst Simon

URBAN DYNAMICS
TOWN & REGIONAL PLANNERS

400KV Transmission Line from the Omatando Substation to Oshivelo

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ATTACHMENTS

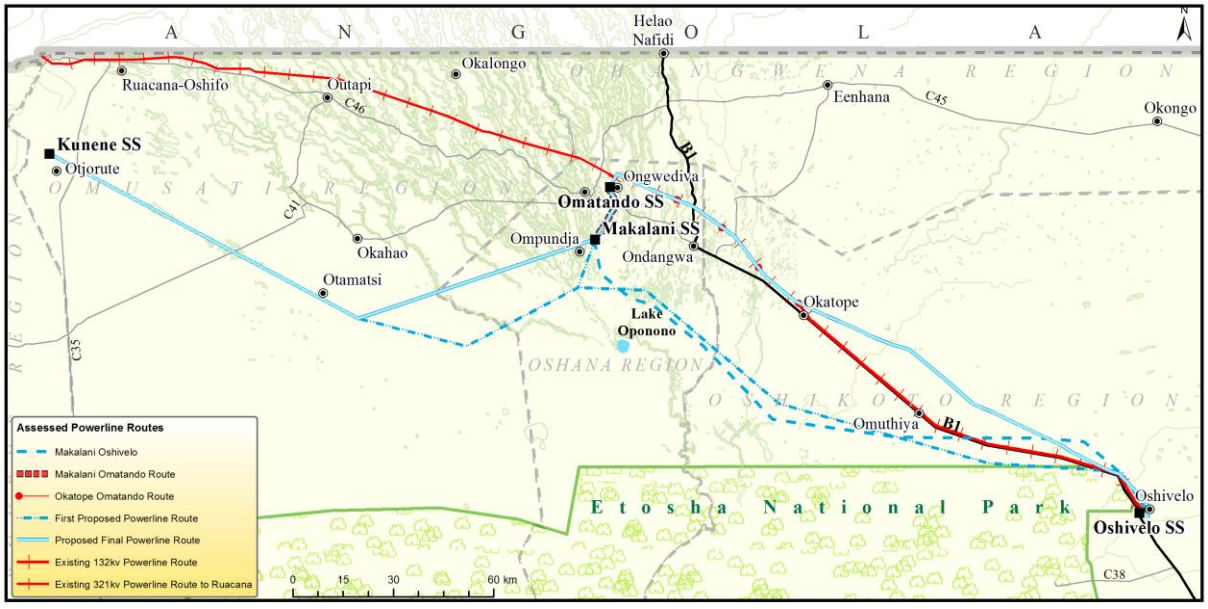
Compact Disk containing the detail of each household or homestead that were investigated during the fieldwork, a photo record of each homestead and affected trees and the calculations of the cost of compensation based on the Cabinet Policy.

1 INTRODUCTION

1.1 PROJECT DESCRIPTION

Tin order to make provision for the growing demand for electricity in the North of Namibia, and to strengthen the northern "backbone" of NamPower's transmission grid, NamPower intends to construct a new 400 kV transmission line from the proposed new Kunene substation about 30km south of Ruacana to the Omatando substation which is located just to the north of the town of Ongwediva. As a second phase, the line will also be extended from the Omatando substation to Oshivelo, which is the focus of this report. The total length of the line will be about 380km. The proposed route for the 400kV transmission line is provided in figure 1 below. This report, however, will focus on Section 3, which runs from the Omatando substation next to an existing 132kV line to a point close to the Okatope substation, and Section 4, which follows a new alignment from Okatope to Oshivelo.

Figure 1: The Proposed Power Line



Section 3 will run through a densely populated area from the Omatando substation next to an existing 132kV line to a point close to the Okatope substation and as such monopole structures will be used. As **Section 4** follows a new alignment from Okatope to Oshivelo, v type towers will be used.

Within the servitudes, a 12 m wide strip will need to be completely cleared of vegetation and obstacles to create a service road for access to the line during construction and maintenance, as well as throughout the lifespan of the line.

With the need to route the transmission line as straight as possible, it is unavoidable that homesteads and other infrastructure will be in the way and it will be necessary to relocate some of the homesteads where no other avoidance or mitigation efforts are possible. Consequently, this report aims to describe the relocation and compensation activities required for the project. This is done in the form of a Relocation and Compensation Action Plan (RECAP).

1.2 PROJECT COMPONENTS REQUIRING LAND AQUISITION

The only land acquisition that will take place as a result of the project is the footings of the poles and the need to not have homesteads too close to the line. This is even flexible and it may be allowed that parts of homesteads extend into the 50m wide servitude of the transmission line. The only problematic situation which requires relocation is when a homestead is directly under or within a 20 m area to each side of the conductors or so close to a pole that a falling pole could reach the homestead. Construction of a power line requires that the vegetation around the line is reasonably cleared so as not to interfere with the conductors during operation and to allow for the stringing of the conductors during construction. This requires that large trees that may be in the way of the line be cleared.

This transmission line is routed through 4 sections of varying degrees of settlement density. In the more densely populated communal farming areas, smallholders plant dry land crops in fields which are about 2 – 3 ha in size. Homesteads are normally built in the fields as are other farm infrastructure such as kraals and harvest floors. There are many common fruit trees, such as Paw Paws and citrus trees, as well as large fruit trees such as Marula, Omwandi, Omuve and Makalani Palms covering the area and these trees can be especially large where they occur inside the crop fields. Trees are used for its fruit and for making traditional alcoholic drinks and non-alcoholic juice.

1.3 ESTIMATES OF LAND AQUISITION AND RESETTLEMENT

Following the final alignment of the line from Omatando to Oshivelo, there is a total of 43 households that needs to be relocated while there are 165 private fruit bearing trees that will need to be cut down to make way for the line. Trees within the commons are not included since these are not required to be compensated for. A summary of assets that will be affected by the project is listed in the table below.

Table 1: Summary of Affected Assets

Asset	Section 3	Section 4	Total
Total Fields crossed	162	92	*254*
Households relocated	35	8	*43*
Structures relocated	318	53	*371*
Fences	35	8	*50*
Trees removed	165	0	*165*

2 EVALUATING RESETTLEMENT

In order to capture the first alignment of the line, NamPower used a 1:250 000 scale topographical map. This information was then transferred to aerial photography derived from the 2010 census photography and the 2007 aerial photography procured from the Ministry of Lands. Utilising this base map, the alignment of the line was then flown by helicopter to assess whether it was possible to route the line through the densely populated areas surrounding the main urban areas in the Omusati, Oshana and Oshikoto Regions. The initial alignment followed a route to the south of the densely populated areas, of the Omusati Region but then followed a north easterly and northerly direction in between Oshakati and Ongwediva to the Omatando Substation. From the Omatando substation, the idea was to then double back along the same route to the Makalani Substation site and then continue, again to the south of the high density areas and north of Lake Oponono to Oshivelo. However, the inputs of other specialists recognized that the area traversed by the southern route would have a severe impact on vulnerable migrating birds. It was decided to find an alternative route to the north of the existing Omatando – Okatope – Oshivelo 132kV line. Following another helicopter reconnaissance trip, the preferred route was defined and set for assessment.

In order for the team to explain the project to local and regional stakeholders, public meetings for Sections 3 and 4 were held in Onyaanya (12 March 2014) and Omuthiya (12 March 2014)) for which the Regional Councils, line ministries, traditional

authorities, headmasters of various schools and the general public were invited. Issues raised by stakeholders were recorded and included as key issues to be assessed during the social impact assessment, along with key issues identified from a comprehensive literature study.

It was recommended by the stakeholders during the first round of public meetings that separate meetings should be arranged through the regional councils to involve more councillors and, especially, traditional leaders prior to commencing with fieldwork. This was arranged, councillors and traditional leaders were briefed and the fieldwork was done from 19 May 2014 to 13 June 2014.

The sociologist drove the route of the line and recorded all homesteads, other assets and fruit trees that will be affected by the line, which were then recorded in terms of its position, ownership, species and a photograph was taken of each structure to help with determining the compensation amounts for each homestead. In total, 151 conflict points were visited in Section 3 and 131 in Section 4. The opportunity was also used to further fine tune the alignment and a few changes were made which helped to avoid some more trees as a mitigation measure. Thereafter, the information collected was mapped and the Social Impact Assessment Report and the Relocation and Compensation Action Plan developed.

The sequencing of the task and flexibility of the client allowed for a methodology where avoidance measures could be implemented through the iterative alignment of the transmission line as a first step.

This methodology allowed the team to influence the project design in such a way that much of the main impacts as identified by the local communities could be avoided through the re-alignment.

- The final alignment will result in the relocation of 43 homesteads while 165 trees will need to be removed. The line substantially cuts through 254 cultivated fields along the route.

This methodology resulted in the satisfactory avoidance of impacts on many houses and trees while the remaining impacts were then assessed and mitigation measures designed to minimise negative and optimise positive impacts.

3 SURVEYS AND ASSET INVENTORIES

During the field work, it was found that the line crosses 254 fields, although not all the corresponding homesteads were impacted. A total of 43 homesteads were identified as casualties and must be relocated and compensated. In terms of the

fruit bearing trees that will be affected by the line, it was found that 165 fruit bearing trees will need to be cut down. All these trees are in the fields. There are more trees in communal land areas outside of the ownership of any specific person. A full inventory, including photographs, of the trees per homestead for each section is included in the attached CD.

These findings have not yet been presented to the local community but it will be presented to them in a public meeting to be arranged prior to the commencement of construction. The information collected is regarded as accurate since it is based on on-site verifications done during the final alignment of the line.

It is not anticipated that any additional information will be required for the process of monitoring. Adequate data is available for the monitoring of the relocation and compensation needs of the project and to make sure that resident interests are duly considered during the construction process.

4 LEGAL FRAMEWORK

Besides the Environmental Legislation which guides this assessment, the only additional regulations pertaining to the social environment of the project relates to the issue of compensation. **The Government of the Republic of Namibia in April 2008 adopted a revised Compensation Policy and Guidelines for communal land areas in Namibia.**

The purpose of the policy and guidelines is to explain the instances where land is needed for public sector projects, to give direction on how to determine compensation for such land needed or other resources that may be affected, and to help owners to choose a compensation option in certain cases.

This revised policy and guidelines argues that the previous compensation policy was not fair and just in terms of the actual values of compensation paid to communal farmers where their land were required for infrastructure projects. It states that the fundamental principle of compensation is to put the claimant in as near as possible to the same position as he or she was before the acquisition or displacement.

In terms of the principles normally used to calculate the amount of compensation, the Policy pertinently states that such calculations shall not use the element of depreciation for determining the amount of compensation for homesteads, fences and other agricultural assets.

It clearly defines the rights related to the use of communal lands and typifies it as a usufruct held by the person who currently administers the land for his own benefit and this right remains valid until the death of that person.

With reference to the nature of this project, the policy spells out the compensation amounts that must be paid to communal land holders should they be required to relocate their fields, homesteads and other agricultural infrastructure. It further rules that compensation must be paid to land holders for the loss of fruit trees and a detailed basis for the calculation of compensation is provided. It also provides for a disturbance allowance.

Of importance also is that Cabinet specifically approved that negotiation and consultation with the affected families or land occupants be the primary guideline in the process of determining the compensation amount.

More specifically and related to this project, the following compensation guidelines were approved and will be used for the calculation of compensation. (Refer to Tables 2 and 3)

Table 2: Compensation Amounts related to Structures.

Structure	Proposed rate (N$)
Homestead enclosure from corrugated iron	N$77/m (estimated rates)
Homestead enclosure with strand wire, poles and droppers	N$105/m
Homestead enclosed with wooden poles only	N$90.00/m
Homestead enclosure from brick	N$200/m (estimated rates)
Huts with pole walls, grass roof and earth floor	N$150.00/m²
Huts with mud brick walls, grass roof and earth floor	N$225.00/m²
Huts with cement brick walls, grass roof and earth floor	N$260.00/m²
Huts with cement brick walls, grass roof and concrete floor	N$300.00/m²
Corrugated Structures	N$75.00/m²
Conventional building (brick wall, IBR roofing, concrete floor)	N$3000/m² Depending on the quality of finishes condition and workmanship of the building structures as determined by a Government Valuer
Cattle Kraals, goat pens, pig pens made of with strands, poles with or without droppers	N$105/m
Cattle kraals, goat pens, pig pens made of wooden poles only	N$90.00/m
Enclosure fencing of the entire property	N$75.00/m
Well (located in soft soils)	N$20/m
Well (located in hard soils)	N$50/m
Other structures, boreholes, water tanks, etc.	Amount payable to be assessed and determined by a Government Valuer.

Table 3: Compensation Amounts related to Fruit-Bearing trees.

Local/ common name	Scientific/ botanical name	Estimated fruits per season per tree	Estimated quantity sold		N$/fruit or per litre of a drink	Total price per season (N$)	Estimate maturity period in years	Tree value at maturity (N$)	Main product
			KG	Litre					
Mango	Mangifera Indica	150			5	750	5	3750	fruit
Lemon		180			4	720	5	3600	fruit
Omukuyu /fig tree	Ficus Sycomorous			25	10	250	10	2500	Liquor/ ombike
Orange		180			6	1080	5	5400	fruit
Marula	Sclerocarya Birrea		300	150	10	1,500	10	15000	Wine (omongo)
Omwandi	Diospyros Mespiliformis		80	25	60	1,500	10	15000	Liquor/ ombike
Omulunga	Hyphaene Petersiana			25	60	1,500	10	15000	Liquor/ ombike fruit
Guava	Psidium Guajava	200			1	200	5	1000	fruit
Omuve	Berchemia discolor			30	60	1,800		12600	fruit
Paw paw	Carica papaya	20			10	200	5	1000	fruit
Grape	Vitis vinifera		40			N$304	3	912	Wine/ Fruit drink
Banana	Musa acuminate	40kg	40		8.50	N$340	3	1020	fruit
Peach	Prunus persica					N$344	5	1,720	fruit
Other fruit trees							Amount payable to be assessed at the time of determination		

The method of valuation used to determine the values of the various types of assets that will be affected by the project is clearly spelled out in the Compensation Policy. According to this, the valuation methodology is based on the realisation that the depreciation cost approach to value assets for the purpose of determining

compensation is flawed if it is the intention to ensure that those that are affected will be at least the same or better-off after the project than before. This is especially true in the communal land areas where traditional building materials are becoming scarce and where environmental legislation prevents the cutting of trees for building material without the required permits. Therefore, using the depreciation cost approach would put people who lose assets as a result of public projects at a disadvantage and it may not be possible for them to replace their current assets if compensation is calculated using the depreciation cost approach. The policy therefore states that, in valuing traditional building structures on communal land, the prevailing replacement value of new materials shall be used. It is also ruled that the amounts contained in the Policy be adjusted from time to time by the government valuer to provide for inflation. The compensation amounts for buildings, homesteads, fences and other agricultural assets have therefore been based on this valuation principle.

The valuation of trees of various species is based on the estimated number of fruit borne by each species per season, the estimated quantities of fruits or litres that can be sold from such a tree, the income that can be expected per season as well as the age of each tree. This methodology provides a good indication of the income or amenity that will be lost if the tree is lost and considers the period it will take to grow another tree to the point where it will produce the same as the lost tree. The local compensation policy is regarded as adequate for this project relative to the assessed impacts it will have on the local population.

5 RESETTLEMENT SITES

For the purpose of this assessment it is assumed that once the transmission line has been constructed, farmers will be allowed to cultivate the entire field including the portions that are directly under the cables and around the poles. It has further been assumed that the 50 and 80m servitudes will not be strictly enforced and that in a few cases where homesteads are slightly closer than the 20m from the centre of the line, these will be allowed to remain where they are.

A total of 43 homesteads will need to be relocated in Sections 3 and 4. Aerial photographs of the homesteads, including the structures, fences and trees that will be removed, are provided on the Compact Disk attached to this report.

6 INCOME RESTORATION

One type of income that will be lost as a result of the project is the income potential derived from the fruit of the fruit bearing trees. This potential income will be restored through the payment of cash compensation for all the trees that will be lost where they belong to a specific owner. Another type of potential loss of income will occur when construction takes place while there is still a harvest on the field. Since the construction of the line will take place during a period when the fields are cultivated, it is highly probable that crops will be affected by the construction of the line. This potential loss of income will be restored through the payment of crop losses at a rate/ha for the area of a field that is required for the construction work.

7 INSTITUTIONAL ARRANGEMENTS

The disbursement of compensation and arrangements regarding the relocation timing and compensation will be done by NamPower through its normal systems. However, when detail about compensation and negotiations take place, the official responsible will arrange with the regional councilor of the constituency traversed by the line or his nominee to accompany him to the affected households, sit in on the discussions and witness the agreement and compensation payments made. The regional councilor must also invite the senior headman of the area concerned to attend the discussions. The first contact in the Oshana Region is to be made through the Office of the governors of the Oshana Region (Hon. Clemens Kashipulwa and for the Oshikoto Region, (Hon. Penda Ya Ndakolo) This will ensure that all key officials are aware of the process and have been informed about it.

8 PARTICIPATION AND CONSULTATION

However, prior to any compensation negotiations and actions taking place, the consultant team will have a public feedback meeting during which the findings of the EIA will be shared with local stakeholders, the entitlement matrix will be discussed, stakeholders will be informed of the compensation process, the role of the regional councilors and traditional leaders in the compensation process will be cemented and a grievance procedure will be agreed upon.

9 GRIEVANCE REDRESS

The proponent and the ESIA team will set up a grievance committee which will deal with all grievances received from any stakeholder. The grievance committee will consist of one representative each from Nampower and the concerned Regional Council and three representatives from the local community. There will therefore be two separate grievance committees, one for each region. The proponent will also appoint the site representative as grievance officer who will be responsible for receiving all grievances and for instituting the necessary action to deal with them. The committee will be obliged to meet when there are complaints and to deal with these swiftly and effectively. Stakeholders will always be given the benefit of the doubt when considering complaints and the grievance officer will institute all reasonable actions required to remedy the situation should the complaint be fair and valid.

The grievance officer will also act as the secretary to the Grievance Committee. A pro-forma grievance recording form, grievance redress monitoring form and record of actions form is attached to this plan as **Appendix 1**. This form must be made available to members of the grievance committee and will also be brought under the attention of all stakeholders. Such forms will also be provided to the local leadership for use if and when necessary.

Should a grievance arise, the following procedure will be followed:

Any grievance will first be addressed to the grievance officer who will record the grievance on the prescribed grievance forms and prepare a report on the grievance. Within 2 days after receipt of a grievance, the grievance officer shall forward the grievance form to the project manager. The project manager will then evaluate the grievance and take the necessary action to redress the grievance immediately, if possible. If this is not possible, the project manager will, within 4 days after having received the grievance from the grievance officer, call a meeting of the grievance committee to consider the grievance and take a decision about it within one week after having been convened by the project manager. Following the decision of the grievance committee, the grievance officer shall complete the grievance redress monitoring form and the record of actions taken by the receiving officer, project manager and grievance committee. S/He shall provide feedback to the aggrieved party as to the decision of the grievance committee, the actions to be taken and the person responsible for the action.

The completed forms shall be forwarded to the Safety, Health and Environment Section of NamPower, which will be responsible for monitoring the implementation

phase of the project, for verifying that the proposed actions were indeed taken and that the grievance was resolved satisfactorily.

10 MONITORING AND EVALUATION

The monitoring of the implementation of the relocation and compensation process will be carried out by staff of the Environmental Section and project manager of NamPower according to normal audit protocols. The site representative will also function as the grievance officer and monitoring and evaluation will be done in accordance with the provisions of the Environmental Management Plan.

11 COSTS AND BUDGETS

The table below provides the cost of compensation and therefore also the budget that needs to be provided for the actual cash payouts. It excludes disbursement and travelling cost for the actual implementation of the relocation and compensation activities.

Table 4: Compensation Budget

Asset	Section 3	Section 4	Total
Structures to be relocated	$9,959,775.00	$75,750.00	***$10,035,525.00***
Fences to be replaced	$496,740.00	$141,360.00	***$638,100.00***
Trees to be removed	$1,834,450.00	$0.00	***$1,834,450.00***
Cost per Section	***$12,290,965.00***	***$207,110.00***	***$12,498,075.00***
Disturbance Allowance	$1,014,147.05	$32,566.50	***$1,046,713.55***
Cost plus disturbance	***$13,305,112.05***	***$239,676.50***	***$13,544,788.55***
Contingency of 15%	$1,995,766.81	$35,951.48	***$2,031,718.29***
Total Cost per Section	***$15,300,878.86***	***$275,627.98***	***$15,576,506.84***

By means of summary, the total compensation to be paid for relocation of all the homesteads, which includes both their structures and fences, in sections 3 and 4 amounts to a total of N$ 10,673,625.00, while the total compensation for the trees that need to be removed amounts to N$ *1,834,450.00*.

A disturbance allowance was further allocated to each household, depending on the amount owed. The compensation guidelines for the disturbance allowance were calculated as follows:

i) A total compensation of 15% if the total compensation amount payable does not exceed N$ 100 000; PLUS

ii) Five percent of the amount by which it exceeds N$ 100 000, if it does not exceed N$ 500 000; PLUS

iii) Three percent of the amount by which it exceeds N$ 500 00, if it does not exceed N$ 1 000 000; PLUS

iv) One percent (but not amounting to more than N$ 15 000) of the amount by which it exceeds N$ 1 000 000.

A total disturbance allowance for Sections 3 and 4 was calculated at N$ 1,046,713.55.

For the sake of safety a further contingency of 15% or N$2,031,718.29 is also allowed for, which brings the total amount needed for compensation to N$ $15,576,506.84 for Sections 3 and 4.

To assist with the execution of the compensation, a CD, which includes an excel sheet of the compensation calculations of the affected households for each section ("Compensation Calculations") as well as a document per section of the data captured of the affected homesteads have been attached to this report. Each homestead is also clearly shown on a map to illustrate the alignment relative to other features and identifies all the structures and trees that need to be removed. These documents follow the line from Omatando to Oshivelo and were designed as an aid to the Environmental section of NamPower and the person responsible for compensation to identify the specific assets and find it easily in the field.

12 CONCLUSION

The construction of the proposed 400kV transmission line from the Omatando substation to the Oshivelo substation will require 43 homesteads to be relocated within its existing fields and will require 165 individually owned fruit bearing trees to be removed. To mitigate this impact, an amount of N$ $15,576,506.84 is required to compensate the affected home owners.

The line will traverse about 254 fields and it is recommended that this is not compensated because owners will be allowed to use the land below the line after

construction. However, if crops are destroyed during construction, this must be compensated at a rate equal to the value of the harvest per hectare during that specific season.

The grievance procedure is spelled out and must be implemented from the onset of the project.

Appendix 2 provides the detail of the households that must be compensated and must be used as the basis of negotiation with individual households.

13 REFERENCES

Compensation Policy Guidelines for Communal Lands [Report] / auth. Government of the Republic of Namibia. - Windhoek : GoN, 2008.

Handbook for Preparing a Resettlement Action Plan [Report] / auth. International Finance Corporation. - Washington, DC : IFC, 2002.

Operational Directive OD 4.30 on Involuntary Resttlement [Report] / auth. World Bank. - Washington DC : World Bank, 1990.

APPENDIX 1: GRIEVANCE REDRESS FORMS

NEW KUNENE TO OSHIVELO 400 kV TRANSMISSION LINE:

FORM 1: GRIEVANCE RECORDING FORM			
Name of Aggrieved person			
Sex	Male		Female
Address			
Phone Number			
Traditional Leader through whom grievance is submitted (Name)			
Subject of Grievance			
Description of Grievance (add additional pages if necessary			
Official who received grievance			

NEW KUNENE TO OSHIVELO 400 kV TRANSMISSION LINE:

This form is to be completed by the grievance officer upon receipt of a grievance from any party.

FORM 2: GRIEVANCE REDRESS MONITORING FORM				
Date of Receipt		dd	mm	yyyy
Mode of receiving Grievance	Letter/ complaint form	Phone call	fax	Verbal complaint
Type of problem / grievance	Land /fields Impact			
	Trees			
	Fences			
	Construction activities			
	Resettlement			
	Other (Specify			
Short description of the problem				
Short description of the factors causing the problem				
Date referred to project manager				
Problem solved by PM?			Yes	No
Problem referred to Grievance committee?			Yes	No
Problem solved by grievance committee			Yes	No
Feedback provided to complainant?			Yes	No
Grievance regarded as resolved?			Yes	No
Signed off:	Name signature		date	

FORM 3: RECORD OF ACTIONS TAKEN BY THE RECEIVING OFFICER, PROJECT MANAGER AND GRIEVANCE COMMITTEE			
Action 1	**Action 2**	**Action 3**	**Action 4**
Short Description	**Short Description**	**Short Description**	**Short Description**
Name of action officer	**Name of action officer**	**Name of action officer**	**Name of action officer**
Office	**Office**	**Office**	**Office**
Date	**Date**	**Date**	**Date**
Final Resolution			

Name of person completing the form: _____

Signature: _____**Date:** _____

APPENDIX 2: SECTIONS 1 AND 2 SUMMARY OF COMPENSATION

SECTION 3								
Household	*Owner*	*Number*			*Compensation Owed*	*Disturbance*	*Contingency*	*Total*
2HH04	Hilima Vilipata	Not listed	18° 2'28.24"S	16°13'37.93"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH05	Ester Nukongo	0811401151	18° 2'18.53"S	16°13'26.79"E	$60,000.00	$9,000.00	$10,350.00	$79,350.00
2HH06	Josophina Akwaake	0814032614	18° 2'6.39"S	16°13'1.12"E	$45,000.00	$6,750.00	$7,762.50	$59,512.50
2HH07	Elizabeth Lumbu	0814490139	18° 1'49.73"S	16°12'42.48"E	$22,500.00	$3,375.00	$3,881.25	$29,756.25
2HH09	Hileni Mwandingo	0813387646	18° 1'37.61"S	16°12'35.50"E	$49,500.00	$7,425.00	$8,538.75	$65,463.75
2HH10	Marial Kanyemba	Not listed	18° 1'28.47"S	16°12'18.66"E	$27,000.00	$4,050.00	$4,657.50	$35,707.50
2HH11 (a)	Lahiya Nugulu	0813507883	18° 1'8.76"S	16°11'52.71"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH11 (b)	Naemi Petrus	0813587672	18° 1'8.76"S	16°11'52.71"E	$49,500.00	$7,425.00	$8,538.75	$65,463.75
2HH12	Hilma Alweedo	0813052672	18° 0'23.79"S	16°10'53.46"E	$7,500.00	$1,125.00	$1,293.75	$9,918.75
2HH14	Methews Itona	081327361	17°59'56.29"S	16°10'33.08"E	$109,455.00	$15,472.75	$18,739.16	$143,666.91
2HH20	Kapita IddaLiina	Not listed	17°57'43.36"S	16° 8'27.94"E	$22,540.00	$3,381.00	$3,888.15	$29,809.15
2HH21	Festus Tobias	0812792526	17°57'12.64"S	16° 8'5.16"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH22	Maria Mbango	0812299354	17°57'4.72"S	16° 7'59.22"E	$732,040.00	$43,961.20	$116,400.18	$892,401.38
2HH24	Tsilongo Johnes	0813429431	17°56'45.86"S	16° 7'44.50"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH28	Saimi Eino	Not listed	17°55'50.71"S	16° 7'2.75"E	$239,925.00	$21,996.25	$39,288.19	$301,209.44
2HH32	Emilia Petrus	0816081137/081405292	17°55'20.24"S	16° 6'40.76"E	$75,000.00	$11,250.00	$12,937.50	$99,187.50
2HH35	Maria Gabriel	0816132625	17°54'51.88"S	16° 6'17.04"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH39	Not listed	Not listed	17°54'9.35"S	16° 5'45.94"E	$343,275.00	$27,163.75	$55,565.81	$426,004.56
2HH41	Elifas Nuuyuni	0812892350	17°53'56.99"S	16° 5'36.94"E	$639,190.00	$41,175.70	$102,054.86	$782,420.56
2HH45	Johnna Pohamba	Not listed	17°53'14.56"S	16° 5'3.73"E	$482,630.00	$34,131.50	$77,514.23	$594,275.73
2HH47	Nangolo Jekonia	0811285919	17°53'4.04"S	16° 4'56.58"E	$1,058,900.00	$53,767.00	$166,900.05	$1,279,567.05

2HH48	Not listed	Not listed	17°52'51.98"S	16° 4'47.87"E	$27,600.00	$4,140.00	$4,761.00	$36,501.00
2HH52	Kistoph Sema	0813195826	17°52'25.20"S	16° 4'4.41"E	$42,600.00	$6,390.00	$7,348.50	$56,338.50
2HH53	Maria Kapenda	0816852736	17°52'19.52"S	16° 3'55.73"E	$40,200.00	$6,030.00	$6,934.50	$53,164.50
2HH54	Petrus Sakarian	0813972687	17°51'56.92"S	16° 3'28.42"E	$884,595.00	$48,537.85	$139,969.93	$1,073,102.78
2HH56	Titus Joseph	Not listed	17°51'48.91"S	16° 3'19.10"E	$247,725.00	$22,386.25	$40,516.69	$310,627.94
2HH57	Maria Shigwetha	Not listed	17°51'46.67"S	16° 3'15.12"E	$300,000.00	$25,000.00	$48,750.00	$373,750.00
2HH58	Not listed	Not listed	17°51'43.55"S	16° 3'9.50"E	$333,300.00	$26,665.00	$53,994.75	$413,959.75
2HH59	Anna Ehaseus	0812264888	17°51'39.99"S	16° 3'0.21"E	$27,600.00	$4,140.00	$4,761.00	$36,501.00
2HH62	Aina Stephanus	0816798005	17°51'17.44"S	16° 2'36.98"E	$75,000.00	$11,250.00	$12,937.50	$99,187.50
2HH65	Toin Iipinge	0812003680	17°50'41.77"S	16° 1'51.69"E	$45,000.00	$6,750.00	$7,762.50	$59,512.50
2HH66	Josef Shimpulu	0812992761	17°50'7.11"S	16° 0'55.53"E	$80,805.00	$12,120.75	$13,938.86	$106,864.61
2HH67	Amunwe Ndatega	0814515218/08125900476	17°50'1.39"S	16° 0'45.94"E	$12,600.00	$1,890.00	$2,173.50	$16,663.50
2HH69	Petrus Iimbili	Not listed	17°49'40.57"S	16° 0'25.70"E	$12,600.00	$1,890.00	$2,173.50	$16,663.50
2HH74	Daniel Johnnes	0812203264	17°49'9.90"S	15°59'38.02"E	$288,780.00	$24,439.00	$46,982.85	$360,201.85
2HH75	Tiophews Jekonia	0814902394	17°49'3.31"S	15°59'19.25"E	$72,600.00	$10,890.00	$12,523.50	$96,013.50
2HH76	Bertha Mathews	0812005325	17°48'56.30"S	15°59'8.86"E	$30,000.00	$4,500.00	$5,175.00	$39,675.00
2HH81	Estel Angula	Not listed	17°48'23.65"S	15°58'33.85"E	$67,630.00	$10,144.50	$11,666.18	$89,440.68
2HH82	Salom Iladhenga	0812350785	17°48'12.88"S	15°58'26.07"E	$27,600.00	$4,140.00	$4,761.00	$36,501.00
2HH83	Timotheus Petrus	0813045963	17°48'7.00"S	15°58'8.57"E	$295,835.00	$24,791.75	$48,094.01	$368,720.76
2HH84 (a)	Andreas Shipanga Shikongo	0812092194	17°48'1.63"S	15°58'0.22"E	$414,005.00	$30,700.25	$66,705.79	$511,411.04
2HH84 (b)	Natamdel Johannes	0813086409	17°48'1.63"S	15°58'0.22"E	$43,575.00	$6,536.25	$7,516.69	$57,627.94
2HH87	Barkias Lazarus	0812876237	17°47'47.76"S	15°57'21.69"E	$11,700.00	$1,755.00	$2,018.25	$15,473.25
2HH88	Werner Johannes	0814366939	17°47'44.45"S	15°57'17.52"E	$161,065.00	$18,053.25	$26,867.74	$205,985.99
2HH89	Festus Tobias	0813729431	17°47'40.76"S	15°57'11.83"E	$30,000.00	$4,500.00	$5,175.00	$39,675.00
2hh91	Maria Alpeus	0814527448	17°47'32.45"S	15°56'45.75"E	$366,625.00	$28,331.25	$59,243.44	$454,199.69
2HH96	Mikanor Kanyama	Not listed	17°47'7.45"S	15°55'43.84"E	$9,810.00	$1,471.50	$1,692.23	$12,973.73
2HH97	Paulus Nuulonya	Not listed	17°47'4.41"S	15°55'32.62"E	$52,800.00	$7,920.00	$9,108.00	$69,828.00
2HH99	Abner Kwedhi	0812788317	17°46'55.30"S	15°55'23.18"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH100	Petrina Juuso	0814156833	17°46'52.41"S	15°55'8.70"E	$19,050.00	$2,857.50	$3,286.13	$25,193.63

2HH104	Asser Petrus Shimpanda	0812035431	17°46'42.65"S	15°54'39.68"E	$291,930.00	$24,596.50	$47,478.98	$364,005.48
2HH106	Aina Fanuela	081837386	17°46'29.11"S	15°54'15.64"E	$65,400.00	$9,810.00	$11,281.50	$86,491.50
2HH108	Not listed	Not listed	17°46'23.15"S	15°54'0.60"E	$42,600.00	$6,390.00	$7,348.50	$56,338.50
2HH110	Not listed	Not listed	17°46'18.63"S	15°53'41.39"E	$70,200.00	$10,530.00	$12,109.50	$92,839.50
2HH113	John Ingashipola	0814134803	17°46'10.55"S	15°53'20.70"E	$12,600.00	$1,890.00	$2,173.50	$16,663.50
2HH115	Paulina Nakale	0813170880	17°46'3.53"S	15°53'1.51"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH118	Kandiingoma	Not listed	17°45'53.20"S	15°52'37.67"E	$7,200.00	$1,080.00	$1,242.00	$9,522.00
2HH120	Letisia Nelenge	0814939154	17°45'47.65"S	15°52'31.18"E	$74,285.00	$11,142.75	$12,814.16	$98,241.91
2HH121	Johannes Itoolna	0812621888	17°45'41.00"S	15°52'25.55"E	$60,000.00	$9,000.00	$10,350.00	$79,350.00
2HH122	Wilhelm	Not listed	17°45'39.89"S	15°52'0.44"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH123	Therese Hanahome	Not listed	17°45'31.03"S	15°51'54.82"E	$25,200.00	$3,780.00	$4,347.00	$33,327.00
2HH124	Anna Gabriel	0814724176	17°45'25.22"S	15°51'43.27"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH125	Israel Nahandi	0812895782	17°45'25.09"S	15°51'35.63"E	$850,655.00	$47,519.65	$134,726.20	$1,032,900.85
2HH128	Esther Johannes	0813470655	17°45'11.52"S	15°51'8.18"E	$42,600.00	$6,390.00	$7,348.50	$56,338.50
2HH129	Barthlomeus Hamukoto	0818603779 / 0811272603	17°45'6.54"S	15°50'58.49"E	$850,005.00	$47,500.15	$134,625.77	$1,032,130.92
2HH130	Kleopas Ndawanlifna	0813782921	17°45'3.80"S	15°50'49.97"E	$13,125.00	$1,968.75	$2,264.06	$17,357.81
2HH132	Lavinia Mandume	0818076781	17°44'51.94"S	15°50'27.28"E	$30,000.00	$4,500.00	$5,175.00	$39,675.00
2HH134	Peneyambeko Janus	0818472559	17°44'44.23"S	15°50'6.97"E	$23,445.00	$3,516.75	$4,044.26	$31,006.01
2HH136	Immanuel Jason	0813857818	17°44'35.22"S	15°49'46.66"E	$164,550.00	$18,227.50	$27,416.63	$210,194.13
2HH137	Rebecca Menuela	Not listed	17°44'31.53"S	15°49'39.37"E	$508,845.00	$35,442.25	$81,643.09	$625,930.34
2HH138	Wilhelm Hamukwaya	0818950869	17°44'21.50"S	15°49'23.41"E	$30,000.00	$4,500.00	$5,175.00	$39,675.00
2HH139	Sam Shilonko	0814250457	17°44'23.94"S	15°49'1.19"E	$42,600.00	$6,390.00	$7,348.50	$56,338.50
2HH140	Fillemon Shipanga	Not listed	17°44'3.84"S	15°48'36.88"E	$45,000.00	$6,750.00	$7,762.50	$59,512.50
2HH141	Frans Andreas	0813293686	17°43'59.50"S	15°48'27.68"E	$148,595.00	$17,429.75	$24,903.71	$190,928.46
2HH146	Festus Napuka	0814014358	17°43'43.87"S	15°47'40.98"E	$15,000.00	$2,250.00	$2,587.50	$19,837.50
2HH147	Matheus Shinyengu Kleyuu	0814854156	17°43'35.31"S	15°47'32.10"E	$448,800.00	$32,440.00	$72,186.00	$553,426.00
2HH148	Johannes Mulongeni	0813236009?	17°43'32.65"S	15°47'30.54"E	$25,000.00	$3,750.00	$4,312.50	$33,062.50
2HH149	Naekman Kandenge	0813010406	17°43'12.63"S	15°46'42.12"E	$251,175.00	$22,558.75	$41,060.06	$314,793.81
2HH151	Magdalena Shoombe	Not listed	17°43'1.56"S	15°46'17.56"E	$32,500.00	$4,875.00	$5,606.25	$42,981.25

Section 3 Total					**$12,290,965.00**	**$1,014,147.05**	**$1,995,766.81**	**$15,300,878.86**
SECTION 4								
Household	*Owner*	*Number*			*Compensation Owed*	*Disturbance*	*Contingency*	*Total*
HH 30	Joshua Sheawali	0816160386	18°19'23.06"S	16°42'42.18"E	$17,525.00	$4,128.75	$3,248.06	$24,901.81
HH 40	Ndafelau Moses	0812052035	18°17'44.47"S	16°40'54.83"E	$68,700.00	$10,305.00	$11,850.75	$90,855.75
HH 53	Not listed	Not listed	18°15'30.84"S	16°38'18.78"E	$15,570.00	$2,335.50	$2,685.83	$20,591.33
HH 59	Daniel Nuunyango	0812397694	18°13'26.12"S	16°35'48.87"E	$28,350.00	$4,252.50	$4,890.38	$37,492.88
HH 72	Aina	Not listed	18°10'30.22"S	16°31'7.80"E	$15,225.00	$2,283.75	$2,626.31	$20,135.06
HH 95	Letishia Hanyengo	0813366771	18° 6'38.57"S	16°21'59.31"E	$21,405.00	$3,210.75	$3,692.36	$28,308.11
HH 96	Werner Emelita	0814312626	18° 6'36.31"S	16°21'50.68"E	$19,860.00	$2,979.00	$3,425.85	$26,264.85
HH 113	Not listed	Not listed	18° 5'2.41"S	16°18'15.92"E	$20,475.00	$3,071.25	$3,531.94	$27,078.19
Section 4 Total					**$207,110.00**	**$32,566.50**	**$35,951.48**	**$275,627.98**
Totals					**$12,498,075.00**	**$1,046,713.55**	**$2,031,718.28**	**$15,576,506.83**

Appendix A: Guide to tree species of high concern (taken from Mannheimer & Curtis (eds) 2009)©

Acacia erioloba

camel-thorn, omuthiya, omumbonde, omuonde, Kameldornbaum, kameeldoring, ||ganab

The camel-thorn is one of the most common and best known trees of Namibia and deserves the status of 'national tree' if such a tree had to be selected. Semi-deciduous or deciduous tree with **spreading crown, up to 20 m high**; common and widely distributed, preferring sandy soils, depressions and dry riverbeds. BARK **dark grey to blackish, rough with vertical fissures**; young branchlets red-brown to plum-coloured, shiny, smooth, with **characteristic zig-zagging** between nodes. THORNS straight, paired, grey-white with black flecks, rigid, sharp, often with a pale brown tip. LEAVES twice-compound; 1–3 leaves per thorn axil; each pinna bearing 6–15 leaflet pairs; leaflets narrowly linear. FLOWERS golden-yellow. FRUIT a woody, velvety pod; young pods with rust to red-brown covering; older pods **ear-shaped** to sickle-shaped, grey**.**

Acacia sieberiana

paper-bark acacia, Papierrindenakazie, mutubatuba, muhengeva

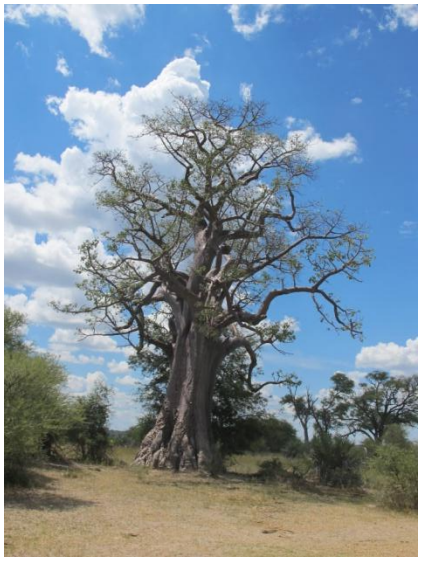
Deciduous tree with **spreading crown**, **7–12 m high**; found in the far north, Caprivi and in the vicinity of the Okavango River on floodplains, river banks and sandy plains. BARK **yellowish-brown or grey-brown**, rough, **papery, flaking off** to expose a yellow underbark; young branchlets grey-yellow to golden-yellow, downy. THORNS **straight**, paired, up to **70 mm long, slender, white** to pale brown with black flecks. LEAVES twice-compound; each pinna with **20–40 leaflet pairs**; leaflets linear-oblong, **2–5 x c. 1 mm**; pale to dark green above, pale green below. FLOWERS cream-coloured to white. FRUIT a woody pod, up to 150 x 25 mm **and 10 mm thick, straight to slightly sickle-shaped, woody, hairless**, brown; seldom splitting open when mature.

Adansonia digitata

baobab, kremetartboom, omukwa, lemonade tree, Affenbrotbaum, divuyu, #'òm

Deciduous tree, up to 20 m high, with a **characteristically massive trunk**; strangely grotesque; occurs on plains, hill slopes and floodplains in the north-western and north-eastern parts of the country on both sandy and rocky substrates. BARK smooth, pinkish-brown to grey to grey-brown, often convoluted. LEAVES of young trees simple, those of older trees **5–7-palmately compound**, mostly terminally clustered on branch tips; leaflets dark green above, initially downy; pale green below, initially densely covered with long, soft, stellate hairs, becoming sparsely hairy to almost hairless; margin smooth. FLOWERS **up to 120 mm in diameter, pure white, hanging on long stalks**; **5 crinkled, waxy petals curl back**; **numerous stamens fuse to form a central column**. FRUIT ovoid to obovoid, 200–300 x 100–180 mm somewhat woody, with dirty, olive-green, velvety covering.

It is estimated that the baobab can reach an age of 1000 years or more.



Boscia albitrunca

shepherd's tree, witgat, omutendereti, omunkunzi

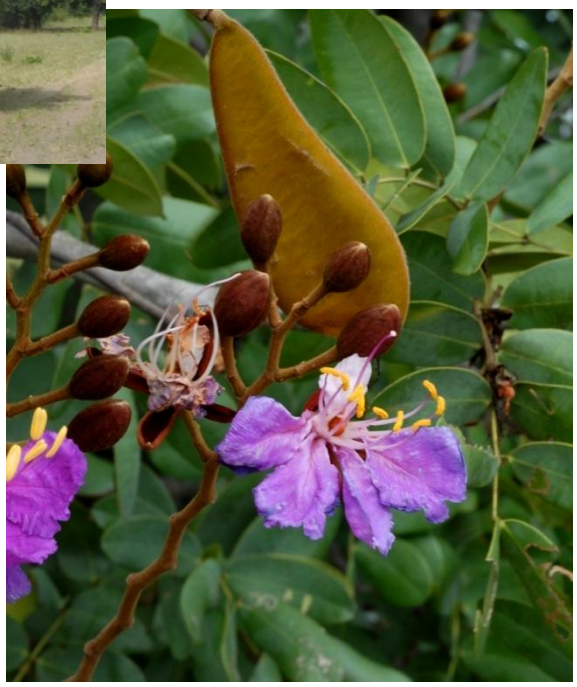
Evergreen shrub or tree, up to 10 m high; widespread in Namibia, occurring in many different habitats and exhibiting a range of different growth forms. BARK **pale in colour, almost white**, although may be partially grey or occasionally yellow; rough, especially where flaking has occurred. LEAVES simple, spirally arranged, solitary or in clusters of 2–4 on dwarf shoots; **blade oblong or oblong-elliptic, 10–55 x 3–10 mm**; thick, leathery, brittle, slightly rough; **both surfaces grey-green to dark green**, practically hairless; midrib prominent, yellowish; margin smooth, finely fringed with hairs; tip blunt to shallowly notched, often with tiny hair-like tip. FLOWERS small, green-yellow; August to February. FRUIT spherical, c. 10 mm in diameter; yellow when ripe. SEEDS round to kidney-shaped, with brittle cream-coloured warty shell; one to several embedded in bright orange flesh.

The shepherd's tree grows in conditions ranging from arid to subtropical. This species has many uses, making it an important component of the vegetation wherever it occurs. It is also an important shade tree.

Baikiaea plurijuga

Zambezi teak, Rhodesian teak, uhahe, omupapa, ghukuthi, omuzumba

Deciduous tree with dense, spreading crown, **up to 20 m high**; confined to dry woodlands, growing on Kalahari sand; occurs mainly in the north-east, but may also be found near Ruacana. BARK rough, grey to dark brown, or smooth, grey and flaking off in longitudinal strips; young branchlets densely woolly. LEAVES evenly pinnate, alternate, bearing 4–6 leaflet pairs; leaflets opposite, oblong to narrowly elliptic, 35–75 x 15–30 mm, leathery; dark green above, pale green and matt below, both surfaces downy; **apex slightly indented, with short bristle**; base blunt. FLOWERS conspicuous, 20–30 mm long; **petals pink to mauve**, **crinkly**; buds with golden-brown downy hairs. FRUIT a **flattened , woody pod**, **covered with rust-brown, densely woolly covering; tip broader than base**; splitting open loudly when ripe, and shooting seeds in all directions, **valves then twisting into spirals**.



Berchemia discolor

bird-plum, ombe, omuve, wilde dadel, mukerete, wilde Dattel, |urehaib

Deciduous or semi-deciduous tree with a **rounded crown**, up to 12 m high; common and prominent tree in the north, where it is left standing when woodlands are cleared for fields and homesteads. BARK grey to dark grey, vertically and transversely fissured, rough; branchlets with pale, plum-coloured bark and white lenticels, with dense, grey, downy covering when young; older branchlets brown to plum-coloured with darker lenticels. LEAVES simple, alternate or spirally arranged, opposite or opposite with successive pairs at right-angles to each other; **elliptic to oblong-elliptic to obovate**, 30–120 x 15–60 mm; **dark green, shiny and smooth above**, **lateral veins prominent,** pale green below; margin smooth. FRUIT an ovoid-oblong berry, *c*. 20 x 8 mm; **fleshy, yellow when ripe**.

Combretum imberbe

leadwood, omumborombonga, hardekool, Ahnenbaum, munyondo, omukuku, |haab

Semi-deciduous tree, up to 20 m high; a typical constituent of riverine vegetation, although it also occurs on plains and hill slopes, and is found in central and northern areas. BARK whitish to **pale grey to dark grey**, rough with **characteristic deep, vertical and transverse fissures dividing the bark up into small, square fragments**; branchlets covered in dense, silver to rust-red scales. LEAVES simple, with successive pairs set at right-angles to each other; narrowly elliptic to oblanceolate, 30–80 x 9–40 mm; **both surfaces grey-green, giving the entire tree a characteristic colour**, hairless **with silvery, microscopic scales**; margin entire, **often sinuate**; often with a fine, hair-like tip. INFLORESCENCE an axillary spike or terminal spray, up to 80 mm long. FRUIT 4-winged, **ovate** to spherical, **small**, 10–20 x c. 15 mm; **characteristically yellow-green and densely covered in scales**; **wings papery, densely covered in small, silvery scales**.

Many of the finest specimens of leadwood in southern Africa are found in Namibia. This, together with the fact that they are very slow growing – some specimens of this tree have been determined to be more than 1000 years old – necessitates special protection measurements to conserve these old giants.

Diospyros mespiliformis

jackal-berry, Schakalsbeerenbaum, omwandi, omunyandi, jakkalsbessie, ghutunda

Tall, erect, almost evergreen tree, up to 16 m high, **with dark foliage turning yellow before falling**; found in riverine vegetation along the perennial rivers and around pans in the north. BARK grey **to black-grey, rough, transversely fissured**, crumbly; branchlets with yellow to red, densely woolly covering. LEAVES simple, alternate; lanceolate to **elliptic, leathery, 40–140 x 15–35 mm**; **shiny, dark green above,** pale green below; margin entire. FRUIT a berry, almost spherical, up to 25 mm in diameter, with a fine, hair-like tip; fleshy, hairless to sparsely downy, **yellow to purple when ripe**; calyx persistent, encircling one-third of the fruit; edible.

This imposing tree, with its dark, brooding appearance, is easy to identify from far off, often being the tallest tree around where it occurs.

Entandrophragma spicatum

Owambo wooden-banana, omataku

Deciduous tree, **10–12 m high**; known only from the Kaokoveld and the central-north, usually grows on deep sand, but may also be found on rocky hill slopes. BARK pale to dark grey, peeling off in large pieces to expose a yellowish underbark. LEAVES evenly pinnate, clustered at branch tips; bearing 3–7 pairs of leaflets although leaflets occasionally unpaired; **leaflets circular to elliptic to broadly elliptic**, paler green above, sparsely downy, veins prominent; margin entire, fringed with hairs, turned under; apex blunt, occasionally shallowly notched; base blunt. FRUIT **a cylindrical capsule, 110–160 mm long, woody, splitting into 5 valves which recurve from central column, creating the impression of a peeled banana**. SEEDS winged.

Ficus sycomorus

sycamore fig, cluster fig, omukuyu

Striking, semi-deciduous, single-stemmed tree, up to 20 m high; trunk diameter up to 2 m; **crown spreading** with a span of up to 45 m; found on plains, riverbanks and near pans, depressions and springs in western and northern areas of Namibia as well as the Naukluft and the south-western escarpment.

STEM distinctly fluted at the base. BARK **characteristically yellow** to yellow-brown or greyish with a yellow tinge; relatively smooth with rough, grey patches flaking off to expose a yellow underbark. LEAVES simple, spirally arranged; **blade circular to ovate**, **stiff, rough and leathery**; dark green, matt or slightly shiny above, dark olive-green below, matt, covering as above, **veins prominent with conspicuous secondary veins originating at base**; margin entire, irregularly crenate, fringed with hairs, turned under, undulate; FIGS borne in dense clusters on main stem and branches or solitary in leaf axils, 15–30 mm in diameter.

Schinziophyton rautanenii

manketti, ugongo, omunkete, Mankettibaum, Ölfruchtbaum

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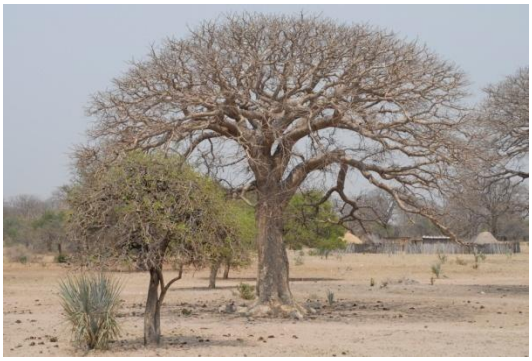
Large, attractive, deciduous tree with **spreading crown**, 15–20 m high; known from the central-northern and north-eastern areas of Namibia, growing on sandy substrates. BARK smooth, **yellowish to yellow-grey** to grey with a greenish tint, round flat pieces peeling off to expose a yellowish underbark. LEAVES **5–7-palmately compound**; petiole dense rust-brown hairy, with 2 prominent green glands at tip, base thickened; leaflets dark green above with dense rust-brown, stellate hairs; pale yellow-green below, with brown-white, finely woolly covering, midrib and lateral veins prominent and pale yellow-green; young leaflets with a yellowish or brownish down; margin entire in young leaves but later finely serrate; apex blunt to somewhat pointed; base asymmetric. FRUIT smooth, ovoid, **nut-like**, 1-seeded; flesh mealy. SEEDS enclosed in hard shell.



Sclerocarya birrea

marula, maroela, omungongo

Large, attractive deciduous tree, 10–18 m high, sometimes even bigger, with a dense spreading crown; occurs in most parts of northern Namibia on sandy to sandy loam soils, mainly on plains but also in other habitats. BARK **covered with irregular, flat, dark grey scales**; **young branchlets with conspicuous leaf scars**. LEAVES unevenly compound, usually clustered on branch tips, up to 300 mm long; leaflets ovate to broadly obovate, orbicular or elliptic, dark green, hairless, with a dull, waxy coating; **margin entire or only so along upper margin with lower margin coarsely dentate (especially in young plants)**; apex acute or with a distinct, sharply tapering point; base tapering to truncate, often oblique. FRUIT almost spherical, tough-skinned, up to 40 mm in diameter, pale creamy yellow when ripe; edible.

The marula is one of the best-known trees in Namibia due to its numerous uses; it plays an important role in the life of many rural Namibians.