



## Environmental Management Plan

In Support of an Application for an

## Environmental Clearance Certificate

For the Upgrading of Tourist Road C38 to a Low-Volume Sealed Road in  
Etosha National Park, Etosha, Oshikoto Region

October 2023

Application Reference No. **APP-002464**

Project Engineers :



Prepared by :



**PROJECT TITLE NAME**

An Environmental Management Plan (EMP) Prepared in Support of an Application for an **Environmental Clearance Certificate** (ECC) for the Upgrading of the Tourist Road to Low-Volume Sealed Road in Etosha National Park

**APPLICATION REFERENCE NO.**

**APP-002464**

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## ABBREVIATIONS AND ACRONYMS

|                |   |  |
|----------------|---|--|
| BAT            | - | Best Available Technology                      |
| CIP            | - | Consumer Installation Permit                   |
| dba            | - | Decibels                                       |
| DPTS           | - | Department of Planning and Technical Services  |
| EC             | - | Environmental Commissioner                     |
| ECC            | - | Environmental Clearance Certificate            |
| ECO            | - | Environmental Control Officer                  |
| EIA            | - | Environmental Impact Assessment                |
| EMP            | - | Environmental Management Plan                  |
| ENP            | - | Etosha National Park                           |
| ERP            | - | Emergency Response Plan                        |
| GPS            | - | Global Positioning System                      |
| GRN            | - | Government of the Republic of Namibia          |
| ha             | - | hectare (1 ha = 10 000 m <sup>2</sup> )        |
| HPP            | - | Harambee Prosperity Plan                       |
| IAPs           | - | Interested and Affected Parties                |
| KNG            | - | King Nehale Gate                               |
| LDV            | - | Light Duty Vehicle                             |
| m <sup>2</sup> | - | square meters                                  |
| MAWLR          | - | Ministry of Agriculture, Water and Land Reform |
| MC             | - | Main Contractor                                |
| MEFT           | - | Ministry of Environment, Forestry and Tourism  |
| MHSS           | - | Ministry of Health and Social Services         |
| MME            | - | Ministry of Mines & Energy                     |
| NCCI           | - | Namibia Chamber of Commerce and Industries     |
| NHC            | - | National Heritage Council                      |
| NSI            | - | Namibia Standards Institute                    |
| PE             | - | Project Engineers                              |
| PPE            | - | Personal Protective Equipment                  |
| RFA            | - | Road Fund Administration                       |
| SHE            | - | Safety, Health & Environment                   |
| SME            | - | Small and Medium Enterprises                   |
| TCE            | - | Tulipamwe Consulting Engineers                 |
| WAP            | - | Water Abstraction Permit                       |

## DEFINITION OF TERMS

|  |  |
|--|--|
| <b>Alien Species</b>                       | A plant or animal species introduced from elsewhere: neither endemic nor indigenous  |
| <b>Alien Vegetation</b>                    | Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to all declared and listed invader species as set out in the Conservation of Agricultural Resources Act regulations  |
| <b>Alternatives</b>                        | Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, processes or technology alternatives, temporal alternatives or the 'do nothing' alternative.   |
| <b>Construction Activity</b>               | Any action taken by the contractor, his/her subcontractors, suppliers or personnel during the construction process.  |
| <b>Construction Phase</b>                  | The phase of a project which precedes the Operational Phase, during which project facilities and infrastructure are assembled and installed on their foundations, and connected and tested, to ensure that they operate as designed.   |
| <b>Cumulative Impacts</b>                  | Impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (e.g. discharges of nutrients and heated water to a river that combine to cause algal bloom and subsequent loss of dissolved oxygen that is greater than the additive impact of each pollutant). Cumulative impacts can occur from the collective impacts of individual minor actions over a period and can include both direct and indirect. |
| <b>Direct Impacts</b>                      | Impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (e.g. noise generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.  |
| <b>Ecosystem</b>                           | Is a dynamic system of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit.   |
| <b>Emergency Plan</b>                      | An emergency plan is a plan in writing that, on the basis of identified potential incidents at the installation together with their consequences, describes how such incidents and their consequences should be dealt with, both on site and off site.   |
| <b>Environment</b>                         | The surroundings within which humans exist and that are made up of: <ul style="list-style-type: none"> <li>(a) The land, water and atmosphere of the earth;</li> <li>(b) Micro-organisms, plant and animal life;</li> <li>(c) Any part or combination of (a) and (b) and the interrelationships among and between them; and</li> <li>(d) The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being</li> </ul>   |
| <b>Environmental Component/Aspect</b>      | An attribute or constituent of the environment (i.e. air quality; waste management, seismicity, soil, groundwater; terrestrial ecology, noise, traffic, socio-economic) that may be impacted by the proposed project.  |
| <b>Environmental Management Plan (EMP)</b> | A working document which contains site specific plans to ensure that environmental management practices to eliminate and control environmental impacts are followed during the developmental phases of that site, project and or facility and would normally consist of construction phase, operational phase and decommissioning phases.  |
| <b>Environmental Monitoring</b>            | Means collection, evaluation and summarization of environmental data by continuous or periodic monitoring of certain qualitative and quantitative indicators characterizing the state of environmental components and their modification as a result of the impact of natural and anthropogenic factors.   |

|   |  |
|---|--|
| <b>General Waste</b>                          | Waste that does not pose an immediate threat or hazard to health or the environment: domestic waste; business waste and inert waste.   |
| <b>Habitat</b>                                | The place in which a species or ecological community occurs naturally  |
| <b>Hazardous Waste</b>                        | Waste that has the potential to cause a negative threat/impact to humans and/or the environment. It includes, but is not limited to, batteries, neon lights, fluorescent lights, printer cartridges, oil, paint, paint containers, oil filters, IT equipment etc.  |
| <b>Indirect Impacts</b>                       | Indirect or induced changes that may occur as a result of the activity (e.g. the reduction of water in a stream that supply water to a reservoir that supply water to the activity). These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.  |
| <b>Industrial Waste</b>                       | Means waste generated as a result of business, commerce, trade, wholesale, retail, professional, manufacturing, maintenance, repair, fabricating, processing or dismantling activities, but does not include domestic waste, garden or bulky waste, builders' waste or health care risk waste.   |
| <b>Interested and Affected Parties (IAPs)</b> | Interested and affected party: Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.   |
| <b>Major Incident</b>                         | A major incident is an occurrence of catastrophic proportions, resulting from the use of a plant or machinery or from activities at a workplace. When the outcome of a risk assessment indicates that there is a possibility.  |
| <b>Mitigation</b>                             | Measures designed to avoid, reduce or remedy adverse impacts.  |
| <b>Non-compliance</b>                         | Issues that are in direct non-compliance with the requirements, commitments and/or management measures as approved in the EMP.   |
| <b>Pollution</b>                              | A change in the environment caused by substances (radio-active or other waves, noise, odours, dust or heat emitted from any activity, including the storage or treatment or waste or substances.   |
| <b>Sensitive Area</b>                         | A sensitive area or environment is described as an area or environment where a unique ecosystem, habitat for plant and animal life, wetlands or conservation activity exists or where there is high potential for ecotourism   |
| <b>Significant Impact</b>                     | An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.   |
| <b>Waste</b>                                  | Means<br>(a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or<br>(b) disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered.<br>(c) (c) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste.<br>(d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks. |
| <b>Watercourse</b>                            | Means -<br>(a) a river or spring;<br>(b) a natural channel in which water flows regularly or intermittently;<br>(c) a wetland, lake or dam into which, or from which, water flows; and   |

# 1 INTRODUCTION

## 1.1 Project Overview

The Ministry of Environment Forestry and Tourism (MEFT) which is responsible for the management and maintenance of all national parks, is proposing to upgrade one of the main tourist road in Etosha National Park (ENP). Proclaimed a national park on 22 March 1907 and currently covering a geographical area of 22 917 km<sup>2</sup>, ENP is ranked as one of the oldest parks in the world and by all accounts the first on the African continent.

MEFT is proposing to improve road infrastructure within the park so as to enhance accessibility, service delivery and to reduce dust which is undesirable and a safety hazard on the main gravel road. Dust affects visibility significantly and can result in highly unsafe following and passing conditions especially during windy conditions. Ongoing maintenance of gravelled roads in the park is also becoming unsustainable given the fiscal challenges experienced by government.

The proposed development is a listed activity for which an Environmental Clearance Certificate (ECC) is a statutory requirement. In this connection, Tulipamwe Consulting Engineers (hereinafter, **TCE** or **Tulipamwe**), who are the project manager, have appointed Ekwao Consulting (**Ekwao**) to undertake the environmental services required in order to obtain the aforesaid ECC.

This report is the Environmental Management Plan (EMP) and has been prepared in terms of the Environmental Management Act (Act No. 7 of 2007) (EMA) and related EIA Regulations

## 1.2 Upgrading of Tourist Roads

The proposal is to upgrade the main gravel route through the park to a low-volume sealed road. Essentially, C38 is the route which starts from C39 at Outjo, entering ENP at Anderson Gate, providing access to the main three oldest rest camps - Okaukuejo, Halali and Namutoni and exiting the park at King Nehala Gate (KNG), where it joins the B1 trunk road (Figures: 1 & 2)

The plan is to start the upgrade from Okaukuejo and proceed all the way up to KNG – a total length of 215. The travel width of C38 within the park is about 8 m. The upgrade will therefore have an approximate footprint of 172 ha. The road has been divided into six sections with their respective lengths as shown in **Table 1**, below.

**Table 1:** Sections of the C38 to be Upgraded

| Road Section | Length (km)  | Duration  |
|--------------|--------------|---|
| Section A    | 42.2         | The development will be in phases over a period of 60 months. |
| Section B    | 38.0         |   |
| Section C    | 39.5         |   |
| Section D    | 34.3         |   |
| Section E    | 60.6         |   |
| Total        | <b>214.5</b> |   |

The construction will be done in phases over a period of sixty (60) months. From Okaukuejo, the road transects through six vegetation types proceeding in a southern east direction (Fig.2). The upgrade does not involve the construction of bridges because the road does not cross any significant rivers.



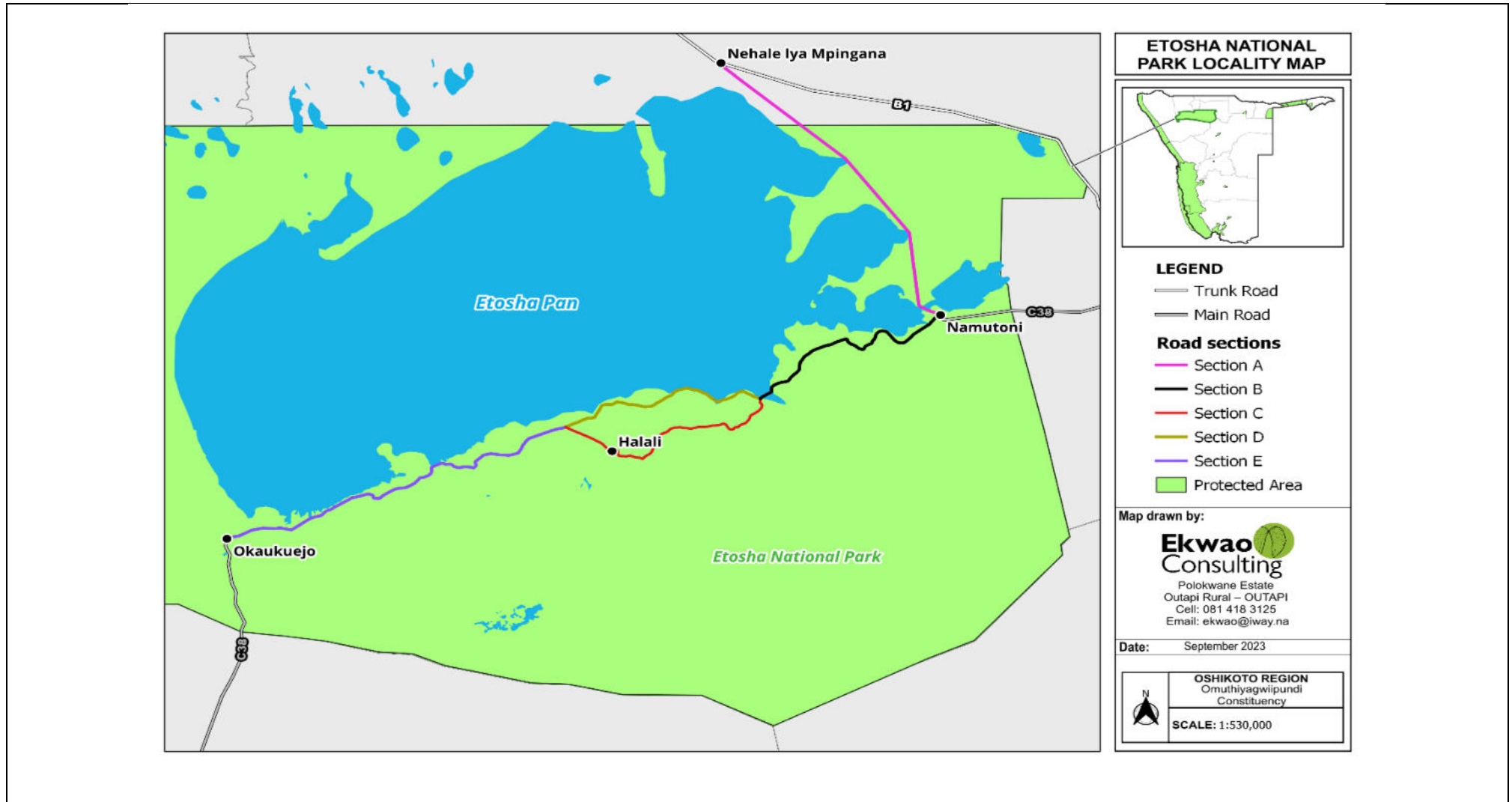


Figure 1: Project Location



Figure 2: View of C38 from Okaukuejo to KNG

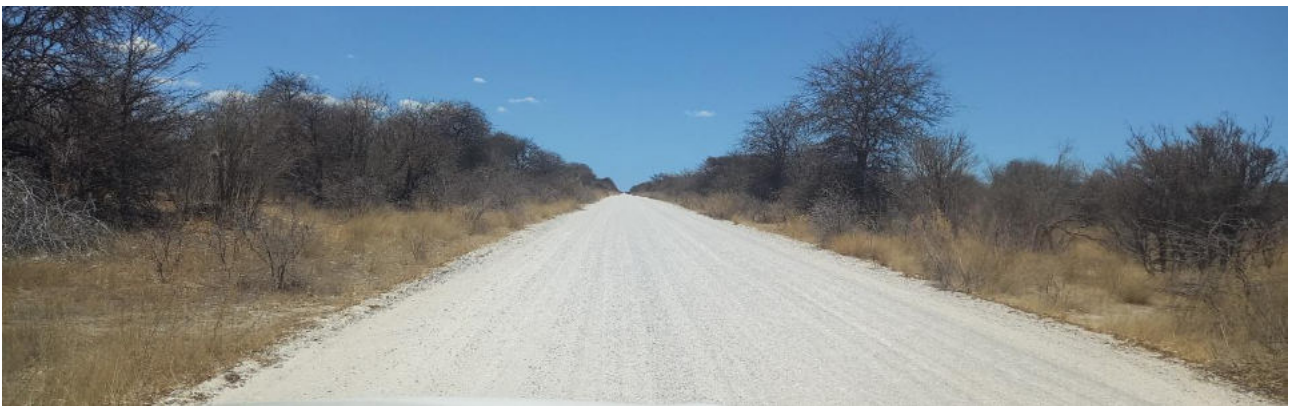


Figure 3: C38 passing through a woodland section of the park



Figure 4: C38 passing through shrubland section of the park

### **1.3 Purpose of the EMP**

The purpose of this EMP is to formulate mitigating measures that should be made binding to all contractors and suppliers during the construction of the proposed development, as well as measures that should be implemented post construction. The point of departure for this EMP is to take a pro-active route by addressing potential problems before they occur. The EMP will also provide management responses that will ensure that the impacts of the development are minimised. This should limit corrective measures needed during the construction and operational phases of the development.

Additional mitigation will be included throughout the various phases of the development as and when such measures became necessary. This EMP is therefore a stand-alone document, which must be used on site during each phase of the development (planning, construction and decommissioning)

The EMP must be disseminated and used by the contractor hired to carry out the upgrades as well as to any third parties providing services to the contractor including any subcontractors. Any parties responsible for transgression of the underlying management measure outlined in this document will be held responsible for non-compliance and will be dealt with accordingly.

### **1.4 Objectives of the EMP**

The EMP is intended to provide an easily interpreted reference document that ensures that the project environmental commitments, safeguards and mitigation measures from the environmental planning documents, project approvals, and Scope of Works are implemented. It aims to minimise impacts associated with the development during the construction phase of the project and make sure the impacts on the environment are kept to a minimum. This includes ensuring that the mitigation measures described in the scoping report are implemented.

The objectives for the EMP are:

- To develop, implement and maintain effective management systems for the environmental aspects of the construction, rehabilitation, operation and general maintenance works;
- To document details of environmental protection to infrastructure and controls so that they are able to provide long term protection for the natural environment;
- To ensure compliance with relevant legislation, regulatory requirements and environmental documents;
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects;
- To ensure that all Environmental Management considerations are implemented during the operational and maintenance phases of the upgraded road.

The EMP has been developed based on the findings of the onsite assessment undertaken by Ekwao Consulting.

## **2 PROJECT PHASES**

The EMP takes a pro-active route by striving to address potential problems before they actual occur. This should limit corrective measures required during the construction and operational phases of the project. In particular, the EMP deals with the following phases as briefly described below:

### **2.1 The Pre-Construction Phase**

The EMP offers an ideal opportunity to incorporate pro-active environmental management measures with the goal of attaining long term sustainable development. Pro-active environmental measures minimize the chance of impacts taking place during the construction, operational & maintenance phases.

There is still the chance of accidental impacts taking place; however, through the incorporation of contingency plans (e.g. this EMP) during the planning phase, the necessary corrective action can be taken to further limit potential impacts.

### **2.2 The Construction Phase**

The bulk of the impacts during this phase will have immediate effect (e.g. noise-, dust- and water pollution). If the site is monitored on a continual basis during the construction phase, it is possible to identify these impacts as they occur. These impacts will then be mitigated through the contingency plans identified in the planning phase, together with a commitment to sound environmental management from the main contractor.

### **2.3 The Rehabilitation Phase**

This phase will involve restoring the land impacted during the construction phase as close as possible back to its original state. This process will mainly aim on rectifying the negative impacts that have been caused during construction by replanting vegetation, removing pollution or contaminants and other dangerous substances from groundwater, sediment, or surface water and improvement of the soil.

Some mitigation measures listed in the construction and operational phase include immediate rehabilitation measures on disturbed areas, therefore this phase is interlinked with the construction and operational phase.

### **2.4 The Operational Phase**

By taking pro-active measures during the planning and construction phases, potential environmental impacts emanating during the operational phase will be minimised. This, in turn, will minimise the risk and reduce the monitoring effort, but it does not make monitoring obsolete

### **2.5 The Decommissioning**

The decommissioning phase would entail the dismantling of the upgraded road infrastructure which is expected to have a lifespan of between 20 to 30 years. Since the ECC has a validity period of three years, it is not possible at the present moment to provide environmental impact mitigation measures for the activities likely to take place twenty years from now, since current applicable legislations and regulation might have changed by that time.

### 3 ROLES AND RESPONSIBILITIES

The implementation of this EMP requires the involvement of several stakeholders, each fulfilling a different but vital role to ensure sound environmental management during the construction phase. The roles of such stakeholders are presented in Table 2, below:

**Table 2:** Roles and Responsibility

| Responsible Party/Stakeholder       | Roles /Responsible  |
|-------------------------------------|---|
| <p><b>The Applicant (DPTS)</b></p>  | <ul style="list-style-type: none"> <li>• The Applicant (MEFT) has the ultimately responsible for ensuring that the road upgrading is implemented according to the requirements of the EMP. Although the Applicant appoints specific role players to perform functions on its behalf, this responsibility is delegated.</li> <li>• The Applicant is ultimately responsible for ensuring that sufficient resources (time, financial, human, equipment, etc.) are made available to the other role players to efficiently perform their tasks in terms of the EMP. The Applicant is liable for restoring the environment in the event of negligence leading to damage to the environment.</li> <li>• The Applicant must ensure that the EMP is included in the tender documentation so that the contractor who is appointed is bound to the conditions of the EMP.</li> <li>• The Applicant must appoint an independent Environmental Control Officer (ECO) during the construction phase to oversee all the environmental aspects relating to the development.</li> </ul> |
| <p><b>Project Engineer (PE)</b></p> | <p>Tulipamwe are the Project Engineer (PE) or Project Manager and have been appointed by the 'Applicant' with these roles:</p> <ul style="list-style-type: none"> <li>• To oversee the construction activities related to road upgrading.</li> <li>• To appoint the main contractor, subcontractors and other service providers such as EIA consultants, etc.</li> <li>• To liaise with the Main Contractor and Environmental Control Officer (ECO) on environmental matters as well as any pertinent engineering matters where these may have environmental consequences.</li> <li>• To oversee the general compliance of the Main Contractor with the EMP and other pertinent site specifications. The PE will also be required to be familiar with the EMP specifications and further monitor the Main Contractor's compliance with the environmental specifications on a daily basis, through the site diary, and enforce compliance.</li> </ul>  |
| <p><b>Main Contractor (MC)</b></p>  | <p>Amongst the roles of the Main Contractor (MC) are:</p> <ul style="list-style-type: none"> <li>• To ensure adherence to, and compliance with the EMP in a legal and timely manner.</li> <li>• To ensure that all staff members, sub-contractors and suppliers have a comprehensive understanding of the EMP and adhere to the provisions for the duration of the construction phase.</li> <li>• To appoint someone with a designation of an Environmental Liaison Officer (ELO) to monitor environmental compliance on a day-to-day basis on the construction site.</li> </ul>  |

|   |   |
|---|---|
|   | <ul style="list-style-type: none"> <li>• To ensure that all staff members, sub-contractors and suppliers are aware of the environmental issues relating to the construction activities that they are undertaking on site and of all mitigating and precautionary measures that must be implemented.</li> <li>• To ensure that training is undertaken for construction supervisors and crews to recognise environmental 'red flags' and ensure that these will not be disturbed, damaged or removed and to be brought to the immediate attention of the PE or ELO or ECO to determine an action plan and way forward.</li> <li>• To develop a layout of the operations of the construction site indicating the position of all construction activities, including but not limited to: <ul style="list-style-type: none"> <li>○ offices,</li> <li>○ ablution facilities,</li> <li>○ storage areas,</li> <li>○ workshops,</li> <li>○ batching plant,</li> <li>○ stockpile areas,</li> <li>○ waste disposal facilities,</li> <li>○ hazardous substance storage area,</li> <li>○ access routes, etc.</li> </ul> </li> <li>• To be submit the layout plan to the PE and ECO for acceptance prior to site establishment.</li> <li>• To ensure that all recommendations made in monitoring and audit reports are implemented throughout the construction phase.</li> <li>• To accept liability for any and all work required in terms of the environmental specifications, resulting from environmental negligence, mismanagement and or non-compliance.</li> </ul>   |
| <p><b>Environmental Control Officer (ECO)</b></p> | <p>The Environmental Control Officer (ECO) is appointed by the PE in consultation Applicant with these roles:</p> <ul style="list-style-type: none"> <li>• Should form part of the project team and be involved in all aspects of the project planning that can influence environmental conditions on the site.</li> <li>• Should attend relevant project meetings, conduct monthly inspections to assess compliance with the EMP and be responsible for providing feedback on potential environmental problems associated with the road upgrading.</li> <li>• Assist in ensuring that the necessary environmental authorizations and permits have been obtained prior to construction commencing.</li> <li>• Site inspections of all construction areas with regard to compliance with the EMP, monitoring and verifying adherence to the EMP.</li> <li>• Monitoring and verifying that environmental impacts are kept to a minimum.</li> <li>• To take appropriate action if the specifications are not followed.</li> <li>• Monitoring the undertaking by the MC of environmental awareness training for all new personnel coming onto site.</li> <li>• Advising on the removal of person(s) and/or equipment not complying with the specifications.</li> <li>• Auditing the implementation of the EMP and compliance with the EA on a quarterly basis.</li> <li>• Has the right to enter the site and do monitoring and auditing at any time, subject to compliance with health and safety requirements applicable to the site (e.g. wearing of safety boots and protective head gear. )</li> </ul> |
| <p><b>Environmental Liaison Officer (ELO)</b></p> | <p>The MC has to appoint an Environmental Liaison Officer (ELO), ideally a senior and respected member of the construction crew to fulfil amongst others the following functions:</p>   |

|  |   |
|--|---|
|  | <ul style="list-style-type: none"> <li>• To assist with day-to-day monitoring of the construction activities.</li> <li>• To oversee the MC's internal compliance with the EMP requirements and ensuring that the environmental specifications are adhered to.</li> <li>• To keep detailed records of all site activities pertaining to the environmental aspects including keeping an environmental registry in which environmental related complainants from stakeholders and IAPs are recorded.</li> <li>• To keep a record of all on-site environmentally related incidents/ accidents and how these incidents were dealt with. Experience has revealed that, ELO's that can relate to the work force are the most effective for information transfer and ensuring compliance with the EMP.</li> </ul> |
|--|---|

## 4 ENVIRONMENTAL AWARENESS PLAN

The objective of the Environmental Awareness Plan (EAP) is to ensure that all construction and operation personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm.

To achieve effective environmental management, it is important that contractors and site employees are aware of their responsibilities in terms of the relevant environmental legislation and the contents of this EMP. The MC is responsible for informing its employees and subcontractors (transportation contractor) of their environmental obligations in terms of the environmental specifications, and for ensuring that employees are adequately experienced and properly trained in order to execute the works in a manner that will minimise environmental impacts.

The MC's obligations of the EAP are to ensure that :

- employees have a basic understanding of the key environmental features of the site and its surrounding environment.
- a copy of the EMP is readily available on-site, and that all site staff are made aware of the location and have access to the document.
- employees are made familiar and acquainted with the requirements of the EMP and the environmental specs as they apply to the upgrading activities.
- prior to commencing any new site works, all employees have attended an environmental induction training session.
- appropriate communication tools are used to outline the environment's "do's" and "don'ts" to employees.

It is important for records to be kept of those that have completed the relevant training. Also, refresher sessions must be held from time to time to ensure the employees are aware of their environmental obligations.

### 4.1 Environmental Awareness Training

An Environmental Awareness Training must be undertaken by the main contractor and must take the form of an on-site talk and demonstration before the commencement of construction activities on site. This Environmental Awareness Training should include the ENP code of conduct. A record of attendance of this training must be maintained by the contractor on site and included in its environmental compliance report. The awareness training must be presented to all persons who are to work on the site – be it for short or long durations.

## **4.2 Induction Training**

This induction training should be undertaken by the MC and should include discussions of the environmental policy of ENP as well as its values and functions of the EMP as well as the reasons for compliance to provisions of the EMP. these.

In addition, the induction training must highlight the overall do's and do'ts on site and clarify the repercussions of not complying with these. The reporting procedure must be explained during the induction as well. Opportunity for questions and clarifications must form part of the induction training. To ensure that comprehension is achieved, the induction can be made in the language most understood by employees (Afrikaans, Damara>Nama, Oshiwambo, Lozi, etc). A record of attendance of this training must be maintained by the contractor on site and reported in the compliance report.

## **4.3 Toolbox Talks**

Toolbox talks should be held on a scheduled and regular basis (initially once a week, fortnightly, monthly and then quarterly) where the MC and all employees (including those in the employment of subcontractors or third parties) on site hold talks relating to environmental practices and safety awareness on site. These talks should also include discussions on possible common incidents occurring on site and the prevention of reoccurrence thereof. Records of attendance and the awareness talk subject must be kept on file.

## **4.4 Housekeeping Rules**

To ensure a harmonious working relationship and good conduct at the contractor's campsite a general regard for the social and ecological well-being of the site and adjacent areas is expected of the site staff. The following general rules are recommended:

- No alcohol and drugs are allowed on the campsite;
- No firearms are allowed on the campsite;
- No dangerous tools, i.e. traditional spears, knives, pangas, etc on the campsite;
- No music amplifiers are allowed on the campsite
- Excessive noise is not allowed;
- Dogs and cats are not allowed on the campsite;
- Open fires must be made at designated sites
- Harvesting of firewood is not allowed;
- No stealing of company assets/properties is allowed or from each is allowed;
- Consumables (water, electricity, toilet papers, etc.) must be used sparingly;
- No poaching of wildlife in the park is allowed;
- Trespassing on adjacent private properties is forbidden;
- Driving under the influence of alcohol is prohibited, and
- Accommodating friends and or relatives on the campsite is forbidden.



## 5 ENVIRONMENTAL MANAGEMENT MEASURES

Environmental management measures have been presented in the following tables covering construction, operational/maintenance, rehabilitation and/or decommissioning, where applicable:

### 5.1 EMP for the Pre-Construction Phase

**Table 3:** Management Measures for the Pre-Construction Phase

| Activity/Aspect              | Management Measures   | Mitigation Timing                              | Party Responsible  |
|------------------------------|---|--|--|
| <b>Communications</b>        | <ul style="list-style-type: none"> <li>• Devise and implement a stakeholder communication and engagement strategy where information sharing sessions are held with stakeholders and Interested and Affected Parties (IAPs) from time to time.</li> <li>• Keep all stakeholders informed about the progress being made with the road upgrade in an open and transparent manner.</li> <li>• Ensure that opportunity is provided to stakeholders to continue raising any concerns (complainants) about any aspects of the project that they are not happy with.</li> <li>• Comply with the labour reporting requirements of the Ministry of Labour.</li> <li>• Obtain all mandatory permits (water abstraction permits, consumer installation certificates, etc) and licenses (ECC, etc) required for the implementation of the project.</li> <li>• Record complaints received from IAPs, investigate such complainants and take corrective actions. Provide feedback where warranted.</li> <li>• Develop and maintain a registry of both statutory stakeholders and IAPs including the names of key people and contact numbers:. Amongst the key stakeholders and IAPs are:               <ul style="list-style-type: none"> <li>○ ENP Management;</li> <li>○ MEFT (ECC, etc);</li> <li>○ MME (CIP; etc)</li> <li>○ MAWLR (WAP, Borrow Pit permits, etc)</li> <li>○ RFA (fuel rebates, etc)</li> <li>○ Neighbouring famers (in the event of fire outbreak,);</li> <li>○ Neighbouring lodges, (in the event of a fire outbreak), etc.</li> <li>○ Service providers to the park,</li> <li>○ Nearest Health Centre, clinic or hospital,</li> <li>○ Nearest police</li> <li>○ Emergency Service (Ambulance Services; Fire Brigade, etc.)</li> </ul> </li> </ul> | Prior to starting with the road upgrade        | MC<br><br>PE   |
| <b>Contractor's Campsite</b> | <ul style="list-style-type: none"> <li>• The contractor's campsite should be located inside the park and on the land reserved for the park rest camps, initially at Okaukuejo rest camp where the construction is scheduled to start.</li> <li>• The land allocated for the campsite must be big enough to meet the current and future accommodation requirements of the appointed contractor, such as:               <ul style="list-style-type: none"> <li>○ an administrative office,</li> <li>○ parking area for construction vehicles,</li> <li>○ machine repair workshop,</li> <li>○ accommodation facilities for employees</li> <li>○ adequate ablution facilities, etc.</li> </ul> </li> <li>• Site the campsite on land that has been already disturbed, taking the prevailing wind direction into account, away from sensitive areas and preferably out of sight of park guests/tourists.</li> </ul>  | Prior to starting with construction activities | PE<br><br>ENP Management<br><br>MC<br><br>ELO<br><br>ECO |

|                              |   |  |                  |
|------------------------------|---|--|------------------|
|                              | <ul style="list-style-type: none"> <li>The site allocated should be clearly demarcated and the contractor's is expected to provide temporarily fencing to ensure security and safety of its assets.</li> </ul>  |  |                  |
| <b>Climatic changes</b>      | <ul style="list-style-type: none"> <li>Use green technology in developing construction campsite by installing solar panels, wind generators and water recycling facilities</li> <li>Provide adequate day natural lighting and use energy saving bulbs.</li> <li>Provide adequate potable chemical toilets with running water at the campsite and at road construction sites.</li> <li>Avoid open air burning of wastes.</li> <li>Prevent and control bush fires.</li> <li>Ensure machines and equipment planned for the project use are installed with EMS to abate accentuating contributors of climate change.</li> </ul> | During campsite establishment and throughout the construction period | MC<br>ELO<br>ECO |
| <b>Health and Sanitation</b> | <ul style="list-style-type: none"> <li>Develop a sanitation management plan for the road upgrading activities which includes setting up adequate sanitation facilities at the campsite and providing mobile toilets facilities along the road being upgraded and at all the construction sites.</li> <li>Develop eco-friendly sanitation facilities with capability to recycle water and reuse of the sludge.</li> <li>Under no circumstances should employees resort to the use of 'natural bush toilet'.</li> </ul>   | During campsite establishment and throughout construction period     | MC<br>ELO<br>ECO |

## 5.2 EMP for the Construction Phase

**Table 4:** Management Measures for the Construction Phase

| Activity/Aspect                 | Management Measures   | Mitigation Timing             | Party Responsible                             |
|---------------------------------|---|-------------------------------|---|
| <b>Soil and Water Pollution</b> | <ul style="list-style-type: none"> <li>Minimise risks of accidental spillage and clear area immediately once a spill occurs.</li> <li>Practice good housekeeping practices.</li> <li>Use silt curtains to minimise sediment suspension and transport while working near water crossings.</li> <li>Discharged waste water into the natural environment should meet recommended standards applied by the MWALR.</li> <li>Avoid the use of heavy machines and equipment at river streams riparian.</li> <li>Where feasible schedule construction activities around river streams during the winter months.</li> <li>Provide solid waste/garbage collection containers and sanitation facilities.</li> <li>Garbage should be segregated, biodegradable composted or sold to locals and others collected in containers and disposed of periodically.</li> <li>Under no circumstances should non-biodegradable waste be buried at the construction sites or campsite.</li> <li>Avoid construction of workers campsite facilities close to surface water sources.</li> </ul> | During the construction phase | MC<br><br>ECO<br><br>PE<br><br>ENP Management |

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|  | <ul style="list-style-type: none"> <li>• Temporary work places must be provided with sanitary (mobile toilets) and must be located far away from water courses.</li> <li>• Content of mobile toilets should not be discharged in water courses or on land.</li> <li>• All sanitary facilities must be properly maintained and satisfactorily decommissioned after the project.</li> <li>• Avoid burning of waste and melting bitumen on arable land.</li> <li>• Perform servicing and maintenance of construction machinery, equipment and vehicles at the workshop which should have impervious floor, bunded and fitted with oil separators. Only breakdown maybe attended to at the construction site.</li> </ul>  |  |                  |
| <b>Protection of Vegetation</b>        | <ul style="list-style-type: none"> <li>• Limit disturbance of natural vegetation to a minimum by confining road upgrading activities to the existing road.</li> <li>• Removal of large trees must be avoided. No protected tree species or plants may be uprooted or removed without the relevant permits having been obtained from ENP Management and the Department of Forestry/Park Management</li> <li>• Remove and control all alien woody plant species that may appear during construction activities.</li> <li>• The clearing of vegetation must be kept to a minimum and remain within the footprint of the particular activity undertaken.</li> <li>• Disturbed areas must be rehabilitated immediately after construction has been completed in that particular areas.</li> <li>• Disturbed areas on road shoulder must be rehabilitated immediately after construction has been completed in that area (e.g. by sowing appropriate indigenous grass species).</li> <li>• Workers must be confined to areas under the construction and are not allowed to walk around the park.</li> <li>• Areas that have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species.</li> <li>• Monitor all sites disturbed by construction activities for potential colonisation by exotics or invasive plants and control these as they emerge.</li> <li>• Implement fines for the damage or destruction of marked and protected specimens.</li> <li>• Employees may not tamper or remove flora and neither may anyone collect seed from the plants without permission from ENP Management.</li> </ul> | Ongoing throughout the construction phase    | MC               |
| <b>Protection of Fauna and Habitat</b> | <ul style="list-style-type: none"> <li>• The standard speed restrictions of 60km/hr within the park must be complied with at all times.</li> <li>• Any temporary roads made to accommodate traffic during the upgrading should be planned in such a way that sensitive areas are avoided and by following the 'light footprint' /rustic principle.</li> <li>• Normal precautionary measures as detailed in the Park's Regulations should be strictly complied with, i.e. no poaching, no trapping devices, no guns allowed on the park, no picking or collection of bones/ivory of otherwise dead wildlife etc.</li> <li>• All staff and employees of the contractor including those of third parties must undergo an environmental induction workshop on the protection of fauna and habitat.</li> </ul>   | Ongoing throughout the duration of upgrading | MC<br>ELO<br>ECO |

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|  | <ul style="list-style-type: none"> <li>• Runoff rain water from the sealed road will accelerate grass and seedling germination on the periphery of the road which, in turn, will attract grass eating fauna on the road edges. Careful driving along the new road is therefore critical</li> <li>• Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff and contractors.</li> <li>• The spatial extent of construction activities must be minimized, and as far as possible must be restricted to the footprint of the exiting road.</li> <li>• No poaching or snaring of any game is a criminal act and therefore not permitted. Offenders can be arrested, prosecuted and jailed if found guilty.</li> <li>• The project should maintain connectivity between ecologically important habitats by retaining natural corridors for the movement of fauna.</li> <li>• Pets and livestock are not allowed on site.</li> <li>• Any bird nests that are found during the construction period must be reported to the Environmental Control Officer (ECO).</li> <li>• Movement of construction vehicles and workers beyond the boundary of the site must be minimized. In addition, workers must be instructed to minimize disturbance of birds at all times, and steps must be taken to ensure that no illegal hunting occurs.</li> <li>• Driving at night or after sunset is not allowed.</li> </ul>   |                                    |                          |
| <b>Wetlands or watercourses and erosion.</b> | <ul style="list-style-type: none"> <li>• Where feasible, construction over wetland sections of the road should be rescheduled and performed only during the dryer winter months of the year.</li> <li>• During the contractor's planning phase for construction work – all possible wetlands including river streams crossed by the road being upgraded should be identified and clearly demarcated as 'No-Go Areas' during the rainy season.</li> <li>• During the construction phase measures must be put in place to control the flow of excess water so that it does not impact on the surface vegetation.</li> <li>• Where construction occurs in the demarcated watercourse and buffer, extra precautions should be implemented so as to minimise watercourse loss.</li> <li>• Implement an appropriate storm water management around the excavation including the borrow pits, to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse.</li> <li>• Maintenance of construction vehicles / equipment should not take place within the watercourse or watercourse buffer.</li> <li>• The wetland rehabilitation- and monitoring plan must be used in conjunction with this EMP to mitigate construction related impacts. Surface water as well as water flowing within the soil profile should be taken into account.</li> <li>• Consider the various methods and equipment available and select whichever method(s) that will have the least impact on watercourses.</li> <li>• Water may seep into trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water thus reducing the risk of erosion. Effective sediment traps should be installed.</li> </ul> | Throughout the construction period | MC<br><br>ELO<br><br>ECO |

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| <b>Erosion and Sedimentation</b>  | <ul style="list-style-type: none"> <li>• Do not allow erosion to develop on a large scale before taking action.</li> <li>• Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction campsite and work areas.</li> <li>• Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced; hence minimizing chances of soil erosion and accumulation of sediments,</li> <li>• Make use of existing roads and tracks where feasible, rather than creating new routes through vegetated areas.</li> <li>• Leave as much natural vegetation as possible intact during construction.</li> <li>• Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area.</li> <li>• Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed and re-established after construction is completed.</li> <li>• Colonisation of the disturbed areas by plants species from the surrounding natural vegetation must be monitored to ensure that vegetation cover is sufficient within one growing season. If not, then the areas need to be rehabilitated with a grass seed mix containing species that naturally occur within the study area.</li> <li>• Once construction is complete, obsolete roads should be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion, while the natural species composition should be re-established.</li> </ul> | Ongoing throughout the construction period | Contractor<br><br>ECO    |
| <b>Storage and handling of hazardous materials and protection of soil and groundwater</b> | <ul style="list-style-type: none"> <li>• Materials storage areas should not be allowed in close proximity to ecologically sensitive areas.</li> <li>• Provide the ECO with a list of all petroleum, chemical, harmful and hazardous substances and materials on site, together with storage, handling and disposal procedures for these materials.</li> <li>• Ensure that all hazardous substances (chemicals, oils, etc.) are stored in appropriate, tamper proof containers in locked stores.</li> <li>• Petroleum, chemical, harmful and hazardous materials must be stored in enclosed, bunded areas. The bunded areas shall be clearly marked.</li> <li>• The bund must have a volume of 10% of the volume of the largest tank in the storage area plus 10% of the volume of all other tanks.</li> <li>• The slab must be sloped towards a sump to enable any spilled fuel and water to be removed.</li> <li>• Any wastewater collected at the sump shall be disposed of as hazardous waste.</li> <li>• Ensure that all hazardous substances are used and handled by qualified personnel on bunded surfaces.</li> <li>• Ensure that no oil, petrol, diesel etc. is discharged into the natural environment.</li> <li>• All hazardous products to be dispensed from 200 liter drums shall be transferred by pump, and not dispensed by tipping of the drum.</li> <li>• Tanks containing fuel must have lids, which are to remain firmly shut.</li> </ul>  | Ongoing throughout the construction period | MC<br><br>ELO<br><br>ECO |

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|  | <ul style="list-style-type: none"> <li>Gas and liquid fuel may not be stored in the same storage area.</li> <li>No smoking is allowed inside the stores or within 3 m of a bund</li> <li>The Contractor must ensure that there is adequate fire-fighting equipment at the fuel stores.</li> <li>Fuels and chemicals may not be stored under trees.</li> <li>Exercise extreme care with the handling of diesel and other toxic solvents so that spillage is minimised.</li> <li>Vehicles and machinery may not veer from the dedicated roads and tracks.</li> </ul>   |  |                                    |
| <b>Concrete and cement mixing</b>                  | <ul style="list-style-type: none"> <li>Ensure that concrete and cement works are undertaken in specified areas only.</li> <li>Ensure that all operations that involve the use of cement and concrete are carefully controlled. Water and slurry from concrete mixing operations must be contained to prevent pollution of the ground surrounding the mixing points.</li> <li>Use plastic trays or liners when mixing cement and concrete. Do not mix cement and concrete directly on the ground.</li> <li>Excess concrete from mixing must be deposited in a designated area awaiting removal to an approved landfill site.</li> <li>All visible remains of excess concrete shall be physically removed immediately and disposed of as waste. Washing the visible signs into the ground is not acceptable. All excess aggregate shall also be removed.</li> </ul>  | During the construction period           | MC<br>ELO<br>ECO                   |
| <b>Handling and Disposal of Contaminated water</b> | <ul style="list-style-type: none"> <li>No discharge of pollutants such as cement, concrete, lime, chemicals, fuels or oils will be allowed into any water resource.</li> <li>Only above ground temporary storage tanks will be allowed on site</li> <li>Contaminated or potentially contaminated water will be kept separated from unpolluted storm water and no unpolluted storm water will be allowed into any conservancy tanks.</li> </ul>   | Ongoing                                  | MC<br>ELO<br>ECO                   |
| <b>Visual Impacts</b>                              | <ul style="list-style-type: none"> <li>Locate construction camps inside the borders of ENP on the land designated for the three main resorts (Okaukuejo, Halali, Namutoni, etc.) in areas that are already disturbed to avoid additional disturbance.</li> <li>Choose a site which ensures that the campsite is located out of sight of park guests/tourists.</li> <li>Keep the construction camp and construction areas neat and tidy at all times. All waste products must be removed from the site.</li> <li>Dust suppression measures must be implemented during earthworks so as to minimise the impact of dust clouds.</li> <li>No structure may exceed the height of the surrounding vegetation.</li> <li>Additional trees and shrubs can be planted around the structures as an offset measure to the loss in vegetation in the footprint of the infrastructure.</li> <li>All signage should be non-intrusive but clear. No sign boards will be placed on separate framework higher than 2 m above the ground level to avoid it exceeding the height of vegetation.</li> <li>Working hours shall generally be restricted to daylight hours.</li> </ul> | Ongoing throughout the operational phase | MC<br>ELO<br>ECO<br>ENP Management |

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|  | <ul style="list-style-type: none"> <li>Security lights shall be directed from the perimeter wall towards the center of the camp with a down angle. Up-lighting of structures should be avoided. Light should be directed downwards and focused on the object requiring illumination.</li> <li>Avoid directing the light towards the areas from where it would become offensive to external receptors.</li> <li>Light spill must be minimised. All security lighting should have 'blinkers' or be specifically designed to ensure light is directed downwards while preventing side spill.</li> <li>Lighting for security and safety purposes must be directed downwards and towards building structures and plant, to reduce light spill beyond the property boundary.</li> <li>Structures must be well maintained to avoid any visual decay. Consideration should be given to making use of structures that blend in well with the natural surroundings.</li> <li>Ensure that dust does not escape from the any stored materials into the atmosphere becoming a visual annoyance.</li> <li>Waste around the facility such as windblown papers and plastics should be regularly picked up to avoid visual annoyance.</li> </ul>   |  |  |
| <b>Solid Waste Handling &amp; Disposal</b> | <ul style="list-style-type: none"> <li>Litter generated by the construction crew must be collected in rubbish bins and disposed of weekly at registered waste disposal sites.</li> <li>Where feasible, collect waste paper, glass and metal waste separately and arrange for collection by recycling contractors.</li> <li>Litter bins must be equipped with a closing mechanism to prevent their contents from blowing out or being scavenged on by the surrounding animals.</li> <li>Ensure that personnel make use of the litter bins provided. Keep all work sites at the contractor's campsite tidy and litter free at all times.</li> <li>All building rubble, solid and liquid waste etc. must be disposed of as necessary at an appropriately licensed refuse facility.</li> <li>Ensure that no refuse waste are burnt on the premises or on surrounding premises.</li> <li>The construction site must be kept in a clean and orderly state at all times.</li> <li>Ensure that no litter, refuse, waste, rubbish, rubble, debris and builders waste generated on the site be placed, dumped or deposited on adjacent/surrounding veld during or after the construction period of the project and that they are disposed of an approved at an approved registered waste facility.</li> </ul> | Throughout the construction period   | MC<br><br>ELO<br><br>ECO<br><br>ENP Management |
| <b>Storm water Management</b>              | <ul style="list-style-type: none"> <li>No stockpiles or construction materials may be stored or placed within any drainage lines.</li> <li>Should a freak storm displace the temporary earth embankments or other erosion control structures, a visual inspection of the site must be made and any damage be recorded.</li> <li>Any damage and loss of soil resulting from a storm is to be remedied immediately. Should the temporary walls collapse due to construction error, the contractor is to fund the remediation process.</li> <li>Storm water at the construction crew camp must be managed so as to reduce the silt loads into the ecological environment. Measures must be implemented to distribute</li> </ul>  | Before the onset of the wet season, throughout the wet season and immediately after the wet season | MC<br><br>ELO<br><br>ECO<br><br>ENP Management |

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|                                | <p>storm water as evenly as possible to avoid point sources of erosion.</p> <ul style="list-style-type: none"> <li>• The site must be managed in a manner that prevents pollution of drains, downstream watercourses or groundwater, due to suspended solids, silt or chemicals.</li> <li>• Make use of erosion control measures to minimise erosion at excavation / clearing sites or aggregate storage sites. Earth moving construction activities to take place in dry season as far as possible.</li> <li>• The protective buffer around the watercourses must be respected as it acts as a trap for sediment and contaminants. Measures must be put in place around sensitive areas to protect these from sediment and contaminants.</li> <li>• Remove only vegetation essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.</li> <li>• Ensure that measures are in put place to control the flow of excess water so that it does not impact on the surface vegetation.</li> <li>• The accumulation of water on the surface should be prevented. The drainage of the surface should be done in such a way that storm water will be led away quickly and efficiently without any erosion taking place.</li> <li>• Do not allow surface water or storm water to canalize or be concentrated.</li> <li>• Runoff from roads must be managed to avoid erosion and pollution problems.</li> <li>• Place and maintain erosion control barriers as appropriate to prevent sedimentation.</li> <li>• Prevent storm water or contaminated water directly entering any watercourse.</li> <li>• Repair all erosion damage as soon as possible. Do not allow erosion to develop on a large scale before effecting repairs.</li> <li>• The stabilisation of disturbed areas, access roads and / or steep cuttings is very site specific and could include reno mattresses, mitre drains, drainage pipes, benches, gabions; scarifying (ripping) areas along the natural contours or packing branches and rocks.</li> <li>• Monitor all rehabilitated areas for at least a year following the completion of rehabilitation works for failure of vegetation to establish and / or erosion. Immediately implement remedial measures as required</li> </ul> |  |                           |
| <p><b>Noise Management</b></p> | <ul style="list-style-type: none"> <li>• Construction activities must be limited to normal ENP hours and according to ENP Management policies and guidelines.</li> <li>• The contractor must ensure that noise levels remain within acceptable limits.</li> <li>• Complaints register will be maintained, in which any complaints from the community will be logged. Complaints will be investigated and, if appropriate, acted upon.</li> <li>• The operational layout shall be designed so as to control noise at source by the selection and positioning of temporary and permanent plant. Appropriate directional and intensity settings should be maintained on hooters and sirens.</li> <li>• Silencer units on plant and vehicles shall be maintained in good working order where feasible for use.</li> </ul>   | <p>Ongoing throughout the rainy season</p> | <p>MC<br/>ELO<br/>ECO</p> |



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|                                   | <ul style="list-style-type: none"> <li>Where required, the Contractor shall provide noise attenuation measures in the form of cladding and earth beams between sources of on-site noise and surrounding fauna and avifauna.</li> <li>Ensure that employees and staff conduct themselves in an acceptable manner while on site, both during work hours and after hours. No loud music is permitted on site or in the Camp.</li> </ul>   |                                    |                          |
| <b>Dust Control Management</b>    | <ul style="list-style-type: none"> <li>Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.</li> <li>Ensure proper rehabilitation of disturbed areas in order to minimise bare patches.</li> <li>Prevailing wind directions should be taken into account when selecting sites where to store construction materials that are prone to wind erosion such as gravel and sand.</li> <li>Avoid hauling dusty materials (such as sand &amp; gravel) from borrow pits to the construction sites during heavy wind conditions.</li> <li>Provide suitable PPEs to employees working in areas where dust levels are higher.</li> <li>Any complainant received from any stakeholder with respect to</li> </ul>   | Throughout the construction period | MC                       |
| <b>Crime, Safety and Security</b> | <ul style="list-style-type: none"> <li>Ensure that the construction vehicles are under the control of competent personnel and are in proper working order.</li> <li>Ensure that only suitably qualified personnel use construction vehicles</li> <li>Ensure that the contact details of the police or security company and ambulance services are available on site.</li> <li>Limit access to the construction crew camp to construction workers through access control.</li> <li>Ensure that the requirements of the Occupational Health and Safety protocols are adhered to at all times during the construction period.</li> <li>Ensure that the handling of equipment and materials is supervised and that vehicular traffic during construction activities is limited a a speed limit of 30 km/hr.</li> <li>Site notices informing the tourists of the planned activities must be placed at visible locations a few days prior to new sections being started.</li> <li>The safety and security fence around the development site must be completed before construction commences internally.</li> <li>Security fence is to be inspected daily to ensure no illegal entry points are created.</li> <li>The contractor must supply his own security arrangements in consultation with ENP Management for the construction campsite within the framework of the EMP.</li> <li>. Equipment and materials must be handled by staff that have been supervised and adequately trained.</li> <li>Staff must be regularly updated about the safety procedures.</li> <li>Emergency facilities must be available and adequately supplied for use by staff and guests.</li> <li>Limit access to the construction crew camp only to the workforce. Do not allow the movement of public within the</li> </ul> | Throughout the construction phase  | MC<br><br>ENP Management |

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|                           | <p>development site by posting notices at the entrance gates, and where necessary on the boundary fence.</p> <ul style="list-style-type: none"> <li>• Appropriate notification signs must be erected, warning the residents and visitors about the hazards around the construction site and presence of heavy vehicles.</li> </ul>   |   |                      |
| <b>Fire Prevention</b>    | <ul style="list-style-type: none"> <li>• The Contractor must take all the necessary precautions to ensure that fires are not started as a result of its activities on site.</li> <li>• No open fires will be permitted outside the contractor's campsite.</li> <li>• No incineration or burning of waste will be permitted anywhere on site.</li> <li>• Provide personnel and staff with gas for cooking purposes in demarcated, safe areas within the construction camp.</li> <li>• Establish and maintain a fire break around the perimeter of the construction site prior to the commencement of construction activities. The input of ENP Management must be sought in terms of its width and timing. The actual execution of the firebreak must be coordinated with ENP Management. The contractor may not act independently in this connection.</li> <li>• The Contractor should contact all of the adjacent farm owners prior to the commencement of the construction phase and ensure that he/she has the contact numbers so that they can be contacted in the event of a fire.</li> <li>• Contractor to ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced.</li> <li>• Measures to reduce the risk of fires include clearing working areas and avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high risk dry, winter months.</li> <li>• The Contractor shall supply all site offices, kitchen areas, workshop areas, material stores and any other areas identified with suitable, tested and approved fire-fighting equipment.</li> <li>• All equipment shall be maintained in good operating order.</li> <li>• Contractor to provide fire-fighting training to selected construction staff.</li> <li>• In the event of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate ENP for any damage caused by the fire. The contractor should bear the costs associated with fighting the fire.</li> <li>• The control of fires within ENP is the responsibility of ENP Management. The contractor should not attempt to control natural fires without the consent and direction of ENP.</li> </ul> | Throughout the duration of construction | MC                   |
| <b>Heritage Resources</b> | <ul style="list-style-type: none"> <li>• Should archaeological sites or graves be exposed during construction work, it must immediately be reported to ENP Management and the office of NHC in Windhoek so that an investigation and evaluation of the finds can be made.</li> <li>• Upon receipt of such notification, the NHC will arrange for the excavation to be examined by an Archaeologist as soon as possible.</li> <li>• Under no circumstances shall archaeological artefacts be removed, destroyed or interfered.</li> </ul>   | Throughout the construction duration    | MC<br>ENP Management |

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|---|---|--|------------------------------------|
|   | <ul style="list-style-type: none"> <li>Any archaeological sites exposed during construction activities may not be disturbed prior to authorisation by NHC or Archaeologist.</li> </ul>  |  |                                    |
| <b>Sewerage and Effluent (contractor's construction camp)</b> | <ul style="list-style-type: none"> <li>Ensure that the facility sewage system is maintained in a sanitary and operational state.</li> <li>Ensure that the facility sewage system is not overloaded, and that it functions within its design capacity.</li> <li>Take action to reduce output or increase capacity if necessary.</li> <li>Ensure that measures are put in place to prevent all leaks and spills.</li> <li>Repairs to the sewage system must be done immediately by qualified and experienced personnel.</li> <li>In the event of a failure or overflow situation at the waste water treatment plant, implement a back-up system which will ensure that no sewage is discharged into the environment.</li> <li>Regular removal of sludge from the septic tanks by a licenced contractor (if required).</li> <li>Ensure that all treated effluent meets or exceeds the water quality regulations prior to discharge or reuse.</li> <li>Undertake monthly wastewater monitoring to ensure that the output quality of the water complies with the minimum standards as prescribed by Department of Water Affairs of the MAWLR.</li> <li>Ensure that correct records are kept up to date and are available upon request.</li> </ul>  | Throughout the duration of construction    | MC<br>ELO<br>ECO                   |
| <b>Hazardous Waste</b>  | <ul style="list-style-type: none"> <li>The disposal of hazardous waste must comply with ENP' Regulations and must be complied with.</li> <li>Avoid the generation of hazardous waste wherever possible through procurement processes e.g. purchasing of less toxic / environmentally friendly products.</li> <li>Petroleum, chemicals, harmful and hazardous waste must be stored in enclosed, bunded areas. The bunded areas shall be clearly marked. Such waste shall be disposed of offsite at a licensed hazardous waste disposal site.</li> <li>Hazardous waste may be temporarily stored on site in vessels equipped with secondary containment structure to prevent contamination of soil, groundwater and surface water due to accidental spill or releases.</li> <li>Forecast and prevent potential situations in which accidents and spills can mitigate against unwarranted waste emissions.</li> <li>Hazardous waste must be separated at source from the general waste stream. Common potential hazardous waste include chemicals, used oils, oil contaminated waste, used cooking oils, fats and greases from extraction fans/filters, paint waste, fluorescent bulb waste, battery waste and E-waste.</li> <li>Effective grease traps should be installed at all kitchen or cooking facilities and these should be regularly serviced and checked for functionality.</li> <li>Certain hazardous waste, including used oil, batteries and light bulbs, can be recycled through reputable agents. Where possible, all hazardous waste, including hydrocarbon waste such as oils, should be recycled either by a recognized recycling company or returned to the supplier.</li> </ul> | Ongoing throughout the construction period | MC<br>ELO<br>ECO<br>ENP Management |

|   |  |                                    |    |
|---|--|------------------------------------|----|
|   | <ul style="list-style-type: none"> <li>All hazardous wastes that cannot be reused or recycled should be labelled correctly and stored in the designated waste storage area until collected for correct disposal.</li> <li>Load and unload any solid hazardous materials in a manner that reduces potential spills.</li> </ul>  |                                    |    |
| <b>Spill Prevention and Handling Measures</b> | <ul style="list-style-type: none"> <li>Efforts must be made to stop spill at the source as soon as possible using suitable equipment.</li> <li>Make use of a combination of absorbent materials, earthen bunds or other containment methods to contain the spill materials to the smallest area possible.</li> <li>Recovered spill materials should be temporarily stored in leak-proof containers and disposed of at an approved offsite landfill.</li> <li>It is advisable to neutralise acid spills prior to cleaning it out. Avoid using a strong base when neutralizing a strong acid spill, instead dilute and then neutralise.</li> <li>A detailed written report for any major spill that might occur must be prepared and reported to line ministries (MME &amp; MEFT). A copy of the report should be kept on file.</li> <li>It is advisable to keep a spill kit with the following items at the facility: <ul style="list-style-type: none"> <li>Protective clothing (e.g. overalls, gloves, etc.)</li> <li>Absorbent materials suitable for the chemical being handled</li> <li>Heavy duty plastic bags</li> </ul> </li> <li>When any small repairs or maintenance activities are being undertaken, reasonable precautions must be exercised to avoid spills by making use of spill trays and or making use of impervious sheet.</li> <li>Provision of adequate and frequent training on spill management, spill response and any refueling activities must be provided to all onsite personnel.</li> <li>Machinery, equipment and vehicles must be regularly serviced to minimise oil and fuel leaks.</li> <li>All major petroleum product spills (spill of more than 200 litres per spill) should be reported to MME.</li> </ul> | Throughout the operational phase   | MC |
| <b>Traffic Control</b>                        | <ul style="list-style-type: none"> <li>Appropriate traffic control and warning signage must be implemented during the entire road construction phase.</li> <li>No vehicles will be allowed within the 30m buffer of sensitive environments (wetland, pans, drainage lines)</li> <li>Ensure sufficient maintenance of roads.</li> <li>Establish a speed reduction awareness campaign to the contractor to keep speeds below 40 km/h.</li> <li>Temporary roads (diversions) around active construction sites should clearly and adequately be signposted and made in such a way that sensitive areas are avoided.</li> <li>During tourist peak season, persons should be deployed to warn and to direct tourists to temporary roads around construction sites.</li> </ul>  | Throughout the construction period | MC |
| <b>Attack by wild animals</b>                 | <ul style="list-style-type: none"> <li>During the construction phase, a game ranger should be permanently assigned to the construction crew to protect and guard the crew members against attacks by lions and other wild animals in the park.</li> </ul>  | Throughout the construction phase  | MC |

|                               |  |  |                |
|-------------------------------|--|--|----------------|
|                               | <ul style="list-style-type: none"> <li>Map animal migratory routes and advise works on the existence of dangerous game when working in such areas.</li> <li>Train workers on co-existence behaviour with wildlife.</li> <li>When game such as lions are found sleeping around the construction site, they should not be disturbed.</li> </ul>  |  | ENP Management |
| <b>Socio-economic Impacts</b> | <ul style="list-style-type: none"> <li>Where possible, the PE should make it a requirement for the MC and subcontractors to implement an indigenous 'first policy' for construction, specifically for semi and low-skilled job categories. (For the purpose of this report, the Hai//om people are considered as the indigenous people).</li> <li>Maximise the use of local labour from surrounding communities for low – semi skilled jobs as far as possible.</li> <li>Implement mitigation measures to monitor and control the activities of construction workers and for the control of nuisance impacts.</li> <li>Access to the construction site must be strictly controlled.</li> <li>Where feasible, training and skills development programme for surrounding community locals should be run throughout the construction period.</li> <li>The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local sewer main is possible. The provision o</li> </ul> | When hiring at beginning of the contract and throughout the construction phase | MC<br><br>PE   |

### 5.3 EMP for Rehabilitation Phase

**Table 5:** Management Measures for the Rehabilitation Phase

| Activity/Aspect  | Management Measures   | Mitigation Timing                                       | Party Responsible |
|--|---|---|-------------------|
| <b>Removal of construction phase structures and infrastructure</b> | <ul style="list-style-type: none"> <li>Clear and completely remove from site all construction plant, equipment, storage containers, temporary fencing, temporary services, fixtures and any other temporary works.</li> <li>Materials that will not be used again must be sold if possible or rehabilitated to blend in with the surrounding landscape.</li> <li>Ensure that all access roads utilised during construction (which are not earmarked for closure and rehabilitation) are returned to usable state and/or state no worse than the state prior to construction.</li> </ul> | On completion of construction activities before leaving | MC                |
| <b>Inert water, Rubble and Hazard Waste Removal</b>                | <ul style="list-style-type: none"> <li>Clear the site of all inert waste and rubble, including surplus rock, foundation and batching plant aggregates.</li> <li>Load and haul excess spoil and rubble to fill in borrow pits/dongas or to dump sites indicated/approved by the ECO and ENP Management.</li> <li>Remove from site all domestic waste and dispose of in the approved manner at a registered waste disposal site.</li> <li>Remove from site all temporarily fuel stores and , hazardous substances stores.</li> </ul>  | Before leaving the construction campsite                | MC                |

|  |  |   |                                    |
|--|--|---|------------------------------------|
|  | <ul style="list-style-type: none"> <li>• Hazardous waste stores and pollution control sumps. Dispose of hazardous waste in the approved manner.</li> <li>• Remove from site all pollution contaminated structures. Dispose of materials that will not be used again as hazardous waste.</li> <li>• Remove from site all temporary sanitary infrastructure and waste water disposal system. Take care to avoid leaks, overflow and spills and dispose of any waste in the approved manner.</li> </ul>   |   |                                    |
| <b>Vegetation rehabilitation</b>               | <ul style="list-style-type: none"> <li>• Cordon off areas that are under rehabilitation as no-go areas using danger tape and wooden droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access.</li> <li>• Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.</li> <li>• Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.</li> <li>• Introduce adequate sedimentation control measures at watercourse crossings and when excavation or disturbance within moist grasslands takes place.</li> <li>• Address erosion donga crossings, applying soil erosion control and bank stabilisation procedures as specified by the ECO.</li> <li>• Do not allow erosion to develop on a large scale before effecting repairs. When in doubt, seek advice from the ECO.</li> <li>• Repair all erosion damage as soon as possible and in any case not later than six months before the termination of the maintenance period to allow for sufficient rehabilitation growth</li> </ul> | Throughout the rehabilitation process/phase | MC<br>ELO<br>ECO<br>ENP Management |
| <b>Wetland and Watercourses Rehabilitation</b> | <ul style="list-style-type: none"> <li>• Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction.</li> <li>• Implementation of best rehabilitation/management practices.</li> <li>• Rehabilitate or revegetate disturbed areas.</li> <li>• Monitor the establishment of alien invasive species within the areas affected by the construction and take immediate corrective action where invasive species are observed to establish.</li> </ul>  | Throughout the rehab phase                  | MC                                 |

#### 5.4 EMP for the Operational Phase

Kindly note that the Operational Phase of this document is to be used in conjunction with ENP Management Plan and Maintenance Plan.

**Table 6:** Management Measures for the Operational Phase

| Activity/Aspect                                    | Actions Required During the Operational Phase of the Upgraded Road  | Mitigation Timing                                   | Party Responsible                              |
|--|---|---|--|
| <b>Protection of Vegetation</b>                    | <ul style="list-style-type: none"> <li>• Areas disturbed during the construction activities and rehabilitated must be closely monitored for a period of at least two years to ensure the establishment of any re-vegetated area.</li> <li>• Remove and control all alien woody plant species that may appear during the operational phase.</li> <li>• Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.</li> <li>• Ongoing alien plant control must be undertaken during the operational phase. An alien invasive management programme must be incorporated during operation.</li> <li>• Maintenance workers and guests may not trample natural vegetation and work should be restricted to dedicated roads, paths.</li> <li>• Guests and staff should be provided with information explaining different types of vegetation and sensitive species and why disturbance should be avoided, as well as rules regarding</li> </ul> | Ongoing throughout the operational phase            | ENP Management                                 |
| <b>Preventing spread of alien invasive species</b> | <ul style="list-style-type: none"> <li>• Plan an alien invasive plant work group that can carry out follow-up alien plant control for at least two years post road upgrading activities.</li> <li>• Ensure that any contractor appointed for road maintenance work can identify the relevant plants and are aware of the removal procedures.</li> <li>• ENP Management should develop a management and monitoring programme for alien and invasive species detailing basic information, actions to prevent the establishment of invasive plants and methods of removal of site during construction.</li> <li>• When using chemical methods to eradicate invasive alien vegetation, the application method as recommended by the manufacture must be followed.</li> <li>• Management measures to eradicate and control alien plants must be informed by ENP invasive species management program.</li> </ul>  | Throughout the operation phase of the upgraded road | ENP Management                                 |
| <b>Increased Road Kills</b>                        | <p>It is anticipated that the level of wildlife road kills on the newly tarred road shall increase once its operation commences. Measures to curb road kills and road accidents should include:</p> <ul style="list-style-type: none"> <li>• Install suitable road signs and conduct regular inspections for their presence.</li> <li>• Make use of materials that blend in well with the natural environment and which cannot be ripped out by elephants.</li> <li>• Install speed control devices like humps and speed limit areas throughout the road area and road sections crossing well established wildlife footpaths.</li> <li>• Where the upgraded road passes areas closest to water holes or springs, suitable warning signs should be installed and the speed limit set at 50 km/h.</li> </ul>  | Throughout the operation of the upgraded road.      | ENP Management<br><br>MC to install road signs |

|                                   |   |                                      |                |
|-----------------------------------|---|--------------------------------------|----------------|
|                                   | <ul style="list-style-type: none"> <li>The use of rumble strip over the sections of the road identified as wildlife crossing hotspots is not recommended.</li> <li>Conduct road safety awareness campaigns aimed at park officials and service providers on the database of ENP Management. The awareness should be conducted through park meetings and also disseminated through posters, Radios, TVs and leaflets.</li> </ul>   |                                      |                |
| <b>Protection of Fauna</b>        | <ul style="list-style-type: none"> <li>The precautionary measures on the protection of fauna as stipulated in Management Plan of ENP should be applied during the operational phase, e.g. no poaching, no hunting or trapping devices are allowed in the park.</li> <li>All staff and maintenance contractors must undergo an environmental induction course as well as faunal education and awareness programmes.</li> <li>Guests and visitors must be made aware of the value of fauna.</li> <li>No raw, wild-animal derived products such as meat, bones, organs and hides may be brought into or removed from the park.</li> <li>Education and awareness campaigns on faunal species and their habitat are recommended to help increase awareness, respect and responsibility towards the environment for all staff.</li> <li>Disturbance of birds breeding and foraging in the area should be minimized.</li> <li>No plant, animal, wildlife or any natural or cultural items may be removed from the park without permission. To cut, damage, destroy or be in possession of any plant or part thereof, including dry wood or firewood is a serious offence. Importing of any specimen of an alien or listed invasive species into a national park is prohibited.</li> <li>A tarred road through the park has the potential to attract more advanced criminal activities in the park. Criminals will be able to move faster using the tarred road hence posing a threat to the security of the park.</li> <li>Management must ensure that increased poaching, illegal hunting of wild game, harvesting of forest products, etc. do ensue from the upgraded road.</li> </ul> | Throughout the operation of the road | ENP Management |
| <b>Wetland &amp; watercourses</b> | <ul style="list-style-type: none"> <li>In the event of any maintenance work on the upgraded road, the appointed contractor must ensure that refuelling and servicing of construction vehicles must not be done in watercourses but at least 200 m away.</li> <li>The appointed contractor shall ensure that a method statement is prepared prior to maintenance work to ensure that excessive quantities of sand, silt and silt-laden water do not enter watercourses.</li> <li>Appropriate measures, e.g. erection of silt traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken.</li> <li>Plan monitoring during the operational phase to ensure that the construction footprint is adequately rehabilitated.</li> <li>During maintenance or emergencies in areas that slope toward wetlands, sediment barriers must be installed along the edge of the maintenance activity as necessary to prevent sediment flow into wetlands.</li> <li>Monitoring should be done to ensure that sediment pollution is timeously addressed. Establishment of alien invasive species within the areas affected by the construction must be addressed as soon as possible.</li> <li>Road maintenance activities should not take place within watercourses or buffer zones, nor should edge effects impact on these areas.</li> </ul>   | Throughout the operational phase     | ENP Management |



|   |  |  |  |
|---|--|--|--|
|   | <ul style="list-style-type: none"> <li>• Ensure that operational activities do not impact on rehabilitated or naturally vegetated areas.</li> <li>• Regular independent water quality monitoring should form part of operational procedures in order to identify pollution.</li> <li>• Control of waste discharges and do not allow dirty water from operational activities to enter the watercourses.</li> <li>• Drip trays must be utilised during repairs and maintenance of all machinery. The depth of the drip tray must be determined considering the total amount / volume of oil in the vehicle. The drip tray must be able to contain the volume of oil in the vehicle.</li> </ul>   |  |  |
| <b>Poor Road Maintenance and Upkeep</b> | <p>The main causes for road accidents are reckless driving, defective vehicles, drunken and unexperienced or nonqualified drivers. To enhance safety and ensure longevity of the upgraded road, these management measures are proposed:</p> <ul style="list-style-type: none"> <li>• Carry out routine road maintenance by attending to cracks, potholes and clearing of vegetation overgrown within the road reserve.</li> <li>• Regular inspection of road signs and replacing damaged road traffic signs.</li> <li>• Attending to any complainants received from road users.</li> <li>• Litter accumulation along the road side must be regularly picked up.</li> <li>• Waste from road maintenance activities must be disposed of in a responsible manner.</li> <li>• Continue to raise awareness on proper road use by park personnel, service providers and tourist.</li> <li>• Mitigation measures recommended for the construction phase should be applied whenever major road maintenance work is conducted.</li> </ul> | Check road status at least monthly           | ENP Management or the party hired to carry out maintenance |
| <b>General and Hazardous Waste</b>      | <ul style="list-style-type: none"> <li>• General and hazardous waste generated the operational phase of the road must be handled by following the measures recommended for the construction phase.</li> </ul>  | Ongoing throughout                           | ENP Management   |
| <b>Decarbonisation initiatives</b>      | <ul style="list-style-type: none"> <li>• Already, the use of plastic bags within the national plastic has been banned which is a step in the right direction as far as decarbonisation initiatives are concerned.</li> <li>• Consider to incentivise the use of vehicles with reduced exhaust emissions such as hybrid vehicles and fully electrical powered vehicles – where guests using such vehicles pay considerable less in park fees than those using conversional vehicles.</li> <li>• Encourage service providers delivering goods and services to the park using heavy duty trucks to use trucks powered by diesel with a low sulphur content – 50 ppm or less). This should apply to all tour operators.</li> <li>• Refuse entry into the park to guests or service providers with vehicles releasing excessive fumes or making excessive noise.</li> </ul>   | Ongoing throughout the operation of the road | ENP Management   |

## 5.5 ENVIRONMENTAL CODE OF CONDUCT

To improve its overall environmental compliance measures, a set of Environmental Code of Conduct are recommended and presented in Table 7, below: All employees should be given an induction which covers the code of conducts for the environment. Clients visiting the construction activities including subcontractors hired to perform certain functions as well as any visitors entering the road construction area are expected to be made aware of such code of conduct.

In terms of this Environmental Code of Conduct, the Site Manager employed by Main Contractor is authorized to issue warning and to discipline any person who transgresses environmental rules and regulations.

Table 7: Environmental Code of Conduct

| ENVIRONMENTAL CODE OF CONDUCT   |
|---|
| <b>HEALTH AND SAFETY GUIDELINES</b>   |
| <p><b>Water:</b></p> <ul style="list-style-type: none"> <li>• Do not drink water from any taps used for watering plants and trees at the campsite.</li> <li>• Only drink water supplied by the company or purified water.</li> <li>• Signage should be posted on the construction campsite where contaminated water occurs.</li> </ul> <p><b>HIV/AIDS Virus:</b></p> <ul style="list-style-type: none"> <li>• Take the necessary precautions to avoid contracting the HIV/AIDS virus</li> <li>• Take the necessary precautions to avoid contracting STDs and other illness</li> </ul> <p><b>Restricted Areas:</b></p> <ul style="list-style-type: none"> <li>• Do not enter an area marked as restricted or demarcated as dangerous without permission.</li> <li>• Areas that are out of bound should not be entered, i.e. fuel storage area, borrow pits, etc.</li> <li>• Do not enter an area marked 'PPE required' unless wearing suitable PPE.</li> </ul> <p><b>Housekeeping Rules:</b></p> <ul style="list-style-type: none"> <li>• The use of drugs while is strictly forbidden.</li> <li>• Coming to work while intoxicated is strictly forbidden.</li> <li>• Willful lettering is not allowed and offenders should be reprimanded.</li> <li>• Possession of guns and dangerous weapons at campsite or at worksite is strictly forbidden.</li> <li>• Not wearing clean and tide PPEs is strictly forbidden.</li> <li>• Urinating anywhere other than at designated places on the campsite or construction sites is not allowed.</li> </ul> |
| <b>FAUNAL AND FLORAL MANAGEMENT GUIDELINES</b>  |
| <p><b>Faunal Guidelines:</b></p> <ul style="list-style-type: none"> <li>• No domestic animals (dogs and cats) are allowed on the campsite.</li> <li>• No food items should be left around to attract animals, birds and or insects. Leftover food items must be placed in waste bin with lids such that animals do not gain access.</li> <li>• Hunting or poaching of wild animals is strictly forbidden.</li> </ul>  |

## ENVIRONMENTAL CODE OF CONDUCT

### Floral Guidelines:

- Any vegetation at the campsite or construction sites should be protected and not damaged.
- Harvesting of firewood in the park is prohibited.
- Picking of mopane worms from any trees within the park premises is strictly prohibited.

### GUIDANCE WITH RESPECT TO DISPOSAL OF SOLID AND LIQUID WASTE

- Train employees on the various types of waste: general waste and hazardous waste
- Train employees on how to identify waste bins, drums or bags for the different types of waste
- Train employees not to dispose hazardous waste in the bins or skips intended for general waste.
- Educate employees to appreciate the importance of not littering or throwing away waste anywhere on the park premises, not to throw waste in the field or along the roads.
- Under no circumstances should waste be buried on site.
- Waste in bins should be disposed of at regular intervals and the bins cleaned and the surrounds kept clean and tidy.

### GUIDELINES WITH RESPECT HAZARDOUS WASTE

- Hazardous substances such as used oil filters, old batteries, used oil, solvents, etc. should not be discharged into natural water streams or buried anywhere on the campsite or at the road construction sites.
- Any accidental spills of hazardous substances must be immediately contained and corrective action taken. Follow the spill mitigation measures in the event of a spill. Procedure.
- Under no circumstances may hazardous substance waste be allowed to soak into the soil. Where this happens the whole soil must be scooped out and treated as hazard waste.
- Any leaks or spillage of hazardous substances, unhygienic conditions at the ablution facilities must be immediately reported and corrective measures taken.

### GUIDELINES WITH RESPECT TO ENVIRONMENTAL RELATED COMPLAINANTS

- Any complaint reported by any stakeholder with respect to working conditions, noise, dust, violations of road regulations, pollution or any other harmful or dangerous condition must be recorded, investigated and corrective action taken.
- Where warranted, feedback should be provided to the complainant.

## 6 CONCLUSIONS

The mitigation measure provided in the EMP, if properly implemented will help to minimise adverse impacts on the environment during the construction, operation and rehabilitation phases. Where the impacts occur, immediate action must be taken to reduce the escalation of effects associated with such impacts. To ensure the relevance of this document to the specific stage of the project, it needs to be reviewed throughout all the phases.

The EMP should be used as an onsite reference document during all phases of the project, and auditing should take place in order to determine compliance with the EMP for the site. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Monitoring reports must be submitted to the office of EC every six months during the construction phase for the future renewal of the Environmental Clearance Certificate.