



ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION OF KHOMAS SUBSTATION

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1. INTRODUCTION

The purpose of this document is, to provide an indication of the anticipated impacts of the construction of the Khomas substation on the receiving environment and mitigation measure to be implemented to minimise impacts. This Environmental Management Plan (EMP) document will ensure sound environmental performance by all contractors and NamPower employees during the construction of the substation.

2. OBJECTIVES OF THE CONSTRUCTION EMP

The aim of this construction EMP is to detail the management actions required to implement the mitigation measures identified thereby ensuring that any construction phase activity is carried out in a manner that takes cognisance of sustainable development and is in line with National legislation. These actions are required to minimise negative impacts and enhance positive impacts associated with the operations.

It is important to note that an EMP is a working document and therefore may be updated and amended as new information (e.g., environmental data), policies, authority guidelines and technologies becomes available.

Positive and negative impacts as well as impacts which may affect both the social and natural environment have been considered to provide a complete picture of the impacts that the project may have on the receiving environment.

3. ROLES AND RESPONSIBILITIES

It is the responsibility of NamPower to ensure that all management actions are carried out. The successful implementation of the EMP is, however dependant on clearly defined roles and responsibilities by several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase of the project.

The following roles and responsibilities have been identified as it pertains to this project:

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 SHEW 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.

NamPower SHEW

- To ensure that all requirements with regards to this EMP are fulfilled.
- Assist the Project Manager in ensuring the contractor remains in compliance with this EMP.
- Provides SHEW 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

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 SHEW policies and procedures 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 SHEW section
- Ensuring that all employees receive a SHEW induction before the start of the project.
- Ensuring that the work being done does not create a nuisance to any being working, residing or living on adjacent properties or within the immediate surroundings of the site.

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

4. RECORDING AND REPORTING

The ECO assigned by NamPower to the project, shall submit an environmental compliance report at regular intervals (to be agreed at the onset of the project), in writing, to the Project Manager. These reports shall include a description of all activities on site, problems identified, non-conformances noted, and remedial action implemented.

Records relating to compliance monitoring shall be kept on site and will be made available for inspection by relevant competent authority which in this instance will be the Ministry of Environment and Tourism. Matters shall also be discussed during site meetings and project meetings.

5. ENVIRONMENTAL MANAGEMENT AND TRAINING

Before any work is commenced on the site, the Contractor shall ensure that adequate environmental awareness training of site personnel takes place and that all employees receive an induction presentation on the importance and implications of the EMP. The Contractor shall liaise with the Project Manager prior to the commencement date to fix a date and venue for the induction and to agree on the content.

The Contractor shall provide a suitable venue and ensure that the specified employees attend the course. Contractor shall ensure that all attendees sign an attendance register.

As a minimum, training must include:

- Explanation of the importance of complying with the EMP,
- Discussion of the potential environmental impacts of construction activities,
- The benefits of improved personal performance,
- Employees' roles and responsibilities, including emergency preparedness,
- Explanation of the mitigation measures that must be implemented when carrying out their activities,
- Explanation of the specifics of this EMP and sensitive areas,
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.

The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

6. DESCRIPTION OF ACTIVITIES TO BE UNDERTAKEN

One of the main purposes of the environmental assessment process which was carried out for this project was to understand the significance of potential impacts associated with the proposed activity. Issues or impacts of less significance were screened out of the assessment process, with supporting reasons to ensure that the study focuses on the potentially "significant impacts" identified for the proposed site. Potentially significant impacts may be experienced in terms of waste (hazardous and general waste) increased resource use, habitat destruction and socio-economic aspects. It must be noted that the proposed site is located within an already environmentally disturbed area.

Aspects related to construction phase were evaluated in the scoping report and include socio-economic development, biodiversity loss, waste generation, dust, noise pollution and traffic.

Once the aspects and their related impacts were identified, the mitigation measures were drafted as seen below in Construction phase EMP.

7. NON-COMPLIANCE PROCEDURES DURING CONSTRUCTION

The contractor shall comply with the environmental specifications and requirements as included in this document and any failure on their part will entitle the Project Manager to impose corrective actions required. This might include possible penalties as deemed

appropriate by NamPower policies and procedures. In the event of non-compliance, the following recommended process shall be followed:

- Non-compliances will be identified during inspections or audits carried out by the ECO or NamPower SHEW section and reported to the Project Manager for corrective action.
- The Project Manager shall issue a notice of non-compliance to the Contractor, stating the nature and magnitude of the contravention and shall be discussed at project site meetings.
- The Contractor shall act to correct the non-conformance within 14 days of notification.
- The Project Manager shall at all times have the right to stop work and/or certain activities on site in the case of non-compliance or failure to implement remedial measures.
- If a trend of non-conformances or of unresponsiveness to non-conformances is identified, it is up to the discretion of the Project Manager to follow the appropriate NamPower procedure to limit a contractor's ability to carry out future work for the company for a given period of time

8. SUB-CONTRACTOR MANAGEMENT

The contractor shall in writing inform its sub-contractors and issue them a copy of this EMP and SHE Plan. Sub-contractors shall indicate in writing their commitment to comply with these plans. The Contractor has the overall responsibility of ensuring that all its sub-contractors comply with both plans.

9. ENVIRONMENTAL MONITORING AND AUDITING

Environmental monitoring must be conducted at least once every month during construction and operation. Benefits derived from the monitoring and final audit process might include:

- identification of environmental risk.
- development or improvement of the environmental management system.
- avoidance of financial and time loss.
- avoidance of legal sanctions.
- increase in staff awareness.
- identify potential cost savings.

Commonly, the environmental monitoring or audit of a site will cover all management procedures, operational activities & systems, and environmental issues and will be carried out by the NamPower SHEW section.

10. DOCUMENTATION, RECORD KEEPING AND REPORTING

It is vital that an appropriate document handling and retrieval system be developed for all EMP documentation. This will ensure that there is adequate EMP documentation control and will facilitate easy document access and evaluation. EMP documentation must include:

- EMP implementation activity specifications.
- Induction records.
- monitoring reports.

Responsibilities must be assigned by the NamPower responsible persons/contractor to relevant personnel for ensuring that the EMP documentation system is maintained, and that document control is ensured through access by and distribution to, identified personnel.

Document control is important for the effective functioning of an EMP. A document handling system must be established to ensure adequate control of updating and availability of all documents required for the effective functioning of the EMP. This procedure applies to the EMP as well as procedures and policies relating to the EMP, which must be controlled (i.e., identified, registered and changes recorded).

11. SUBSTATION CONSTRUCTION PHASE ENVIRONMENTAL MANAGEMENT PLAN

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Environmental Awareness	Minimise the occurrence of environmental impact on the work and surrounding area.	<ul style="list-style-type: none"> • All staff to receive environmental awareness training. • All new staff coming onto site shall receive environmental awareness training. • Refresher environmental awareness training to be available when required. • The contractor shall erect and maintain information posters at key locations on site. • All staff are to be made aware of their individual roles and responsibilities in achieving compliance with the environmental authorisation and EMP. • 	Project manager, Environmentalist, and contractor
Construction site establishment	Ensure that environmental issues are taken into consideration in planning and construction of site establishment	<ul style="list-style-type: none"> • A method statement shall be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of the key infrastructure and services where applicable, including but not limited to offices, overnight vehicle parking areas, stores, stockpile, laydown area, hazardous material storage areas and placement of staff accommodation, cooking and ablution facilities, waste, and wastewater management. • Location of camp must be carefully considered and approved by the Environmental Officer. • The use of existing accommodation for contractor staff, where possible is encouraged. 	Project manager, Environmentalist, and contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
No-Go areas	Construction related activity inside No-Go areas is prevented to avoid environmental impacts to such areas.	<ul style="list-style-type: none"> • Areas outside the project area must be treated as no-go areas. • Erect, demarcate and maintain temporary fence around perimeter of any no go area. • Unauthorised access and construction related activity inside No-Go areas is prohibited. 	Project manager, Environmentalist, and contractor
Access Road	Minimise impact to the environment through planned and controlled movement of vehicles on site	<ul style="list-style-type: none"> • Maximum use of existing roads and tracks shall be implemented. 	Project manager, Environmentalist, and contractor
Fencing and gate installation	Ensure safe and controlled access to the site through the erection of fencing and gates were required	<ul style="list-style-type: none"> • Fenced areas with gates access will remain locked after hours, during weekends and on holidays if staff are away from site. • All demarcation fencing and barriers shall be maintained in good working order for the duration of the construction period. • Use of existing gates provided to gain access to all parts of the defined working area where possible. 	Project manager, Environmentalist, and contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Waste management	To avoid, manage and mitigate potential impacts to the environment caused by wastewater discharge during construction	<ul style="list-style-type: none"> • Appropriate pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into watercourses or water bodies shall be designed and implemented. • Runoff from the cement/concrete batching areas shall be strictly controlled and contained water shall be collected, stored, either treated or disposed of-site at a location approved by the environmental officer. • All spillages of oil onto concrete surface shall be controlled by use of approved absorbents material and the used absorbents material disposed of at an appropriate waste disposal facility. • 	Contractor
Solid waste Management	To avoid, manage and mitigate potential impacts to the environment caused by incorrect storage, handling and general disposal of general and hazardous solid waste.	<ul style="list-style-type: none"> • Sufficient, covered waste collection bins shall be provided onsite. • Waste shall be segregated into separate bins and clearly marked for each waste type. • Staff shall be trained in waste segregation. • Bins shall be emptied regularly. • General waste shall be disposed of at recognised and registered waste disposal sites/recycling companies. • Hazardous waste shall be disposed of at a registered waste disposal site. • Certificates of disposal for general waste ,hazardous waste shall be maintained. • Under no circumstances shall any waste be disposed of ,burned or buried on site. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Hazardous Substances	Minimise the risk of impact to the environment through safe storage, handling use and disposal of hazardous substances	<ul style="list-style-type: none"> • All hazardous substance will be stored in suitable containers as defined in the method statement or Material safety data sheet (MSDS). • Containers will be clearly marked to indicate contents, quantities and safety requirements. • All storage areas will be bunded. The bund ate will be of sufficient capacity to contain a spill/leak from stored containers. • The contractor shall ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers. • The tanks /bowsers shall be situated on a smooth impermeable surface(concrete) bund. The impermeable lining shall extend to the crest of the bund and volume inside the bund shall be 130% of the total capacity of the storage tanks/bowser (110% statutory requirement plus an allowance for rainfall). • Adequate firefighting equipment shall be made available at all hazardous storage areas. • In an event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of at approved dumpsite. • No smoking shall be allowed within the vicinity of the hazardous storage area. • Dirt drums shall be stored on a drip tray or within a bunded area. 	Contractor
Batching plant	Control concrete and cement	<ul style="list-style-type: none"> • Concrete mixing shall be carried out on an impermeable surface such as on boards or plastic sheeting or within a bunded area with an impermeable surface). 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
	batching activities in order to prevent spillage and contamination of soil, surface water and ground water	<ul style="list-style-type: none"> • Bagged cement must be stored in an appropriate facility and at least 10m away from water drains. • Hardened concrete from washout facility or concrete mixer must be either reused or disposed of at an appropriate licenced disposal facility. • Any access sand and stone and cement must be removed from site on completion of the construction phase. • Ready mix concrete is encouraged. 	
Vegetation clearing	To ensure the safe mechanical and electrical construction and operation of the substation without causing unnecessary environmental damage.	<ul style="list-style-type: none"> • Indigenous vegetation which does not interfere with safe construction and operation of the substation shall be left undisturbed. • Alien invasive vegetation should be removed from site. • A register shall be kept of all details of herbicide usage. • Only registered pest control operator may apply herbicides on site. • Permits for removal must be obtained from the competent authority prior to cutting or clearing affected species. 	Project manager, Environmentalist, and contractor
Protection of Fauna	Ensure care is taken to minimise disturbance to fauna during construction	<ul style="list-style-type: none"> • The breeding sites of raptors and other wild birds species in close proximity to be protected. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Protection of heritage resources	Prevent damage and destruction to fossils, artefacts and materials of heritage significance.	<ul style="list-style-type: none"> • Carryout general monitoring of excavation for potential fossils, artefacts and materials of heritage importance. • All work must cease immediately, if any human remains or other archaeological chance find are uncovered. Such materials must be reported to archaeologist so that a systematic and professional investigation can be undertaken. 	Project manager, Environmentalist, and contractor
Safety of the public	Reasonable measures are taken to always ensure the safety of the public during construction.	<ul style="list-style-type: none"> • Identify fire hazards, demarcate, and restrict public access to the site. • All unattended open excavations must be adequately fenced or demarcated. • Maintain an incident and complaints register. 	Contractor
Sanitation	Supply suitable located, clean and well-maintained toilet facilities in an effort to minimise the risk of disease and impact on the environment.	<ul style="list-style-type: none"> • Mobile toilets are to be installed onsite if no other ablution facilities are available. • No indiscriminate use of the veld for the purposes of ablutions shall be permitted. • Ablution facilities shall be located within 100m of the work area. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Prevention of disease		<ul style="list-style-type: none"> • Free condoms must be provided onsite at a central point. • Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS. • Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community where applicable. 	Contractor
Increase in traffic and Safety and Emergency situations	Minimise potential risk of injury and/or death to third parties.	<ul style="list-style-type: none"> • The existing track will be used as an access route only. • Access by third parties shall be recorded and all parties will be made aware of the risks site. • Warning signs will be installed where necessary. • Basic road safety behaviour for all contractors, especially drivers, through training and awareness will be undertaken. Typical issues include: <ul style="list-style-type: none"> ○ Keeping to safe speed limits. ○ Ensuring that all drivers have valid licenses. ○ Making sure that all vehicles are roadworthy. ○ Zero tolerance for drinking and driving. ○ Using lights appropriately for visibility. • Road accidents are considered emergencies and will be handled in accordance with the NamPower's Emergency Response Procedure(s). 	Project manager, Environmentalist, and contractor
Noise from transportation activities	Manage increase in disturbing	<ul style="list-style-type: none"> • All noise generating activities will be kept to a minimum. • No traffic, unless in emergencies or if continuous pouring of concrete will be allowed, between sunset and sunrise. Concrete 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
	noise levels (nuisance) Nuisance and health impacts	pouring activities should be planned such that they occur during the morning hours to avoid late night driving. <ul style="list-style-type: none"> • Traffic activities will be limited to the daylight hours between sunrise and sunset to avoid undue noise disturbance to neighbouring households. • Compliance with relevant standards, specifications and legislation concerning noise will be adhered to. 	
Dust and other air emissions	Manage increase in dust levels (nuisance & health impacts)	<ul style="list-style-type: none"> • Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. • Dust generation from all activities will be minimised wherever possible. • A maximum speed limit of 20 km/h will be enforced to control dust emissions and minimize incidents onsite. • Transport of construction material will ensure measures to prevent fugitive dust emissions. • Dust suppression measures shall be implemented if necessary. Dust may be controlled by damping of the road with water when necessary to minimise nuisance dust. • Construction machinery and equipment will be maintained in good working order in order to minimise exhaust fumes. 	Contractor
Site Rehabilitation	Minimize visual and ecological pollution	<ul style="list-style-type: none"> • Rehabilitate all features, infrastructure associated with the construction phase that is not in use. • All areas disturbed by construction activities shall be subjected to rehabilitation. 	Environmentalist

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<ul style="list-style-type: none"> • All spoil and waste will be removed to a registered waste site and certificate of disposal provided. • All equipment used as part of construction to be removed from site. 	



ENVIRONMENTAL MANAGEMENT PLAN FOR THE OPERATION OF THE KHOMAS SUBSTATION

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LIST OF TERMS, ACRONYMS AND ABBREVIATIONS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMA	Environmental Management Act no 7 of 2007
EMP	Environmental Management Plan
MET	Ministry of Environment and Tourism
SHEW	Safety, Health, Environment and Wellness
PCO	Pest Control Officer
ECO	Environmental Control Officer
MSDS	Material Safety Data Sheet

DEFINITIONS

Construction: Means the building, erection or modification of a facility, structure or infrastructure that is necessary for undertaking of an activity including the modification, alteration, upgrading or decommissioning of such facility, structure or infrastructure.

Contractor: Means a person (other than a NamPower employee) or a company contracted/legally appointed by NamPower to perform work for NamPower on a NamPower site/premises.

INTRODUCTION

This Operational Environmental Management Plan (EMP) will ensure sound environmental performance by all contractors and NamPower employees during the operation of the substation.

AIMS

The aim of this operational EMP is to detail the management actions required to implement the mitigation measures identified thereby ensuring that any operational phase activity is carried out in a manner that takes cognisance of sustainable development and is in line with National legislation. These actions are required to minimise negative impacts and enhance positive impacts associated with the operations.

It is important to note that an EMP is a working document and therefore may be updated and amended as new information (e.g. environmental data), policies, authority guidelines and technologies develop especially during operational phase of this Substation.

The operational EMP is concise and practical to ensure easy implementation and compliance by all involved in this project and during operation of the substation.

Positive and negative impacts as well as impacts which may affect both the social and natural environment have been considered to provide a complete picture of the impacts that the project may have on the receiving environment.

SCOPE OF WORK

The following operational phase activities describe the scope of work to be conducted in future at the Khomas Substation:

Operational phase activities

- a. Maintenance of the substation , NamPower will maintain the substation to ensure its reliability and safety and annual review will be conducted and any maintenance to be carried out as required.
- b. General site inspection to be carried out by the technical and Safety ,Health ,Environment and Wellness Departments.
- c. Extension or upgrading of the substation infrastructures in terms of additional line bays involves the following:
 - i) Construction of temporary or permanent buildings (digging and setting of foundations, digging of cable trenches)
 - ii) Extension of boundary fences

- iii) Construction of additional feeder bays
 - iv) Upgrade of electrical equipment (either in size, capacity or technology)
 - v) Connection of new lines to Substations
- d. Vegetation Management
 - i) Manually
 - ii) Mechanically
 - iii) Herbicide application
 - iv) Combination of one or two methods
- e. Site inspections
 - i) Technical
 - ii) SHEW
- f. Substation housekeeping, and refurbishment of buildings
- g. Distribution of electricity
- h. Maintenance
 - i) Replacement of batteries
 - ii) Servicing batteries
 - iii) Replacing electrical equipment such as transformers, relays and capacitors
 - iv) Maintenance of electrical equipment such as transformers, relays and capacitors
 - v) Construction or repairing of access roads
- i. Daily office activities

It is important to note that all environmental issues will be considered from the onset of the project to ensure environmental best practice is incorporated during the construction phase.

SPECIFIC CONDITIONS

The following conditions shall be applicable to all NamPower employees, contractors and consultants entering the Khomas Substation site:

- The Substation is a restricted area, public should be allowed to enter without approval and/or without induction.
- Moderate speed of 20km/hr should be maintained on access roads to minimize on access roads to minimize or avoid dust pollution, especially close to homesteads, clinics, schools or trading stores.
- Site vehicles should be permitted only on existing roads. Vehicles are not permitted on re-vegetated areas and site traffic should be limited to prevent unnecessary damage to the natural environment.
- Vehicles transporting the construction material and/or hazardous material should be supplied with oil spillage mop-up kits.

- The drivers of these vehicles should know the emergency contact details, should there be an accidental oil spillage.
- Safety check on the transported material must be conducted prior to the delivery and after re-loading.
- Caution must be taken when operating the existing cabinets, as they are often inhabited by bees, wasps and hornets.
- Storm water runoff must be managed efficiently so as to avoid storm water damage and erosion to adjacent properties.
- All decommissioned equipment (e.g. cabling, acid batteries, AC/DC panels etc.) should not be left on site.
- Non-reusable or non-recyclable materials should be disposed of at the Swakopmund Municipal dumpsite as it is registered to carry such waste.
- Dust emitted during construction activities must be controlled by means water suppressants.
- Temporary ablution facilities must be provided on site.
- Vegetation management can only be undertaken with a valid ECC in place and as per the NamPower Herbicide Application Procedure (see Annexure 2) and the NamPower Herbicide Application EMP (see Annexure 3).
- During the replacement of certain equipment, the following must be considered.
 - All decommissioned equipment from the substation (e.g. faulty transformers, cracked or rotten poles and faulty cables, old re-closers and sectionalizes) shall not be left on site. Reusable and recyclable materials shall be sent to Brakwater stores.
 - All oil spill incidents shall be reported to the Environmental Section (See contact details below) and the incident report form completed and submitted to the Environmental Section.
 - Absorbent cushions should be utilized to ensure that oil does not come out of the outlet. This cushion is primarily used to trap oil. A cushion must be placed inside the bund wall itself, but at the mouth of the outlet.
- It is the responsibility of the Asset owner to ensure that these bund walls are maintained properly i.e. periodically changed when necessary.
 - Where applicable all eroded areas on access road must be rehabilitated by: Levelling and straightening all spoiled areas within and around the substation; and storm water diversion berms must be constructed on the access road where applicable.
- Fire extinguishers must be always available on site.
- The site must be rehabilitated to its original state after any operational phase activities have been undertaken.

LEGISLATION

All actions going forward should take cognisance of the relevant laws to ensure that the project remains within the scope of the law. The *table 1* provides a summary of the main pieces of national legal requirements which needs to be taken into consideration during operational phase activities:

Table 1. Legislation applicable to the proposed development

<i>Legislation:</i>	<i>Section applicable:</i>	<i>Implications:</i>
Environmental Management Act no 7 of 2007	<ul style="list-style-type: none"> • Section 3 	<ul style="list-style-type: none"> • All activities performed should be in line with the following principles: <ul style="list-style-type: none"> ○ Interested and affected parties should have an opportunity to participate in decision making ○ Listed activities should be subject to an EIA ○ Polluter should pay for rehabilitation ○ Pollution should be minimised
	<ul style="list-style-type: none"> • Section 27 	<ul style="list-style-type: none"> • Environmental assessments should be carried out for listed activities. The proposed activity can be classified under the following range of activities: <ul style="list-style-type: none"> ○ Land use and transformation
	<ul style="list-style-type: none"> • Section 33 onwards 	<ul style="list-style-type: none"> • These sections details the process to be followed in order to obtain a clearance certificate
	<ul style="list-style-type: none"> • Section 57 	<ul style="list-style-type: none"> • All existing listed activities must obtain a clearance certificate within one year of the law coming into affect (February 2013). Therefore, all existing activities which can be considered a listed activity should apply for clearance.
EMA Regulations GN 28-30 (GG 4878) (February 2012)	<ul style="list-style-type: none"> • Listed activity: 5.1 • 6 – 9; 13; 15; 21 -24 	<ul style="list-style-type: none"> • This activity can be considered a rezoning of property from Undetermined to civic • These sections details the process to be followed in terms of producing an Environmental Assessment, and this process should be adhered to during the generation of information for this document
Labour Act no 11 of 2007	<ul style="list-style-type: none"> • Section 3 • Section 4 	<ul style="list-style-type: none"> • Children under the age of 16 may not be employed
	<ul style="list-style-type: none"> • Section 9 	<ul style="list-style-type: none"> • Forced labour may not be used during any construction activities • Basic conditions of employment, as stipulated by the law, must be met
	<ul style="list-style-type: none"> • Section 39 - 42 	<ul style="list-style-type: none"> • The employer shall ensure the health and safety of all employees and non-employees on site. Employees must fulfil their duties in order to ensure their own health and safety and that of other employees and persons. Employees may leave the work site if

<i>Legislation:</i>	<i>Section applicable:</i>	<i>Implications:</i>
Water Act no 54 of 1956	<ul style="list-style-type: none"> • Section 21 and 22 • Section 23 	<p>reasonable measures to protect their health are not taken.</p> <ul style="list-style-type: none"> • Conditions in terms of the disposal and management of effluent are to be adhered to • Any person causing pollution to a water source shall be guilty of an offence
Soil Conservation Act no 76 of 1969	<ul style="list-style-type: none"> • Section 4 	<ul style="list-style-type: none"> • Institutions may be ordered by the relevant Minister to construct soil conservation works when and where necessary.
Public Health Act no 36 of 1919	<ul style="list-style-type: none"> • Section 122 	<ul style="list-style-type: none"> • It is an offence to cause any form of a nuisance
Water Resources Management Act no 24 of 2004	<ul style="list-style-type: none"> • Section 56 	<ul style="list-style-type: none"> • No discharge of effluent may take place without a permit <ul style="list-style-type: none"> ○ Effluent is defined under this Act as any liquid discharge that occurs as a result of domestic, commercial, industrial or agricultural activities
Nature Conservation Ordinance no 4 of 1975	<ul style="list-style-type: none"> • Section 74 	<ul style="list-style-type: none"> • Protected plants may not be removed or damaged without a permit
Fertilizer, farm feeds, agricultural remedies and stock remedies act 36 of 1947	Section 9 and 18	To regulate or prohibit the importation, sale, acquisition, disposal or use of fertilisers, farm feeds, agricultural remedies and stock remedies.

ROLES AND RESPONSIBILITIES

It is the responsibility of NamPower to ensure that all management actions are carried out. The successful implementation of the EMP is, however dependant on clearly defined roles and responsibilities by several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during each phase of the project. The following roles and responsibilities have been identified as it pertains to this project:

1. Project Manager shall ensure that :

- Environmental requirements are adequately covered in the contract.
- Corrective action is identified for non-compliances or in the event of unforeseen environmental issues requiring environmental management action and that this is implemented.
- Appropriate records and information regarding compliance with environmental requirements are maintained.
- That the Contractor remains in compliance with the requirements of this EMP, through regular communication and monitoring.

- SHE requirements are included in the tender documents sent to the contractor.
- Information is provided on environmental performance to the contractor and relevant authorities when required.
- All site instructions are clearly communicated to the staff on site.
- Ongoing monitoring of the construction site is undertaken through regular site visits and record key finding. This includes photographic monitoring of the construction site.
- Keep appropriate records events and concerns of significance.

2. NamPower SHEW Section shall:

- Ensure that all requirements with regards to this EMP are fulfilled.
- Assist the Project Manager in ensuring the contractor remains in compliance with this EMP.
- Provide SHEW 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
- Audit the implementation of this EMP by the Contractor.
- Advise the Contractor on actions or issues impacting on the environment and provide appropriate recommendations to address these matters.

2. The Contractor shall:

- Be responsible for the implementation of the EMP.
- Ensure all tasks undertaken under the scope of work, are in accordance both with NamPower's SHEW policies and procedures as well as to the requirements of this EMP.
- Put in writing a system of communication, in which all incidents and accidents are reported to the SHEW section.
- Ensure that all employees receive a SHEW induction before the start of the project.
- Ensure that the work being done does not create a nuisance to any being working, residing or living on adjacent properties or within the immediate surroundings of the site.

Compliance with all requisite standard safety regulations will reduce the risk in terms of Occupational Health and Safety to acceptable levels. The significance of the impacts for construction activities forming part of the operational phase would be mitigated by the effective implementation of this operational EMP. The NamPower Safety Officers will assist in ensuring contractor compliance with the NamPower SHEW requirements regarding health and safety.

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

RECORDING AND REPORTING

The Environmentalist assigned by NamPower to the project, shall submit an environmental compliance report on a monthly or bi-monthly basis. These reports shall include a description of all activities on site, problems identified, non-conformances noted, and remedial action implemented.

Records relating to compliance monitoring shall be kept on site and will be made available for inspection by relevant competent authority which in this instance will be the Ministry of Environment and Tourism. Matters shall also be discussed during site meetings and project meetings.

ENVIRONMENTAL MANAGEMENT AND TRAINING

Before any work commences on site, the contractor shall ensure that adequate environmental awareness training of site personnel takes place and that all construction workers receive an induction presentation on the importance and implications of this operational EMP. The Contractor shall liaise with the Project Manager prior to the commencement date to fix a date and venue for the induction and to agree on the content.

The contractor shall provide a suitable venue and ensure that the specified employees attend the course. The contractor shall ensure that all attendees sign an attendance register.

As a minimum, training should include:

- Explanation of the importance of complying with this operational EMP,
- Discussion of the potential environmental impacts of construction activities,
- The benefits of improved personal performance,
- Employees' roles and responsibilities, including emergency preparedness,
- Explanation of the mitigation measures that must be implemented when carrying out their activities,
- Explanation of the specifics of this EMP and sensitive areas,
- Explanation of the management structure of individuals responsible for matters pertaining to the EMP.

The contractor shall keep records of all environmental training sessions, including names, dates and the information presented.

IDENTIFIED IMPACTS

One of the main purposes of the environmental assessment process which was carried out for this substation was to understand the significance of potential impacts associated with a proposed activity. Issues or impacts of less significance were screened out of the assessment process, with supporting reasons to ensure that the study focuses on the potentially "significant impacts" identified for the proposed site. Potentially significant impacts may be experienced in terms of waste (hazardous and general waste), air quality, noise and socio-economic aspects. It must be noted that no potentially significant impacts are anticipated since the proposed substations are located within an already environmentally disturbed area.

The following aspects were evaluated, and their impacts identified as follows:

- Social aspects
 - Introduction of contractors to work environment.
 - Nuisance to residents in nearby environment due to construction or maintenance
 - Improved energy supply
 - Employment opportunities
- Environmental aspects
 - Habitat destruction
 - Waste creation.
 - Erosion

OPERATIONAL PHASE EMP

The section below summarises the Operational EMP, for each component of the environment and details mitigation measures to achieve these objectives. Each objective is also tied to a responsible person. This section covers activities related to operation.

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
Environmental Awareness	Minimise the occurrence of environmental impact on the work and surrounding area.	<ul style="list-style-type: none"> • All staff to receive environmental awareness training and refresher environmental awareness training to be available when required. • The contractor shall erect and maintain information posters at key locations on site. • All staff are to be made aware of their individual roles and responsibilities in achieving compliance with the EMP. 	Project Manager and contractor
Construction site establishment	Ensure that environmental issues are taken into consideration in planning and construction of site establishment	<ul style="list-style-type: none"> • A method statement shall be provided by the contractor prior to any onsite activity which includes the layout of the construction camp in the form of a plan. • The plan should indicate the location of key infrastructure and services where applicable, including but not limited to offices, overnight vehicle parking areas, stores, stockpile, laydown area, hazardous material storage areas and placement of staff accommodation, cooking and ablution facilities, as well as waste and wastewater management . • Location of the camp must be carefully considered and approved by responsible NamPower Project Manager. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<ul style="list-style-type: none"> The contractor will not be allowed to camp on site. 	
No-Go areas	Operation related activities inside No-Go areas is prevented to avoid environmental impacts to such areas.	<ul style="list-style-type: none"> Areas outside the project area must be treated as no-go areas. Erect, demarcate and maintain temporary fence around perimeter of any no go area. Unauthorised access and construction related activity inside No-go areas is prohibited. 	Contractor
Access Road	Minimise impact on the environment through planned and controlled movement of vehicles on site	<ul style="list-style-type: none"> Maximum use of existing roads and tracks shall be implemented. 	Contractor
Waste water management	To avoid ,manage and mitigate potential impacts on the environment caused by wastewater during operation	<ul style="list-style-type: none"> Appropriate pollution control facilities necessary to prevent discharge of water containing polluting matter or visible suspended materials into watercourses or water bodies shall be designed and implemented. Runoff from the cement/concrete batching areas shall be strictly controlled and contained water shall be collected, stored, either treated or disposed of-site at a location approved by the Environmentalist. All spillages of oil onto concrete surface shall be controlled by use of approved absorbents material and the used absorbents material disposed of at an appropriate hazardous waste disposal facility. 	Contractor
Solid waste Management	To avoid ,manage and mitigate potential impacts on the environment caused by incorrect storage, handling and general disposal of general and hazardous solid waste.	<ul style="list-style-type: none"> Sufficient ,covered waste collection bins shall be provided onsite. Waste shall be segregated into separate bins and clearly marked for each waste type. Staff shall be trained in waste segregation. Bins shall be emptied regularly. General waste shall be disposed of at recognised and registered waste disposal sites/recycling companies. Hazardous waste shall be disposed of at a registered waste disposal site. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<ul style="list-style-type: none"> • Records should be kept of the type and quantity of waste disposed of at the waste disposal site. • Under no circumstances shall any waste be disposed of, burned or buried on site. • Unutilised construction materials may not be left or randomly strewn around the site but should be removed once construction has ended and. 	
Hazardous Substances	Minimise the risk of impact to the environment through safe storage, handling use and disposal of hazardous substances	<ul style="list-style-type: none"> • Drip trays must be available to contain accidental spills. • Machinery must be properly maintained to keep oil leaks in check. • All hazardous substance will be stored in suitable containers as defined in the method statement or Material safety data sheet (MSDS). • Containers should be clearly marked to indicate contents, quantities and safety requirements. • Use and /or storage of materials, fuels and chemicals which could potentially leak into the ground must be controlled in a manner that prevents such occurrences. • All storage areas should be bunded. The bunded area must be of sufficient capacity to contain a spill/leak from stored containers. • The contractor shall ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers. • The tanks /bowsers shall be situated on a smooth impermeable surface(concrete) bund. The impermeable lining shall extend to the crest of the bund and volume inside the bund shall be 130% of the total capacity of the storage tanks/bowser (110% statutory requirement plus an allowance for rainfall). • Adequate firefighting equipment shall be made available at all hazardous storage areas. • In an event of a spill , contaminated soil must be collected in containers and stored in a central location and 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<p>disposed of at an approved hazardous waste dumpsite.</p> <ul style="list-style-type: none"> • No smoking shall be allowed within the vicinity of the hazardous storage area. • Dirt drums shall be stored on a drip tray or within a bunded area. • Safe waste disposal certificates for hazardous waste shall be maintained. 	
Batching plant	Control concrete and cement batching activities to prevent spillage and contamination of soil, surface water and ground water	<ul style="list-style-type: none"> • Concrete mixing shall be carried out on an impermeable surface such as on boards or plastic sheeting or within a bunded area with an impermeable surface). • Bagged cement must be stored in an appropriate facility and at least 10m away from water drains. • Hardened concrete from washout facility or concrete mixer must be either reused or disposed of at an appropriate licenced disposal facility. • Any access sand, stone and cement must be removed from site on completion of the construction phase. • Ready mix concrete is encouraged. 	Contractor
Protection of Fauna	Ensure care is taken to minimise disturbance to fauna during operation	<ul style="list-style-type: none"> • The breeding sites of raptors and other wild birds species near the Substation should be avoided as far as possible. • If any bird nests are found, NamPower SHEW Section to be notified immediately. • Contact experienced snake catcher in the event snakes are spotted on site , do not attempt to catch or kill snakes. Contact Simon at 0812339242 or William at 0818904841,available 24 hours a day. • Report any incidents involving snakes to NamPower SHEW Section. 	Contractor and Project Manager
Protection of heritage resources	Prevent damage and destruction to fossils, artefacts and materials of heritage significance.	<ul style="list-style-type: none"> • Carryout general monitoring of excavation for potential fossils, artefacts and materials of heritage importance. • All work must cease immediately ,if any human remains or other archaeological chance find are 	Project Manager and contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<p>uncovered. Such materials must be reported to archaeologist so that a systematic and professional investigation can be undertaken.</p> <ul style="list-style-type: none"> NamPower SHEW Section must be notified immediately in the event of chance finds. 	
Safety of the public	Reasonable measures are taken to always ensure the safety of the public during operation.	<ul style="list-style-type: none"> Identify fire hazards, demarcate and restrict public access to the site. All unattended open excavations must be adequately fenced or demarcated. Maintain an incident and complaints register. 	Project Manager and Contactor
Sanitation	Supply suitably located ,clean and well-maintained toilet facilities to minimise the risk of disease and impact on the environment.	<ul style="list-style-type: none"> Mobile toilets are to be installed onsite if no other ablution facilities are available. No indiscriminate use of the veld for the purposes of ablutions shall be permitted. Ablution facilities shall be located within 100m of the work area. 	Contractor
Prevention of disease		<ul style="list-style-type: none"> Free condoms must be provided onsite at a central point. Ensure that the workforce is sensitised on the effects of sexually transmitted diseases, especially HIV AIDS. Information and education relating to sexually transmitted diseases to be made available to both construction workers. 	Contractor
Emergency procedure	Enable a rapid and effective response to all types of environmental, safety and health emergencies.	<ul style="list-style-type: none"> Updated emergency numbers to be readily posted on a notice board on site. NamPower Emergency Response Procedure is applicable and will be provided to contractor. 	Contractor
Increase in traffic and Safety and emergency situations	Minimise potential risk of injury and/or death to third parties.	<ul style="list-style-type: none"> The existing track will be used as an access route only. Access by third parties shall be recorded and all parties will be made aware of possible risks on site. Warning signs will be installed where necessary. Basic road safety behaviour for all contractors , NamPower employees and visitors, especially drivers, through training and awareness will 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<p>be undertaken. Typical issues include:</p> <ul style="list-style-type: none"> ○ Keeping to safe speed limit of 20km/h. ○ Ensuring that all drivers have valid licenses. ○ Making sure that all vehicles are roadworthy. ○ Zero tolerance for drinking and driving. ○ Using lights appropriately for visibility. <p>Road accidents are considered emergencies and will be handled in accordance with the NamPower's Emergency Response Procedure(s).</p>	
Noise from transportation activities	Manage increase in disturbing noise levels, nuisance and health impacts	<ul style="list-style-type: none"> • All noise generating activities will be kept to a minimum. • No traffic, unless in emergencies or if continuous pouring of concrete will be allowed, between sunset and sunrise. Concrete pouring activities should be planned such that they occur during the morning hours to avoid late night driving. • Operational activities will be limited to the daylight hours between sunrise and sunset to avoid undue noise disturbance. • Compliance with relevant standards, specifications and legislation concerning noise will be adhered to. 	Contractor
Dust and other air emissions	Manage increase in dust levels (nuisance & health impacts)	<ul style="list-style-type: none"> • Excavation, handling and transport of erodible materials shall be avoided under high wind conditions or when a visible dust plume is present. • Dust generation from all activities will be minimised wherever possible. • A maximum speed limit of 20 km/h will be enforced to control dust emissions and minimize incidents onsite. • Transport of construction material will ensure measures to prevent fugitive dust emissions. • Dust suppression measures shall be implemented if necessary. Dust may be controlled by damping of the road with water when necessary to minimise nuisance dust. 	Contractor

ASPECT	Management objective	MANAGEMENT AND MITIGATION MEASURES/COMMITMENTS	Responsible person
		<ul style="list-style-type: none"> Machinery and equipment will be maintained in good working order in order to minimise exhaust fumes. 	
Herbicide Application	Minimize water and soil pollution	<ul style="list-style-type: none"> Herbicide application should be undertaken by trained applicators under the supervision of an employee 	Contractor and NamPower
Site Rehabilitation	Minimize visual and ecological pollution	<ul style="list-style-type: none"> Rehabilitate all features, infrastructure associated with the operational phase that is not in use. All areas disturbed by any operational activities shall be subjected to rehabilitation. All spoil and waste will be removed to a registered waste site and certificate of disposal provided. All equipment used as part of operation to be removed from site. 	Contractor

NON-COMPLIANCE PROCEDURES DURING OPERATIONS

NamPower Regional Manager (Central), Area Superintendent and District Supervisor shall ensure that the requirements outlined in this EMP is implemented and enforced during the operation of the Tamarisk Substation.

ENVIRONMENTAL MONITORING AND AUDITING

Environmental monitoring must be conducted at least once every month when operational activities are underway. Benefits derived from the monitoring and final audit process might include:

- identification of environmental risk;
- development or improvement of the environmental management system;
- avoidance of financial and time loss;
- avoidance of legal sanctions;
- increase in staff awareness;
- identify potential cost savings;

Commonly, the environmental monitoring or audit of a site will cover all management procedures, operational activities & systems, and environmental issues and will be carried out by the NamPower SHEW section.

DOCUMENTATION, RECORD KEEPING AND REPORTING PROCEDURES

It is vital that an appropriate document handling and retrieval system be developed for all EMP documentation. This will ensure that there is adequate EMP documentation control and will facilitate easy document access and evaluation. EMP documentation must include:

- EMP implementation activity specifications;
- Induction records;
- site inspection reports; and
- monitoring reports;

Responsibilities must be assigned by the NamPower responsible persons/contractor to relevant personnel for ensuring that this operational EMP documentation system is maintained and that document control is ensured through access by and distribution to, identified personnel.

Document control is important for the effective functioning of any EMP. A document handling system must be established to ensure adequate control of updating and availability of all documents required for the effective functioning of the EMP. This procedure applies to the EMP as well as procedures and policies relating to the EMP, which must be controlled (i.e. identified, registered and changes recorded).