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PROPOSED ESTABLISHMENT OF A TOWNSHIP ON PORTION 35/737 WITHIN TSUMEB TOWNLANDS



ENVIRONMENTAL MANAGEMENT PLAN
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ABBREVIATIONS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
MET	Ministry of Environment and Tourism
SM	Site Manager
TEC	Tortoise Environmental Consultants



1 OVERVIEW

This document constitutes an Environmental Management Plan (EMP) to manage activities during establishment of a township on Portion 35/737 within Tsumeb townlands. The upsurge in industrial development within and around central Northern District has necessitated the need to provide more facilities for the inhabitants and job seekers. The Tsumeb Municipality has therefore identified Portion 35/737 as a suitable site to establish the needed township that will be composed of various amenities and will be known as Extensions 19 - 21 respectively

Tortoise Environmental Consultants (TEC) was appointed to undertake the requisite EIA study to investigate the potential biophysical and socio-economic impacts that the proposed development would cause including drafting of this Environmental Management Plan (EMP). The EMP is submitted to the Department of Environmental Affairs (DEA) of the Ministry of Environment and Tourism (MET) as part of the application for the Environmental Clearance Certificate (ECC). The contents of the EMP will be binding to all parties that will have a role to play in the design, construction, and operation of the township as relevant to the roles played.

1.1 PURPOSE OF THE EMP

The EIA process comprised a full Scoping process that included an assessment of all potential environmental impacts as identified through the process. Section 8 (j) of the EIA Regulations requires that a draft EMP be submitted as part of the Scoping Report so that these documents can be considered by MET:DEA simultaneously.

The 2012 EIA Regulations define a 'management plan' as:

"...a plan that describes how activities that may have significant environments effects on the environment are to be mitigated controlled and monitored."

This EMP has there been included in the Scoping Report to provide a link between the impacts identified in the EIA Scoping Process and management thereof during project implementation and operation where applicable. The EMP aims to align and optimise environmental management with any conditions of the environmental clearance, thereby ensuring that the identified considerations are efficiently and adequately taken into account during all stages of developing the site. The contents of the EMP also includes a system for assessing the effectiveness of monitoring and management arrangements after implementation. The Proponent therefore has the responsibility to ensure that the proposed development conforms to the principles of EMA and must ensure that any contractors appointed by them also comply with such principles. Copies of the EMP shall be distributed to all senior project personnel and they shall be required to familiarize themselves with the contents of this document.



2 PROJECT INFORMATION

The increased demand for residential structures is of national concern and the town of Tsumeb has not been spared from this predicament. The upsurge in industrial development within and around central Northern District has necessitated the need to provide more facilities for the inhabitants and job seekers. The Tsumeb Municipality has therefore identified Portion 35/737 as a suitable site to establish the needed township that will be composed of various amenities. The township will be subdivided into two extensions that will be known as Extensions 19 - 21 respectively. It is expected that an access road will form part of the associated services including internal network of streets. The township would be provided with municipal services such as sewerage, water, storm water and electrical networks. Where necessary, additional drifts and culverts will also be allocated at strategic areas. The tables below present the different land uses and erf sizes in the two extensions.

Table 2-1 | Proposed land uses and erven sizes for Extension 19

Land uses	Number of erven	Total erven size in hectares
Residential 1	206	17.01
Residential 2	11	2.89
Business	3	0.48
Hospitality	1	0.77
Institutional	2	2.98
Private Open Space	1	10.08
Public Open Space	6	3.34
Streets	<i>Remainder</i>	11.53
Total	231 & remainder	49.08

Table 2-2: Proposed land uses and erven sizes for Extension 21

Land uses	Number of erven	Total erven size in hectares
Residential 1	218	17.85
Residential 2	14	4.43
Business	9	2.99
Offices	7	2.69
Institutional	6	29.82
Public Open Space	18	6.07
Streets	<i>Remainder</i>	22.00
Total	272 & Remainder	85.85

Two access roads (Access A & Access B) were identified as proposals for access to the two extensions. Roads Authority has approved Access A which will serve a crossing of Trunk Road 1501 between the eastern and western parts of Tsumeb.



There are a number of permits that may require prior approval for the project to be executed. Some of these have already been applied for and approval has been obtained as indicated in Table 2.3 below.

Table 2-3: Permits and special requirements required for the project

Aspect of project	Permits and special requirements required	Status
Ecology	Permit for the removal of protected plant species	To be applied for from Ministry of Environment and Tourism by the Municipality and this permit must be obtained prior to commencement of clearance activities.
Compliance	Designate an Official to maintain compliance of activities	Tsumeb Municipality to second an official that will act as an Site Manager for the project
Traffic and roads	Obtain authorisation from Roads Authority to construct access roads	Access to the site was Applied for from the Roads Authority and approval has been issued for Access Route A. Authorisation would still be required for the internal routes in the extensions.
Social-economic	Local recruitment policy, induction and awareness programme	To be compiled by Tsumeb Municipality during prior to appointing a contractor and should be implement by the contractor with supervision by the municipality.

It should be noted that detailed designs for all the facilities to be established in the two extensions is usually undertaken as part of the pre-construction phase. This is a costly undertaking which is generally only costed once all required authorisations have been obtained. Thus, the planning and design aspects discussed herein are limited to those associated with the pre-authorisation phases, but recommendations may be made for detailed design. Figure 1 and 2 overleaf presents the locality of the proposed Extension 19 & 20 as well as the layout design of the facilities.





Figure 1: Map showing the location of the two proposed Extensions 19 & 20





Figure 2: Google map indicating the layout of the extensions, note the proposed Access routes labelled as A and B



2.1 MITIGATION MEASURES

A number of recommendations have been identified for consideration and adherence during the development of the township. In order to achieve the intended objectives, the recommended mitigation measures are to be implemented in conjunction with best-practice guidelines. These are listed below and have been included in the implementation table.





2.1.1 Ecology

The Ecological Assessment that was conducted on the proposed development area established that some bush clearance would need to be undertaken to enable servicing of the land. The site is however rich in plant diversity some of which are protected plant species. The following mitigation measures are therefore recommended to reduce the impact on the biophysical environment:

- Before commencement of the bush clearing activities, identify and mark (e.g. with red and white tape) protected and unique plant species (i.e. *Terminalia prunoides*, *Sclerocarya birrea*, *Berchimia discolor*, *Spyrostachys africanum*, *Combretum apiculatum*, *Commiphora glaucescens* and *Kirkia acuminata*, these species should be avoided as far as possible;
- All other trees that are > 5m in height or with a diameter of 150 mm must not be removed if they are not affecting development (erven) and be left to complement the aesthetics of the development;
- Prohibit the capturing/killing of birds and other fauna such as tortoises etc;
- Prevent or ensure that fire do not spread from the construction site as this could lead to loss of life, property and grazing for neighbouring landowners and associated problems;
- Remove and relocate unique flora species e.g. various Aloe species from the development area. A permit must be applied for the relocation of such species and permit conditions must be adhered to. Such species could also be reintroduced and incorporated into the overall landscaping of the site;
- Prohibit the use of herbicides in the area;
- Upon completion of construction, rehabilitate disturbed areas as soon as possible.



Table 2-4: Snapshots of the protected plant species that should not be removed from the project area

 <p><i>Kirkia acumiata</i> commonly known as mountain kirkia, bergsering, Omulemba</p>	 <p><i>Spirostachys Africana</i> commonly known as Tamboti, Tambotie, Omuhongo</p>
 <p><i>Peltophorum africanum</i> commonly known as African wattle, Huilboom, Omupalala</p>	 <p><i>Moringa ovalifolia</i> commonly known as Phantom tree, Sprokiesboom, Omutindi</p>

2.1.2 Water Resources

It is anticipated that the township development will have an influence on the natural drainage and flow of surface water in the area. The alterations will result in an increase of surface water runoff due to the change in permeability characteristics. However, all services are expected to be constructed as per the general municipal standards. The following measures are recommended:

- Construct sufficient drainage structures that have been included in the design at the same time as the main civil works in order to minimise the effects of storms during construction.
- Prevent the disposal of rubble, sand and waste material resulting from the construction activities into drainage channels as this will impede flow in these channels.
- Ensure that stormwater structures are visually monitored after large rainfall events to ensure that blockages or eroded areas do not develop.



2.1.3 Socio-economic Aspects

It is anticipated that, jobs will be created in the immediate and surrounding project area depending on the recruitment practices as well as the ease with which the construction contractor will be able to identify and recruit suitably skilled locals. The project may also lead to indirect job creation such as jobs from refuse removal and security services for the business facilities to be established. It is further expected that a limited number of employees will be required to provide indirect services in the operation of the institution and business facilities. The increase in employment opportunities could also lead to an increase in HIV prevalence as well as gender based violence. It is therefore highly recommended that all site staff must undergo an induction on HIV, alcohol abuse as well as gender based violence.



3 ROLE PLAYERS & THEIR RESPONSIBILITIES

This section outlines the roles and responsibilities of the respective key personnel that would be responsible for effective implementation of the EMP during mining activities as well as during site closure.

3.1 ROLES AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key procedures are followed. The purpose of this section is to define roles for personnel and to detail their respective responsibilities in the execution of the EMP. The key role-players for the project are the Environmental Compliance Officer (ECO) representing MET – DEA for environmental monitoring, the Site Manager (SM) that will be seconded by the Tsumeb Municipality and the Contractor to be responsible for the ground team and do the actual work. It is recommended that an organisational structure be developed to ensure that:

- There are clear channels of communication;
- There is an explicit organisational hierarchy for the project; and
- Potential conflicting or contradictory instructions are avoided from either side.

All instructions and official communications regarding environmental matters shall follow the organisational structure as determined by the Municipality (Proponent). In terms of the recommended organisational structure, all instructions that relate to environmental matters should be communicated to the Municipality via the Site Manager. The only exception to this rule would be in an emergency (defined as a situation requiring immediate action and where failure to intervene timeously would, in the reasonable opinion of the Site Manager result in unacceptable environmental degradation).

The Contractor:

The Contractor will be responsible for the actual operations of the site and shall be responsible for ensuring the day-to-day implementation of the EMP during the lifecycle of the development phases of the extensions, and shall be well-versed in the contents of this document:

- The Contractor shall liaise closely with the Site Manager on any environmental management issues, incidents or emergencies onsite.
- The Contractor shall ensure that the works on-site are conducted in an environmentally sensitive manner and in accordance with the requirements of the EMP at all times. Special care shall be taken to prevent irreversible damage to the environment.
- The Contractor shall ensure that all work areas are confined within the parameters of the development area, and that all associated equipment are located in a manner that complies with the requirements of this EMP.



- The Contractor shall ensure that all site staff are adequately informed of the requirements of the EMP pertaining to their roles onsite, and that they have attended an environmental induction training session (this session must be in the form of an on-site talk and/or a written code of conduct that is clearly explained to and understood by the entire team).

The Site Manager:

The Site Manager in the context of this document refers to the party responsible for overseeing the mining site activities, including the site preparation phase, the mining operational phase, the rehabilitation phases and the closure of the mining site. The Site Manager should preferably be an employee or a representative of the Proponent.

- The Proponent shall appoint a Site Manager to oversee the daily onsite activities.
- The Proponent shall ensure that the mining site is rehabilitated appropriately in accordance with the requirements of this EMP

The Environmental Compliance Officer (ECO):

The ECO in the context of this document refers to the party responsible for the environmental compliance and auditing activities required by the EMP for the lifecycle of the mining activities. The ECO shall be appointed by MET, and the designation shall be reserved for a suitably qualified and independent environmental manager. The ECO shall have adequate environmental knowledge to understand the detailed environmental issues associated with the project, and is to be well versed in the contents of the EMP and its associated reports:

- The ECO shall undertake all monitoring and auditing activities to ensure compliance with the EMP.
- The ECO shall compile General Progress Reports following any site inspections (including progressive rehabilitation inspections), Compliance Reports following any non-compliance, and a Closure Report following the conclusion of mining and eventual closure of the site.
- The ECO shall liaise closely with the Site Manager, Contractor and shall provide guidance on any environmental management issues, incidents or emergencies that are brought to their attention.
- The ECO shall assist in providing recommendations for remedial action in the event of any non-compliance.

3.2 COMPLIANCE WITH REQUIREMENTS

Environmental management is not only concerned with the final results of developing the township, but it is also concerned with how such operations are carried out. Tolerance with respect to environmental matters applies not only to the finished product but also to the standard of the day-to-day operations required to complete the proposed project works.



The development of an EMP for a project is an important and necessary task that is aimed at assigning responsibilities and mitigation options to a variety of activities. However, in the absence of auditing or monitoring activities the EMP will be ineffective. Auditing or monitoring activities involve the structured observation, measurement, and evaluation of environmental data over a period of time. The overall responsibility to ensure that the EMP is implemented rests with the Tsumeb Municipality, who shall appoint appropriate engineering, environmental and contracting teams to undertake the work in a responsible manner. The ECO shall inspect the site at regular intervals during the various phases of the mining process and shall report on the level of compliance with this EMP to MET.

3.2.1 Disciplinary Action

The EMP is a legally binding document. Non-compliance with the EMP shall result in MET taking disciplinary action against the perpetrator/s. Such action may take the form of (but is not limited to) financial penalties, legal action, fines, and/or suspension of work.

The Proponent shall be deemed to have not complied with the EMP if:

- There is evidence of contravening the EMP and environmental damage ensues due to negligence.
- The Municipality fails to comply with corrective or other instructions issued by the ECO or MET within a specified time.
- The Municipality fails to respond adequately to public complaints.

The disciplinary action shall be determined according to the nature of the non-compliance or crime, and exact penalties are to the discretion of the ECO and MET-DEA according to the severity of the incident.

Measures to be implemented and overseen by the Site Manager; and monitored by the ECO during the mining activities are outlined in the following table:



Table 3-1: Management activities to be implemented during mining operations and rehabilitation process of the Mining Claims

Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
Communication with the Contractor and staff	To ensure effective and formal communication between the Project Team on any issues throughout all stages of the project.	The contact details of the Site Manager must be available to all relevant parties.	Project term (from site establishment to completion)	Records of correspondence	All
		All contractors and/or employees must be fully aware of the environmental management requirements detailed in this EMP.		No avoidable environmental impacts occurring due to miscommunication	
		The Site Manager and ECO must be notified immediately should environmental issues arise.		The ECO is aware of <i>ad-hoc</i> decisions taken by the Site Manager and Contractor.	
Staff induction training and code of conduct	To ensure that staff is familiar with the management requirements for the site and behave in an environmentally conscious manner.	All workers must undergo induction training. The induction training must cover environmental awareness, protection of flora and fauna, SHE measures and training in safe construction.	Project term	Signed induction attendance register	Contractor and Site Manager
		Staff operating equipment (such as loaders, etc.) shall be adequately trained and sensitised to any potential hazards associated with their tasks.			
	Punitive measures and incentives for	Proponent to adopt a disciplinary system to address common, minor	<i>Ad hoc</i>	A reduction in the number of fines	Contractor/ ECO



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
	Proponent's staff	health and safety misdemeanours of individual staff, such as littering, not using ablution facilities and illegal collection of specimen.		issued daily	
Road safety and traffic control	To ensure that increased traffic volume is managed efficiently	Access road entrances must be demarcated, both at their exit point from the existing roads and the entry point to the project site.	Contract term	Public complaints and non-compliance register	Site Manager and ECO
		Erect signage to warn motorists about construction activities and the presence of heavy vehicles.			
		Speed limit for heavy construction vehicles shall be restricted to 30km/h.			
Socio-economic	To promote benefits to local inhabitants whilst preventing negative impacts	Maintain a fair and transparent local recruitment policy. Implement HIV/AIDS awareness and prevention programme. Maintain clear identification of construction workers.	Project term	Contribute to employment and capacity building in the local community. Creating awareness amongst employees and the public.	Contractor
Dust Control	To avoid nuisance impacts caused by dust as far as possible	All reasonable measures shall be taken to minimise the generation of dust. If dust will be experienced as a nuisance, then dust suppression measures shall be implemented on site.	Project term	Physical verification, record of non-compliance	Contractor / Site Manager



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
Visual quality	Although the construction activities might affect the natural scenery, further visual disruption should be avoided	Demarcate all working areas and contain all activities within the working area.	Project term	Physical verification and routine monitoring	Contractor / Site Manager
		Appropriate signage and information posters to be prominently displayed and maintained to warn about the presence of heavy vehicle movement where appropriate.			
		Remove all litter from the site and rehabilitate all impacted areas appropriately.			
Site demarcation	To limit the spatial extent for the project activities	Unless otherwise agreed to, the Site Manager shall ensure that all project activities are restricted within the defined Working Area. The areas outside of the defined Working Area shall be regarded as exclusion areas and no unauthorised entry, dumping or storage of materials shall be allowed within the exclusion areas.	Project commencement	Physical verification and routine monitoring	Site Manager / ECO
Ablution facilities	Reduce health risks and environmental pollution arising from the concentration of human excreta in	Ensure adequate ablution facilities for project staff. Acts of excretion and urination, other than at the facilities provided, must be strictly prohibited.	Project term / daily / <i>ad hoc</i>	Physical verification and routine monitoring	Site Manager / ECO



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
	the environment	All ablution facilities are to be inspected on a regular basis to ensure the above requirements are being met.			
Heritage Resources	To ensure that no potential buried heritage resources are disturbed or destroyed during construction	Recovery of heritage remains or artefacts discovered and their removal must be directed by the National Museum (+264 61 276800) or National Forensic Laboratory (+264 61 240461).	Project term	Physical verification	Site Manager / ECO
		No artefacts must be removed or be interfered with prior to authorisation from the Namibian National Heritage Council (NHC).			
		Mitigation must involve the scientific recording or collection of such artefacts.			
Protection of ecological resources	To prevent unnecessary disturbance to flora and fauna	Prevent and discourage the setting of snares (poaching), indiscriminate killing of perceived dangerous species (e.g. snakes, tortoises etc.) in and surrounding the project area.	Project term	Physical verification	Site Manager, ECO
		Locate internal roads to avoid the removal of bigger trees (especially protected species [Forestry Act No. 12 of 2001]).			
		Identify and mark (e.g. with red and white tape) protected and unique plant species (i.e. <i>Terminalia prunoides</i> , <i>Sclerocarya birrea</i> ,			



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
		<p><i>Berchimia discolor</i>, <i>Spyrostachys africanum</i>, <i>Combretum apiculatum</i>, <i>Commiphora glaucescens</i> and <i>Kirkia acuminata</i> before the commencement of construction activities.</p> <p>All trees that are > 5m in height or with a diameter of 150 mm must not be removed if they are not affecting development (erven) and be left to complement the aesthetics of the development.</p> <p>Prevent or ensure that fire do not spread from the construction site as this could lead to loss of life, property and grazing for neighbouring landowners and associated problems.</p> <p>Remove and relocate unique flora species e.g. various Aloe species from the development area. A permit must be applied for the relocation of such species and permit conditions must be adhered to. Such species could also be reintroduced and incorporated into the overall landscaping of the site.</p> <p>Avoid the use of herbicides in the area.</p>			



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
		Incorporate indigenous vegetation especially the protected species – i.e. <i>Moringa oleifera</i> individuals.			
Water Resources	To prevent disruptions to water resources	<p>Educate and inform contractors on environmental issues contained herewith prior to development and monitor compliance thereof throughout the project phase.</p> <p>Construct the drainage structures that have been included in the design at the same time as the main civil works in order to minimise the effects of storms during construction. Maximize the number of road culvert barrels.</p> <p>Prevent the disposal of rubble, sand and waste material resulting from the construction activities into any water stream and or drainage channels as this will impede flow in these channels.</p> <p>Ensure that stormwater structures are visually monitored after large rainfall events to ensure that blockages or eroded areas do not develop.</p>	Project term	Physical verification	Site Manager / ECO
Rehabilitation	To ensure that all disturbed areas are	All areas disturbed as a result of the development activities within the	completion of construction phase	Physical verification and routine	Site Manager / ECO



Aspect	Management Objective	Management Action	Action Frequency	Indicator / Data Source	Party responsible for implementation
	rehabilitated to facilitate recovery to natural state	defined Working Area, shall be subject to the requirements outlined in this EMP. Ensure proactive rehabilitation by site staff through appropriate communication and training.		monitoring	
	Demolition and removal of structures	Prior to landscaping, the Proponent shall demolish and remove from Site everything not forming part of the finished structures.			



4 CONCLUSION

The EMP has identified the approaches with which to manage the activities pertaining to the development of the proposed Extensions 19 - 21 respectively. The aim of the EMP is also to ensure legally compliant and environmentally acceptable rehabilitation measures of the impacted areas as well to ensure that protected plant species are handled accordingly.

The compilation of the EMP has incorporated the identified impacts and mitigation measures with consideration of principles for best practice in terms of environmental management. The effective implementation of this EMP will ensure that the project will be delivered in the most environmentally safe manner. It is therefore recommended that an Environmental Control Officer and a suitably experienced Site Manager monitors the vegetation clearance and construction activities so as to ensure that the mitigation and rehabilitation measures described in this report are adhered to. The EMP must be regarded as a living document and changes must be made to the EMP as required by project evolution, while retaining the underlying principles and objectives on which the document is based.

